Sounds of Learning The Impact of Music Education

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September 1, 2005

Dear Friends:

Music education is one of the cornerstones of a well-rounded and quality education. For much of the 20^{th} century, children schooled in U.S. public schools had access to quality, sequential music education. It was integral to an education that grounded students in skills for productive work and lives.

In the last decades of the 20th century, music education came under threat and was marginalized in the school curriculum. This threat was realized in the elimination of thousands of programs and substantial cutbacks of qualified and certified music educators.

It is believed that music education is a subject with intrinsic cultural and artistic value and a skill-based activity that nurtures developmental and cognitive aspects of every child. However, only recently have the benefits of active participation in music been quantified through scientific research. Also only recently, new information provided by this research has informed the education policy debate.

This growing body of research data has helped define music education's benefits as part of a complete education and has provided baseline arguments to move music education back into the core curriculum. The latter remains a long-term goal for genuine renewed access to music education for every child in every school. In the short term, these research-based arguments have helped restore programs, stemmed the tide of some program cut backs and underpinned arguments for music and art education in the language of education policy and legislation.

The "Sounds of Learning" initiative seeks to expand the body of research about music education's intrinsic and extrinsic benefits. It is hoped that the initiative will yield new knowledge for the field of music education. Ultimately, we look to these research outcomes along with other research to fuel ongoing policy debates about what constitutes a meaningful and quality education for our nation's children.

The Foundation wishes to express its deepest appreciation to the skilled and inspiring Steering Committee of the "Sounds of Learning" initiative and to our partnering supporters, the Fund for Improvement of Education at the U.S. Department of Education and the Grammy Foundation. It also expresses deep gratitude to our founding and ongoing affiliate, NAMM, the International Music Products Association.

Sincerely,

Mary Luehrsen Executive Director

International Foundation for Music Research

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FOREWARD

Kristen Madsen Grammy Foundation

The mission of the GRAMMY Foundation is to cultivate an awareness, appreciation and advancement of the impact of music on American culture. In our efforts to achieve that objective, the Foundation has developed a wide range of music education and advocacy programs. Historically, the importance these programs—and music education programs nationwide—has been asserted in large part through passionately articulated anecdotal evidence of the positive impact of music education. The Sounds of Learning Project endeavors to sponsor and collect statistically significant evidence on the perceived positive benefits of music education. Utilizing a consistent and systematic evaluation process to reveal actual causes and links from the impact of music education, an expanded repository of research will be available on the subject.

Developing a blueprint of all the results that derive from music education will not only validate effective music instruction already established and inspire the creation of innovative curricula, but also inform the dialogue with policy makers and funding providers of education programs nationwide. The GRAMMY Foundation is proud to be a partner with the International Foundation for Music Research in funding the Sounds of Learning project.

1.

THE SOUNDS OF LEARNING PROJECT

Donald A. Hodges

The University of North Carolina at Greensboro

Sounds of Learning: The Impact of Music Education is a major research initiative designed to examine the roles of music education in the lives of school-age children and to expand the understanding of music's role in a quality education. Sounds of Learning (SoL) is an initiative of the International Foundation for Music Research (IFMR), with additional funding provided by the Fund for Improvement of Education from the U.S. Department of Education and the Grammy Foundation. A major goal of the project is to examine music education's influence on:

- (a) Achievement and success in school,
- (b) All aspects of a child's growth and development,
- (c) The uses and functions of music in daily life, and
- (d) Home, school, and community environments.

A unique feature of this project is that significant funding is available to support research

designed to advance our understanding of the impact of music education.

SoL is guided by the following Steering Committee:

- Edward P. Asmus, Professor of Music Education and Associate Dean, University of Miami Frost School of Music
- Paul A. Haack, Professor of Music Education, University of Minnesota School of Music
- Donald A. Hodges, Covington Distinguished Professor of Music Education; Director, Music Research Institute, University of North Carolina at Greensboro School of Music
- Mary Luehrsen, Executive Director, International Foundation for Music Research Kristen Madsen, Senior Vice President, The Grammy Foundation
- Debra S. O'Connell, Posdoctoral Fellow, University of North Carolina at Greensboro School of Music

Patricia E. Sink, Graduate Advisor for Music Education, University of North Carolina at Greensboro School of Music

David J. Teachout, Chair, Division of Music Education, University of North Carolina at Greensboro School of Music

Biographical descriptions of Steering Committee members can be found in Appendix A.

During an initial organizational meeting, the Steering Committee organized the Sounds of

Learning project into three phases, with the following timeline:

Phase 1

—2005—
February 11-13: initial Steering Committee meeting
March 3: Phase 1 Request for Proposals (RFPs) announced
May 1: announcement of research award recipients
July 1: SoL Status Report drafts due
August 1-3: second Steering Committee meeting
September 1: release of first draft SoL Status Report and Database; dissemination to selected reviewers for review and commentary

Phase 2

September 1: Phase 2 RFPs announced

October 1: deadline for reviewers to return critiques

November 1: deadline for submission of Phase 2 RFP proposals

December 3-4: third Steering Committee meeting

December 5: announcement of Phase 2 RFP recipients; release of second draft of *SoL Status Report* soon thereafter

—2006—

January 3: Final Reports of Phase 1 research projects due

Feb. 18-19: Steering Com. meeting and Research Awards Conference with Phase 1 & 2 RFP recipients

Phase 3

September 1: Phase 3 RFPs announced

December 1: Final Report of Phase 2 research projects due

—2007—

February: publish revised *SoL Status Report*, including a compendium of all funded research

February: Sounds of Learning national summit, Washington, D.C.

PHASE 1

Phase 1 included the previously mentioned Steering Committee meeting, announcement and contracting for initial research proposals, and release of the *SoL Status Report* and Database.

Phase 1: Request for Proposals

Three Requests for Proposals (RFPs), conceived as short-term research projects, were advertised during March 2005. The application deadline was April 15 and several proposals were received for each of the following RFPs:

RFP1: The Impact of Participating in School Music Programs on Standardized Test Results

Proposals are requested to conduct a short-term quantitative research study of the impact of participating in high or low quality school music programs on standardized test results. Specifically, the proposed study should be designed to investigate the relationship between fourth- and eighth-grade students' end-of-grade test scores and their participation in school music programs recognized as either high or low quality programs. The successful proposal should include a description of: (a) methods by which schools will be differentiated in terms of quality music education programs, (b) process of obtaining end-of-grade test scores as well as other data necessary to produce valid and generalizable results, and (c) methods of data analysis. Additionally, the proposal should include a timeline and a budget, and evidence of prior experiences in executing the procedures to complete the project successfully. The final report is due January 3, 2006.

RFP2: The Importance of Music Education in the Lives of Teenagers

The purpose of this project is to determine the importance of music education in the lives of teenagers based on a content analysis of 1,500 essays. Collected for another project, these essays were written by middle and high school students from all over the United States as they

expressed their thoughts and feelings on music education. In particular, we are interested in making connections to the four primary themes of: (a) achievement and success in school, (b) all aspects of a child's growth and development, (c) the uses and functions of music in daily life, and (d) the home, school, and community environments. The proposal should indicate how the researcher intends to conduct the analysis, and should include a timeline and a budget; supporting materials should provide evidence of prior experience using content analysis techniques. The final report is due January 3, 2006.

RFP3: The Impact of a Quality Music Program on K-12 Education

The purpose of this project is to perform short-term qualitative research within a school district recognized for its musical quality. We are interested in obtaining a creative proposal that can identify the primary student achievement and success outcomes caused by music. The study would look at the breadth of possibilities of how music impacts children in elementary and secondary schooling as exemplified in one school district with a quality music program. The study should provide a sorted list of the major outcomes that can be used to focus future research. The supporting qualitative evidence for each outcome's rating must be provided. Summer 2005 is to be used for planning the implementation of the study. The research is to be implemented during Fall 2005. The final report is due January 3, 2006.

Phase I Awards

Christopher M. Johnson, Professor of Music Education and Music Therapy from the University of Kansas, was chosen to conduct RFP1: *The Impact of Participating in School Music Programs on Standardized Test Results*. Patricia S. Campbell, Donald E. Petersen Professor of Music at the University of Washington, was selected to conduct RFP2: *The Importance of Music Education in the Lives of Teenagers*. Final reports on these two projects are due January 3, 2006.

Although several proposals were received for RFP3: The Impact of a Quality Music Program on K-12 Education, ultimately it was decided not to fund this project.

Phase 1: SoL Status Report and Database

The second part of Phase 1 was to prepare a document that would provide the background and context for SoL. This Status Report is accompanied by a Database that will be described subsequently. Following the introductory chapter, the next five chapters (with their authors) are related to the main themes: 2: The Impact of Music Education on Academic Achievement (Hodges & O'Connell), 3: The Impact of Music Education on All Aspects of a Child's Growth and Development (Teachout), 4: The Impact of Music Education on the Child's Self (O'Connell), 5: The Uses and Functions of Music as a Curricular Foundation for Music Education (Haack), and 6: The Impact of Music Education on Home, School, and Community (Asmus). The purpose of these chapters is to review the relevant literature and to discuss implications for learning, for future research, and for policy makers. These review chapters are followed by 7: A Research Agenda to Investigate the Impact of Music Education (Hodges).

A unique feature of the review chapters is that details of relevant research studies are not included in the paper itself, rather they may be found in a Database available at http://www.uncg.edu/mus/soundsoflearning.html or on the IFMR website at www.music-research.org. The advantage of this approach is that the review chapters are focused more on broad conclusions than on supportive detail. This should facilitate understanding for policy makers and others who are interested in the broad conclusions of relevant research. Those who are interested in the specific aspects of particular research studies can find those details in the Database.

The SoL Database is a fully searchable relational database that includes a complete citation for each study (author(s), title, journal, volume, issue, pages), as well as an abstract, and coding with respect to the four major areas of emphasis (e.g., achievement and success in school, etc.). Abstracts have been prepared by chapter authors, their research assistants, or by Dr. O'Connell. Published journal articles and unpublished dissertations are included; data entry is ongoing.

Chapter 7: A Research Agenda to Investigate the Impact of Music Education synthesizes the findings of the previous five chapters. From that synthesis, a research agenda was developed to provide a broad overview of research needed to improve our understanding of the impact of music education. Finally, seven Requests for Proposals were created based on the SoL research agenda. These RFPs are being presented to the music education research community in an effort to recruit experienced researchers to conduct specified studies. Funding from the IMFR, Department of Education, and Grammy Foundation will support these efforts.

PHASE 2

Based on the *SoL Status Report* and Database, and particularly the research agenda, a second round of RFPs was announced on September 1, 2005. Proposals should be submitted by November 1 and research award recipients will be announced December 5, with most final reports due December 1, 2006. A few projects may be given longer timeframes to allow for longitudinal studies or data gathering that may take more time. For complete details, see the concluding section of Chapter 7 or go to http://www.uncg.edu/mus/soundsoflearning.html or http://www.music-research.org.

Concurrent with the recruitment of researchers to conduct studies from Phase 2 RFPs is the dissemination of this document for review and commentary by a panel of selected music educators, including:

- David Circle, President of Music Educators National Conference: The National Association for Music Education; Coordinating Teacher for Blue Valley (KS) School District
- Charles A. Elliott, Director of the School of Music, University of Southern Mississippi
- Clifford K. Madsen, Robert O. Lawton Distinguished Professor of Music, Coordinator of Music Education/Music Therapy/Contemporary Media, Florida State University
- Gary E. McPherson, Zimmerman Professor of Music Education, University of Illinois Wendy L. Sims, Director of Studies in Music Education, University of Missouri

Peter R. Webster, John W. Beattie Professor of Music Education and Technology, Associate Dean for Academic Affairs and Research, Northwestern University

These experts were asked to provide independent oversight, to identify missing studies in the review chapters, suggest wording changes to more accurately reflect understandings on broad issues, and to nominate items for the research agenda. Suggested RFPs are also welcomed, and these may be added to the third round of RFPs (September, 2006). Their reviews will be included in the second draft of this document.

Following the submission of final reports, all research award recipients from Phases 1 and 2 will meet with the Steering Committee (February 18-19, 2006). This will be a time of information sharing of both completed and in-progress research. Ensuing discussions will focus on integrating this new information into the existing knowledge base as synthesized and analyzed in the SoL Status Report and Database. Also, the group will discuss topics to be included in Phase 3 RFPs.

PHASE 3

Phase 3 RFPs will be announced September 1, 2006. Phase 2 Final Reports are due December 1. Based on these completed studies, a new version of the SoL Status Report and Database will be prepared. This will include a compendium of all the funded research to date that not only provides complete details of the research projects, but also includes a synthesis of this

knowledge. Wherever appropriate, broad conclusions will be developed and an updated status report on the impact of music education will be made available. In particular, specific recommendations for policy makers will be emphasized. The compendium will be presented at a Sounds of Learning Summit to be held in Washington, D.C. in February 2007.

CONCLUSION

As stated at the outset, the primary purpose of the SoL project is to determine the impact of music education. Beyond this is the desire to provide policy makers with rigorous, data-based information that will inform decision making. Since the time of Lowell Mason in the early 1800s music educators have been engaged in nearly constant struggle to justify a rightful place for music in the school curriculum. Throughout that time there have been thousands of dedicated music educators who have impacted hundreds of thousands of children in profound and positive ways. Yet, too often music is still marginalized and rarely recognized for the powerful role it should play in a quality education. It would be naïve to assume that the publication of this document will solve all these problems. Nevertheless, there is strong belief that high-quality research, particularly research focused on core issues, will be a significant step forward in placing music in its rightful place in the curriculum.

2.

THE IMPACT OF MUSIC EDUCATION ON ACADEMIC ACHIEVEMENT

Donald A. Hodges and Debra S. O'Connell

The University of North Carolina at Greensboro

The central focus of this chapter is an issue that has been of considerable interest to many in the music education community and to the general education community as well. Phrased as a question, this issue is: What is the impact of participation in music education on academic achievement? On the surface there is a fairly straightforward answer: students who participate in music education frequently do better than their peers on many measures of academic achievement such as grade-point averages and standardized tests like the SAT or ACT. For example, using information from the National Center for Educational Statistics, Morrison (1994) reported that on a sample size of 13,327 high school sophomores those who participated in music reported higher grades in English, math, history, and science than those who did not participate in music.

However, closer examination of these and other data adds many caveats and qualifiers to this notion. Consider as just one example the fact that two researchers (Cox, 2001; Holmes, 1997) found that a possible explanation for apparent superior achievement is that music participants had higher academic achievement scores prior to enrolling in music studies. It is the purpose of this chapter to examine the research literature to arrive at a more nuanced understanding of this timely issue.

Unlike many of the topics reviewed in this *SoL Status Report* for which there is a dearth of literature, there is a significant body of research on the impact of music education on academic achievement. These studies are discussed in the following sections that form the organizational structure of this chapter: general academic achievement, reading achievement, mathematics achievement, integrated arts instruction, and background music. Following these sections will be brief discussions of the implications for learning, future research, and policy makers.

GENERAL ACADEMIC ACHIEVEMENT

A modest number of research articles or literature reviews have been concerned with the effects of music education on what has been called general academic achievement, so called because a variety of disciplines were involved. Academic achievement as measured in these studies usually involves reading and/or language arts and mathematics; occasionally science or other disciplines are included as well. In addition to grade point averages and teacher-designed assessments, the following standardized tests have been used in this body of research:

American College Test **Basic Skills Assessment Program** California Test of Basic Skills Comprehensive Tests of Basic Skills **Cornell Critical Thinking Tests** Florida Comprehensive Achievement Test Georgia High School Graduation Tests Iowa Tests of Basic Skills Kentucky Instructional Results Information System assessment scores Metropolitan Readiness Tests (New Jersey) Grade Eight Proficiency Assessment Scholastic Assessment Tests Stanford Achievement Test Stanford-Binet Intelligence Scale Texas Educational Assessment of Minimum Skills **Tests of Achievement Proficiency** Texas Assessment of Academic Skills Texas Assessment of Knowledge and Skills Torrance Tests of Creative Thinking Wechsler Intelligence Scale for Children

Wechsler Preschool and Primary Scale of Intelligence Wide-Range Achievement Test-III Woodcock Johnson Tests of Achievement

Standardized music assessments include;

(Colwell) Music Achievement Tests (Gordon) Primary Measures of Music Audiation (Gordon) Intermediate Measures of Music Audiation (Gordon) Music Aptitude Profile (Seashore) Measures of Musical Talents Watkins-Farnum Performance Scale

Subjects in these studies ranged from preschool through college students. Sample sizes ranged from fairly small (e.g., N = 42; Huang, 2004) to very large (N = 17,099; Cobb, 1997). A few studies included variables such as gender or race, but most did not. Musical experiences included traditional music education activities such as elementary general music or high school band, as well as special programs such as keyboard instruction. In a few studies, subjects were participants in general arts or extracurricular activities, not music *per se*. A wide variety of research designs and data analysis strategies were employed.

General Findings

A number of studies support the contention that students who participate in formal music education have higher academic achievement scores than students who do not participate in formal music education (Babo, 2001; Cardarelli, 2003; Cobb, 1997; Cox, 2001; Frakes, 1984; Huang, 2004; Linch, 1993; Miranda, 2001; Mitchell, 1994; Parrish, 1984; Schneider & Klotz, 2000; Trent, 1996; Underwood, 2000; Zanutto, 1997). Furthermore, being excused from nonmusic classes to attend instrumental lessons does not adversely affect academic performance (Corral, 1998; Cox, 2001; Dryden, 1992; Engdahl, 1994; Kvet, 1982).

Three selected studies are briefly reviewed here as illustrations of this type of research. Cardarelli (2003) investigated the effects of instrumental music instruction on standardized test performance of third-grade students. Students were divided into two groups: those participating in an instrumental music training program and those not participating. The music training activity was designed for inner city students who could not financially afford to take music lessons. She found statistically significant differences between the mean scores of the two groups, with a positive effect of the music program on the students' achievement levels.

Schneider & Klotz (2000) examined the relationship between enrollment in music performance classes and athletic extracurricular activities on academic achievement. Three hundred forty six subjects were divided into three groups: musicians (band or choir), athletes, or non-participants. All three groups were statistically equivalent in fifth and sixth grade. During seventh, eighth, and ninth grades the musicians achieved significantly higher academic achievement scores than the athletes but did not score higher than the non-participants. The authors noted that the musicians showed a tendency to maintain stabilized scores while the athletes and non-participants groups' scores dropped.

Using records from two area high schools, Trent (1996) determined that those high school seniors who had participated in instrumental music programs from sixth through 12th grades scored significantly higher on standardized tests of language arts and math than their counterparts who had participated in non-music extra-curricular activities or who had not participated in extra-curricular activities. Several authors who conducted literature reviews arrived at conclusions supporting these three studies: those who participate in music have higher academic achievement than those who do not (Arnett-Gary, 1998; Shobo, 2001; Yoon, 2000).

Not everyone, however, obtained such clear results. Two researchers found that music participants had higher achievement scores in reading but not math (Dryden, 1992; Neuharth, 2000). Kluball (2000) found that the study of instrumental music was significantly related to

mathematics and science tests but not to language arts, social studies, writing and the SAT verbal and mathematics tests. Other researchers have either found no significant difference in the academic achievement of music participants and other students (Haanstra, 2000; Holmes, 1997; Sprouse, 1971) or identified alternative explanations for their apparent superiority (Cox, 2001; Rossini, 2000; Schneider & Klotz, 2000; Shadd, 2002). In reviewing the literature, McIntyre & Cowell (1984) found that findings were unclear and often contradictory.

Only five experimental studies have been identified that tested the effects of music instruction on academic achievement. Three of the five obtained results indicating that music instruction did have a positive effect on academic achievement. Olson (2003) affirmed parallel reading and math concepts through Kodaly music instruction with first, second, and third grade students. Female students at all three grade levels improved math scores and males at the first and second grades improved reading scores. Barr, Dittmar, Roberts, & Sheraden (2002) provided elementary students with 16 weeks of instruction for the improvement of listening skills in addition to music instruction. Results indicated improved academic performance. Hoffman (1995) compared fifth graders who received keyboard instruction (at the end of fourth grade) the keyboard students had higher scores on only one measure, a subtest of language mechanics. However, after two years of instruction (at the end of fifth grade), the keyboard students outperformed their counterparts on total language, 3 R's battery, concept of numbers, math computations, math applications, and total math.

In contrast to the positive effects on academic achievement found in the studies mentioned previously, Hines (2000) found that neither reading nor mathematics achievement was affected by the type of instruction students received. She had compared the effects of two types of

instruction—motoric music instruction (utilizing movement) and non-motoric music instruction (excluding movement) on the academic achievement of learning disabled students from kindergarten through ninth grades. Likewise, third, fourth and sixth grade students who received music instruction did not show improved academic performance over peers who did not receive similar music instruction (Legette, 1993).

The Relationship Between Music And Academic Achievement

A number of researchers have been interested in the degree to which music aptitude or music experiences are related to academic achievement. The literature is nearly evenly divided between those studies in which a high degree of relationship was reported and those in which a low or negligent relationship was found.

Using data from first and fourth graders, Lamar (1989) found a significant, positive relationship between music aptitude and reading and one that approached significance for math. Music aptitude was also highly related with academic achievement in eight to 12-year-old students (Johnson, D., 2000). Palos-Tuley (2003) found positive significant effects for academic achievement and the degree of involvement in the fine arts of Hispanic students in grades three, four, and five, involved in either: an intensive fine arts academy, a rotational fine arts program, or a minimal fine arts program. A positive relationship was found for those high schools whose band participated in concert festival and SAT scores (Johnson, P., 2000). For those bands that participated in concert festival, a positive relationship was found between level of difficulty of music and SAT scores, but not for festival ratings and SAT scores. Ciepluch (1988) determined that a significant relationship existed between the sightreading achievement of instrumental music students and reading and math achievement and GPA.

Contradictory results were reported by Drennan (1984), who found that a combination of reading, math, and IQ scores was not a good predictor of musical aptitude, and Barrett (1993) who determined that there was no correlation between music aptitude and academic achievement for disadvantaged six-to-eight-year-olds. Likewise, Hobbs (1985) obtained low positive correlations (r = .33) between music aptitude and scholastic aptitude, indicating that music aptitude and scholastic aptitude tests measure different aspects of cognition. Higher correlations were found between music aptitude and academic achievement (r = .56), although this still indicates only a moderate relationship. Two concerns are that the sample sizes were fairly small (n = 24 in each of first, second, and third grade classes) and levels of significance were not reported for the correlation coefficients.

Duke, Flowers, & Wolfe (1997) found that piano performance ability was unrelated to academic achievement and Laycock (1992) reported a low correlation between musical characteristics of students' original compositions and GPA. Haynes (1982) used a 10% random sample (12,343) of 123,400 high school students who took the ACT Assessment in 1980-81. She found that participation in instrumental music was not among the five independent variables that contributed most to the criterion variable (scores achieved on the ACT). The five contributing variables (high school GPA, years studied or planned to study in mathematics and natural sciences, rank in high school graduating class, and gender) accounted for 48% of the variance, while including all 17 variables for which data were gathered only accounted for approximately 50% of the variance. Finally, there was no difference in critical thinking scores among college music, business and nursing students (Money, 1997). There was a low correlation between critical thinking scores and GPA for music students, but not for business or nursing students.

READING ACHIEVEMENT

Reading is a key to successful academic achievement. Yet, according to the most recent national assessment, only 32% of the nation's fourth grade children are reading at or above grade level (NAEP, 2000). To counteract this situation, the government has allocated nearly \$4 billion for Reading First, program that aims to improve reading instruction for K-3 students (http://www.ed.gov/programs/readingfirst/nclb-reading-first.html). An early intervention program to help students acquire better reading skills should enable them to perform better throughout their school years and beyond (Snow, Burns, & Griffin, 1998).

Recently there has been an interest in determining whether music instruction would improve reading skills. As reading and language arts were frequently covered in the previous section on academic achievement, this section reviews the few studies that focused solely on the impact of music experiences on reading.

Preschool Children

Three intact classes of children, aged three to six, with developmental disabilities received two 25-minute music classes per week for six weeks (Stringer, 2004). Although their auditory comprehension and total language scores improved from pretest to posttest, they did not score significantly higher than the control groups.

Elementary School Children

Most of the literature has focused on elementary school children. First grade students who received either one or two years of Kodaly training had higher reading scores than controls (Huriwitz, Wolff, Bortnick, & Kokas, 1975). Nicholson (1972) concluded that students between ages six and eight categorized as slow learners who received music instruction had significantly higher reading readiness scores than students who received

no music instruction. Movsesian (1967) found similar results with students in grades one, two, and three.

This was in contrast to Lu (1986). She compared the reading performance of firstgrade students who received Kodaly-Orff music instruction with others who were given traditional reading instruction only and found no significant differences. In fact, a number of other studies failed to show any effect of music instruction on reading achievement.

Kindergarten students who received six weeks of music instruction involving locomotor movement activities while singing action songs did not perform any better than controls on a teacher-made picture-word recognition test in language arts (Montgomery, 1997). Twelve weeks of enhanced music curriculum did not improve reading achievement in 66 elementary students enrolled in an arts school (Bowles, 2003). Kemmerer (2003) compared students from two different school districts, one of which provided 17.5 minutes of general music classes per six-day cycle more than the other. Standardized reading and language test scores for fourth-graders, following four years of this curriculum (K-3), showed that the extra time spent in music did not result in superior performance.

The Relationship of Auditory Perception to Reading

It has seemed reasonable to a number of researchers that music instruction might improve auditory perception skills that, in turn, might impact reading abilities. Indeed, for the most part, research has supported this notion.

Music perception utilized auditory mechanisms related to reading as musical skills correlated significantly with phonological awareness and early reading skills in a group of four and five-year-old children (Anvari, Trainor, Woodside, & Levy, 2002). Also studying four and five-year-

olds, Lamb & Gregory (1993) found that pitch discrimination skills were correlated with reading performance. The important factor in this relationship is detection of pitch changes; timbre discrimination was not significantly related to reading. Using a small sample (N = 16) of nine and ten-year-olds, Barwick, Valentine, West & Wilding (1989) found a significant moderate relationship (r = .53) between tonal memory and reading age. These results were confirmed in a follow-up study with a larger sample (N = 40) and a slightly large age span (six to eleven years).

In a series of three studies, Atterbury (1985) found that reading-disabled children (ages 7-9) could discriminate rhythm patterns as well as controls, but were poorer in rhythm performance and tonal memory than normal-achieving readers. Beat competencies (finding the micro and macrobeats in a musical selection) of third and fourth-grade students were not a significant predictor of reading (Chamberlain, 2003).

Researchers had previously shown that adult musicians who received musical training before the age of 12 had a better memory for spoken words than those without musical training (Chan, Ho, & Cheung, 1998). Subsequently the same group tested this hypothesis in children ages six to 15 (Ho, Cheung, & Chan, 2003). Results confirmed the previous findings as those with musical training improved verbal memory (but not visual memory) more so than those who discontinued or never received such training.

In a meta-analysis of 24 correlational research studies, Butzlaff (2000) calculated a reliable, but low relationship between music instruction and standardized measures of reading ability (r = .17). In the six experimental studies, he calculated an even smaller effect for music instruction on reading. A similar meta-analysis was conducted by Palmarini (2000) for Reviewing Education and the Arts Project. He found little quantitative data to support the notion that the arts improve reading skills.

MATHEMATICS ACHIEVEMENT

According to the U.S. Department of Education, schools in the United States "are not producing the math excellence required for global economic leadership" (http://www.ed.gov/nclb/methods/math/math.html). The average math scores of fourth- and eighth-graders have improved slightly; however, 12th-grade math scores have not improved since 1996 (NAEP, 2000). Beginning in 2005, *No Child Left Behind* requires all states to measure students' progress in mathematics annually in third- through eighth-grade.

The subject of mathematics is generally taught in isolation from other subjects and often lacks any creative or artistic flair. Students often become bored and do not pay attention in class, resulting in lower test scores. However, there is a connection between music and mathematics, both subject areas use numbers, repeating patterns and ratios (Vaughn, 2000). Because of this connection it is possible that participating in music education can improve students' understanding of mathematics, thereby resulting in improved mathematics achievement scores. A large majority of research studies on music and mathematics show that there is some positive effect of music on mathematical achievement, however a few studies have found no effect. As with the section on reading achievement, the studies reviewed here are restricted to studies where the focus was on mathematics specifically and not on general academic achievement.

Preschool Children

Geoghegan and Mitchelmore (1996) investigated the effects of a music program on the mathematics achievement of preschool children. The researchers found that there was a difference in mathematics achievement between the music group and the non-music group. The group of children who were involved in the music program scored higher on the mathematics achievement test than the children who had not been involved in the music program and had a

limited musical background. Further analysis revealed that the difference in mathematics achievement may have been a result of the children's home musical background rather than the music program itself.

Elementary School Children

A two-year study by Gardiner et al. (1996) investigated the effects of a music and visual-arts curriculum on the academic achievement of first-graders. Students who participated in the arts curriculum had test scores below those of the non-arts curriculum students at the beginning of the school year; however, after seven months the arts curriculum students had higher scores on mathematics achievement. At the beginning of the following year, students were retested and the researchers found that the students who participated in the arts curriculum were still ahead of their peers in mathematics achievement. After a second year of treatment, the arts-curriculum students continued to have higher mathematics achievement scores. The researchers also found that the percentage of students at or above grade level in second-grade math was the highest for those students who participated in the arts curriculum for two years, less for those students who participate for only one year, and lowest for those students who did not participate in the arts curriculum.

Haley (2001) investigated the effects of participating in an instrumental music program (band or orchestra) on the academic achievement of fourth-grade children. The children were placed into three groups: Group A consisted of children who had studied an instrument prior to the introduction of band and orchestra in fourth grade; Group B consisted of children just beginning to study an instrument; and Group C consisted of children with no experience in instrumental instruction. Data indicated that students who had studied an instrument prior to fourth grade had higher scores in mathematics achievement than did students in the other groups. Rafferty (2003) investigated the effect of the Music Spatial-Temporal (MST) Math Program on mathematics achievement of second graders. Students who participated in the MST received piano lessons in addition to their regular classroom activities. No significant effects of the MST on the mathematics achievement of second graders were found.

Middle and High School Children

Whitehead (2001) examined the effect of music instruction (Orff-Schulwerk) on math scores of middle and high school students. Subjects were randomly placed into three groups: full treatment (which received music instruction for 50 minutes five times per week), limited treatment (which received 50 minutes of instruction once a week), and no treatment (which received no music instruction). After twenty weeks, the full treatment group showed a higher level of significant gain in mathematics than the other two groups. The limited treatment group showed limited mathematics improvement and the no treatment group had the lowest gain in mathematics improvement.

Effect of Duration of Music Study

A study by Rauscher and Zupan (2000) investigated the effects of classroom music instruction on spatial-temporal reasoning of kindergarten students. Students were assigned to one of two groups: keyboard instruction or no music. After four months of treatment, the keyboard group scored significantly higher on the spatial-temporal tasks than the no music group. The researchers found that after eight months of treatment, the keyboard group still scored significantly higher than the no music group and the difference between groups was much greater.

Cheek (1999) examined whether the type of music training is related to the mathematic achievement levels of eighth-grade students. In addition to collecting student data on the Iowa

Tests of Basic Skills (ITBS), Cheek surveyed students about their music background including: type of musical instrument, number of years of school music lessons, number of years of private lessons, and demographics. No significant difference was found between the ITBS mathematics scores of students who did and did not receive private music lessons. However, students with two or more years of private lessons had a significantly higher mean mathematics score than students with no private lessons. Furthermore, students who had keyboard lessons had significantly higher ITBS mathematics scores than students who had music lessons on other instruments.

INTEGRATED ARTS INSTRUCTION

Mortimer Adler (1982) is illustrative of many educational philosophers who have felt that the arts should play a central role in education. Educating students through the arts is felt to be critical for the development of a whole person (Smith, 1984). Eisner (2002) has outlined a number of ways this can be done, including (a) the integration of the arts into specific projects (e.g., a history project), (b) integration within the arts, such as comparing rhythm in music and the visual arts, (c) working out a specific theme from artistic or no artistic perspectives, and (d) problem solving through multiple perspectives.

This process begins quite naturally in infancy and early childhood as learning experiences are holistic and integrated, not separated into specific domains. Consider, for example, children's television programming. Shows such as Sesame Street incorporate music along with a wide variety of arts into the informal learning experience. Several curricular models have been developed with an arts integration approach. For example, the A+ Schools program "combines arts integration, continuous, whole school professional development, and the use of statewide

support networks for teachers and administrators to implement a state's mandated curriculum and meet accountability standards" (e.g., http://aplus-schools.uncg.edu/).

Integrated Instruction and Reading

Many music educators have called for music to be integrated into the instruction of the whole child (Adair-Hauser, 1994; Fox, 2000; Lonich, 1994; Trimble, 1994). Unfortunately, there is very little research that identifies the specific effects of music in an integrated approach. Most of the research literature involves integrated instruction involving more arts than just music. Recognizing that in these cases it is impossible to separate out the specific contributions of music, the results are generally favorable for language instruction. Fourth grade students who participated in SAMPLE (Suggested Activities of Music and Poetry for Language Enrichment) outperformed students in a traditional class on language mechanics and total language (Hudspeth, 1986). Matthews (2001) determined that integrated arts (dance, music, drama, and visual arts) instruction improved reading performance for fifth, but not third or fourth grade students.

Three studies that integrated music and not the other arts provided contrary evidence to the foregoing. In one study, first graders received music instruction integrated with whole language instruction (Miller, 1995). No significant differences were found between the music-integrated classes and other control classes. Fourth and sixth grade students received music or no-music language arts instruction (Weisskoff, 1981). The music group studied lyrics and played language games with lyrics from popular/rock music, but there was no significant effect on task performance. In another study, one intact fifth grade class received integrated music and reading and the other had no music integration (Andrews, 1997). Interestingly, all three studies reported an improvement in motivation or attitude in spite of the lack of effect on language arts skills.

Several have investigated the effects of music integrated into instruction of a foreign language. Music instruction was integrated into elementary school Grade 2 French immersion classes in the form of eight weekly units of five 15-minute music lessons (Lowe, 1995). The control group did not have music incorporated into French lessons but did receive weekly 30minute music lessons. The integrated music class did better in oral grammar and reading comprehension French tests. Using a technique called "suggestopedia" which incorporates music, college students learned German more effectively than a control group (Gassner-Roberts & Brislan, 1984); however, it is not possible to separate the specific effects of music from the overall "suggestopedia" approach. Music was used to teach Spanish to preschool Spanishspeaking children, but no significant differences were found in test scores between experimental and control students (Dominguez, 1991).

Integrated Instruction and Mathematics

The connection between music and mathematics extends as least as far back as the Pythagorean experiments in 6th century BC. In more recent times, many have suggested the use of music in teaching mathematics (Church, 2001; Dudley & Pecka, 1994; Johnson & Edelson, 2003; Rothenberg, 1996; Shilling, 2002; Tips for Beginners, 1991). Some of these suggested programs are quite innovative; for example, Stevens, Sharp, & Nelson (2001) describe a program that has students drumming ratios such as 6:8 in 6/8 meter. Regardless of how creative these suggestions are however, they are just that—suggestions, and there are very few research studies that confirm their enthusiasm.

As with reading, music is sometimes included in an arts integration approach when teaching math such that it is impossible to determine music's unique contributions. Omniewski (1999) compared three groups of second graders: an arts infusion group (music, art, dance, and drama),

a manipulatives group, and a traditional group. There were no significant differences in math achievement among the three groups, though the arts infusion group had the highest gain scores.

Gregory (1988) compared six classes of third graders who were taught math via music to six classes taught math via traditional methods. The music-integrated classes showed significant gains compared to the control groups. Traver (1993) compared the use of music and manipulatives in teaching math to at-risk students. Results were inconclusive because of the high drop-out rate and brief instructional time. Madsen (1981) did not integrate music into math instruction. Rather, he compared the use of televised music lessons as a contingency for correct math responses to the receipt of books and found that both reward systems were effective.

Integrated Music Instruction on Other Subjects

Seventh and eighth grade African-American and Latino students were taught social studies using art, music, poetry, collaborative learning and role playing (Konrad, 1999). Students receiving this experimental treatment achieved higher test scores in social studies. Researchers also examined the effects of integrated music instruction on the study of U. S. history (McTeer & Bailey, 1980). While one group of senior high school students was taught using a traditional lecture-discussion method an experimental group listened to and analyzed popular music that dealt with such topics as aging, assassination, civil rights, crime, drugs, death, ecology, nuclear power, Vietnam, and the women's movement. After five weeks there was no statistically significant difference in either attitudes or knowledge between the two groups, although gain scores were greater for the music group.

BACKGROUND MUSIC

Background music is defined as any music played while the listener's attention is focused on a task or activity other than listening to music (Radocy & Boyle, 1988). Over the past few decades, background music has become more and more prevalent in our society. Background music is commonly used in grocery stores, restaurants, and shopping malls to increase sales, and is often used in doctors' offices to relax or calm patients. Some students claim that they are able to study and learn more effectively with music in the background, while others claim that the music is more of a distraction. There have been quite a few studies that examined the relationship between background music and academic achievement of college students (Hardie, 1990; Haynes, 2003; Husain et al., 2002; Manthei & Kelly, 1999; Oliver, 1996; Rauscher et al., 1995; Steele et al., 1997; Steele et al., 1999; Stough et al., 1994); however, less research exists among elementary, middle, and high school students. Researchers studying the effects of background music on the academic achievement of school age children have obtained mixed results.

Effects on Reading/Language Arts

Carlson et al. (2004) examined the effects of background music and relaxation on the reading performance of third-grade students. Students, who participated in this study, sat in a vibroacoustic music chair, which allowed students to feel the vibrations of the music, while completing the reading-based tasks. The results of the study showed a statistically significant positive impact for both sight-word recognition and reading comprehension. There was no significant increase for oral reading accuracy. Furthermore, the researchers stated that all students who were reading below grade level at the beginning of the study improved their performance to grade level or higher.

Researchers investigated the effects of background music on spelling word retention of elementary school students (Anderson et al., 2000). They found that spelling test scores and

report card grades improved after listening to background music. The researchers concluded that the music enabled the students to relax, concentrate, and visualize the spelling words.

Hallam (2002) examined the effects of background music on story writing of fifth- and sixthgrade students. Students were divided into three groups: calm music, exciting music, or no music. After completion of the story writing, the students were asked whether they were aware of the music, if they liked it, if they thought it helped them, and how it made them feel. The researcher found that writing scores for the calm music and no music groups were similar, while writing scores for the exciting music group were significantly lower than scores in the other two groups. Additionally, children in the exciting music group spent more time off-task and asked more non-work related questions than students in the other two groups. Results of the questionnaire showed that childrens' perceptions of how music affected their work were often incorrect. They perceived the music they liked as helpful, and music they did not like as distracting.

Dawson (2003) examined the effects of four different auditory background conditions on the reading achievement of seventh-grade students. The four auditory conditions included instrumental music of Mozart, instrumental music of Yanni, instrumental music of Pink Floyd, and silence. The researcher found a significant effect for vocabulary, comprehension, and total reading ability when the auditory background condition consisted of listening to the instrumental music of Mozart or the auditory condition of silence.

Effects on Mathematics

Hallman and Price (1998) investigated the effect of background music on behavior and mathematics achievement of children with emotional and behavioral difficulties. All of the children in the study were between nine- and ten-years old and attended a school for children with emotional and behavioral difficulties. The researchers found that background music of a "calming nature" significantly improved math performance and significantly decreased rule breaking behavior of children with emotional and behavior difficulties. Additionally, the researchers found that the "calming music" had the greatest effect on children who had hyperactive behaviors.

Fioranelli (2001) examined the effect of background classical music on mathematics problem solving skills of third grade students in a computer lab setting. Classical music played in the background during the treatment group's computer lab sessions, while no music played during the control group's sessions. Fioranelli found no significant differences between the mathematics problem solving skills of third grade students who had listened to classical music and those who did not.

Attwell (1988) examined the effects of background music with subliminal auditory stimulation on math achievement and attitude of eighth-grade students. A taped subliminal auditory message "Math can be fun and easy" (Attwell, 1988) was embedded in a music ask at 10db below the music level and repeated every ten seconds. Results from the math diagnostic test and attitude scale revealed no significant effects of background music on math achievement or attitude of eighth-grade students.

Effects on Science

Davidson and Powell (2001) examined the effect of easy-listening background music on ontask performance of a fifth-grade science class. A significant increase in on-task performance was found for the male subjects and for the total class. Although there was not a significant increase in on-task performance for the girls, the researchers believed that this was due to the ceiling effect. The on-task performance of girls in the classroom prior to the treatment was very high (99%), slightly higher during the treatment (99.4%), and slightly lower after treatment (98.7%).

Smith and Davidson (1991) investigated the effects of background music on academic achievement of seventh-grade students. The students were divided into one of four conditions (rock music, classical music, easy listening music, or no music) while studying the earth-sun relationship. The researchers found no significant differences in the academic achievement of seventh-graders among the four background conditions.

IMPLICATIONS FOR LEARNING

Considering this body of research literature as a whole leads to a mid-position on the effects of music on academic achievement, regardless of whether it is specifically music instruction, music integrated with other disciplines, or background music. That is, at one extreme the data do not support the contention that music will necessarily improve academic performance and at the other extreme there is certainly no basis for saying that music instruction has no effect on academic achievement. Human learning is such a complex phenomenon that any simplistic explanation such as these must be rejected. Therefore, *some* music experiences have a positive impact on academic performance under *certain* circumstances. Although these excessive qualifiers are frustrating to teachers and administrators, the data simply do not support a more definitive statement.

Almost completely neglected in the research literature is the impact of the individual teacher. Simply testing the effects of a given form of music instruction without taking into account the characteristics of the teacher is short sighted. Logically, there is the possibility that excellent teachers who are enthusiastic and who relate well to students may make a greater difference in educational outcomes than the particular methodology used.

IMPLICATIONS FOR FUTURE RESEARCH

Although one may view the nearly ubiquitous statement "more research is needed" appended at the conclusion of almost every study to be a weak ending, there is definitely a sense in which this is true. Take the following as a comparison to the literature reviewed in this chapter: More than 100,000 research studies on reading have been published since 1996, with another 15,000 or so prior to that (National Institute of Child Health and Human Development, 2000). Based on these figures, the number of reports cited in this section seems meager indeed. Even if there are other relevant studies that are not included in this review, it is abundantly clear that we simply do not have anything close to enough research on this topic.

Quantity alone, of course, is not the only issue. Increasingly higher standards in research design and statistical analysis are called for. Larger sample sizes, random assignment of subjects to treatment groups, and longer treatment periods, would be especially helpful. Music education researchers should also be encouraged to collaborate with colleagues in psychology, sociology, and education.

IMPLICATIONS FOR POLICY MAKERS

To reiterate the point made previously, we must move away from simplistic notions regarding the impact of music education. Anecdotally, one of us (Hodges) can report that in a presentation to a statewide meeting of elementary school principals and superintendents, several attendees were quite upset to discover that playing music during test taking would not necessarily improve scores. Likewise, it has also been reported anecdotally that some parents have taken their children out of band because, while doing well in music, their math grades had not improved. Thus, one of the clear implications for policy makers is that music education is not a panacea that will cure all of education's ills.

Conversely, it is also not true that music education has no relevance for the overall academic achievement of students. Earlier reviews of this literature (Cutietta, Hamann, & Walker, 1995; Wolff, 1978) have recognized that even with limitations in this body of research there is support for the role that music can play in academic achievement. In a broader review of the effects of arts instruction on academic achievement, Eisner (1998) stressed the unique contributions arts instruction can make. Perhaps we would do well to return to a position once taken by the Music Educators National Conference when it was noted that the ancillary effects of music instruction instruction of music in the curriculum" (The Role of Music in the Total Development of the Child, 1977, 59). There is no reason why we cannot teach music for all the wonderful humanizing benefits it provides as well as for the potential for improving academic achievement.

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3.

The IMPACT OF MUSIC EDUCATION ON A CHILD'SGROWTH AND DEVELOPMENT

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The purpose of this chapter is to present a review of the research pertaining to the impact of music education on several aspects of a child's growth and development. The topics to be explored include: perception and cognition, motor development, emotional development, social development, at-risk students, and special needs students. The research cited was found by searching Dissertations Online, ERIC, Music Index, RILM, PsycINFO, Social Sciences Index, and the two handbooks of music teaching research (Colwell, 1992; Colwell & Richardson, 2002). Due to the space limitations of this document, the research cited in each topic area is a representative sample of the ideas found rather than a presentation of all existing research. Some topics have been studied less extensively over the years than the others and, as noted, are in need of continued research to be able to make specific recommendations for policy-makers. I will summarize the findings and will identify areas in need of future research.

PERCEPTION AND COGNITION

In this section, I will approach the topic of perception and cognition from two discrete perspectives: (a) the impact of music listening and (b) the impact of music instruction. Schellenberg (2001, 2003) argues that each activity (listening vs. taking instruction) has a unique impact on perceptual and cognitive function. I would add that as such, the implications for research, practitioners, and policy makers would also be distinctly different.

Music Listening

Infants

The first indications of a response to musical stimuli occur in the last three months of pregnancy. During this period, the auditory cortex and neurons of a fetus have stabilized and are functioning (Lecanuet, 1996; Moore, Vareyar, Fulford, Tyler, Gribben, Baker, James, & Growland, 2001). Researchers have found clear evidence of fetal responses to musical stimuli (Abrams, Griffith, & Huang, 1998; Blum, 1998; Staley, Iragui, & Spitz, 1990). Furthermore, it is thought that musical sounds introduced in utero, after the auditory cortex has developed, can affect subsequent infant behavior (Olds, 1985). O'Connell (2003) found that infants who were exposed to a music timbre prenatally were able to discriminate, as measured by heart rate, between their prenatal timbre and other similar timbres through one week of age postnatally. In an experiment examining infants born prematurely, Lynch, Short, and Chua (1995) found that infants responded with differential changes in vital functions including heart rate, blood pressure, and respiration when listening to recordings of contrasting musical styles.

The results of studies with infants at varying points within the first twelve months provide much supportive evidence for the existence of sophisticated musical functioning. Trainor, Tsang, and Cheung (2002) found that two- and four-month-old infants preferred consonant rather than dissonant intervals. Further, the researchers found it difficult to recapture subjects' interest after a series of dissonant interval trials. They concluded that consonance perception could provide a means of learning the pitch structure of the musical system to which an infant may be exposed.

Hannon and Johnson (2005) employed a habituation strategy to examine whether sevenmonth-old infants could categorize rhythmic and melodic patterns on the basis of the underlying meter. Infants presented with metrical melodies detected reversals of pitch and meter while infants presented with non-metrical melodies expressed no preference. The researchers concluded that infants can infer meter from rhythmic patterns and that they can use this metrical structure to secure their knowledge acquisition in music learning.

Ilari (2004) investigated infants' preferences and long-term memory for two contrasting complex pieces of music. Eight-and-a-half-month-olds were found to distinguish the two pieces in orchestra timbre and could discriminate between the piano and the orchestra timbres. Ilari concluded that contrary to the belief that infants are ill equipped to process complex music, infants could encode and remember complex pieces of music for at least two weeks.

Saffran, Loman, and Robertson (2000) found that infant subjects retained familiarized music in long-term memory. The infant's listening preferences were affected by the extent to which familiar passages were removed from the musical contexts within which they were originally learned.

Schmidt, Trainor, & Santesso, (2003) examined EEG and heart rate responses to affective musical stimuli development of infants' at the third, sixth, ninth, and twelfth month. The distribution of EEG power was found to change across age. Younger subjects demonstrated no difference in activity between two specific regions of the brain while older subjects exhibited relatively more activation in one region than the other. This likely reflects the normal maturation of frontal lobe function. Further, when compared with a baseline, the presentation of emotionally-expressive music significantly increased brain activity at the third month, had little effect at the sixth and ninth month, and significantly lessened brain activity at the twelfth month.

The researchers concluded that there was a distinct developmental effect of music on brain activity in the first year, with music having a "calming" influence on infants by the end of the first year of life.

The array of musical responses demonstrated by infants in the first year of life is considered to be more a reflection of innate capabilities made available through normal brain development than through learning (Imberty, 2000; Trehub, 2000). Further research is needed to determine whether or not there exists a point after the first year at which music learning begins to support and possibly enhance natural brain development to result in enhanced musical capabilities. Similarly, it is important to examine whether there exists critical periods during which particular types of exposure must occur for future musical development to take place.

Music and Memory

Music, originally associated with specific information, has been found to significantly improve the recall of that information (Balch, Bowman, & Mohler, 1992; Boltz, Schulkind, & Kantra, 1991; Wallace, 1994). However, this effect can be explained easily by stimulus generalization, a fundamental tenet of psychological theory that concerns the transfer of a response learned to one stimulus to a similar stimulus. Research is needed that includes comparisons with other (non-music) stimuli to determine whether a music-dependent effect can be retained.

The "Mozart Effect" \mathbb{R}^1

Since 1993, when Raucher, Shaw, and Ky (1993) published their initial findings linking an improvement in IQ after listening to 10 minutes of classical music, the music education profession has had to wrestle with a phenomenon labeled the "Mozart Effect."® The notoriety created by associating a simple passive music-listening task to such a highly coveted result as

improved intelligence is something with which the music education community has not been entirely comfortable. This is true for several reasons. First, valuing music education for its collateral benefits is considered to be a questionable philosophical foundation (Duke, 2000; Reimer, 1999). Second, the effect has been difficult to replicate consistently. In the body of research that employed spatial-temporal reasoning as a dependent variable [the specific IQ subtest found by Rauscher, et al. (1993) to be linked to music listening], some researchers found significant positive results supporting the effect (Rideout, Dougherty, & Wernert, 1998; Rideout & Laubach, 1996; Rideout & Taylor, 1997) while others did not (Carstens, Huskins, & Houshell, 1995; Chabris, 1999; Steele, Bass & Crook, 1999; Steele, Brown, & Stoecker, 1999; Steele, Della Bella, Peretz, Dunlop, Dawe, Humphrey, Shannon, Kirby, & Olmstead, 1999). Further, when examining alternative measures of IQ such as working memory (Steele, Ball & Runk, 1997) or abstract reasoning (Newman, Rosenbach, Burns, & Laitmer, 1995; Stough, Kerkin, Bates, & Mangan, 1994), no support was found for the effect.

Some resolution to the questions surrounding the "Mozart Effect" (may be found in a series of studies that were systematically conducted to uncover understanding about the underlying mechanisms driving the effect. The effect was found not to be limited to the music of Mozart (Jackson & Tlauka, 2004) nor even to music in general (Nantais & Schellenberg, 1999). Rather, spatial ability was consistently found to be a consequence of subjects' emotional states, specifically higher arousal levels and positive moods being associated with improved spatial ability (Husain, Thompson, & Schellenberg, 2002; Thompson, Schellenberg, & Husain, 2001). Further, this arousal and mood effect could be generalized to non-spatial ability measures of IQ as well as to measures of creative ability (Schellenberg, Nakata, Hunter, & Tamoto, in press). In short, music has been found to affect IQ, creative ability, and other cognitive functions, but only to the extent that it does so by affecting arousal and mood. In essence, consistent supportive evidence has been found for an "arousal and mood effect" rather than for a "Mozart Effect"® *per se*.

Musical Training

Evidence from Neuroscience Brain Research

There are a growing number of studies that have used electroencephalogram (EEG), functional magnetic resonance imaging (fMRI), and to a lesser extent, positron emission tomography (PET) to track brain activity in children in an effort to uncover connections between such activity and music learning experiences. Music is a widely-distributed system in the brain with various musical tasks processed differentially in the hemispheres. In general the left hemisphere tends to be more sensitive to pitch processing (e.g., melody) and the right to temporal processing (e.g., rhythm); there are some indications that these hemispheric specializations may develop with age (Overy, Norton, Cronin, Gaab, Alsop, Winner, & Schlaug, 2004). Further, exposure to different styles of music produces varying types of brain activity in children (Flohr & Miller, 1995). Altenmüller, Gruhn, Parlitz, and Kahrs (1996) found that a fiveweek period of musical training, compared to other types of instruction, produced unique cortical brain activation patterns. Flohr, Persellin, and Miller (1996) found EEG activity differences in children receiving music instruction compared with those receiving non-music instruction. Similarly, when comparing three distinct types of notation used to represent music (musical, verbal, and numerical), Schon, Anton, Roth, & Besson (2002) found that reading musical notation produced activity in unique regions of the brain, indicating that the visuo-motor transcoding pathways used for reading musical notation may differ from those used with reading verbal or numerical notation.

Evidence from Operational Indicators of Intelligence

A larger number of studies have used various operational indicators of intelligence to examine the connection between music learning and cognitive development. Music instruction is positively associated with a number of cognitive functions including spatial-temporal abilities (Hetland, 2000), visual-motor integration (Orsmond & Miller, 1999), selective attention (Hurwitz, Wolff, Bortnick, & Kokas, 1975), memory for verbal stimuli (Chan, Ho, & Cheung, 1998; Ho, Cheung, & Chan, 2003; Jakobson, Cuddy, & Kilgour, 2003; Kilgour, Jakobson, & Cuddy, 2000), reading ability (Butzlaff, 2000), and mathematical skills (Vaughn, 2000).

In the effort to venture beyond correlational research and explore a causal connection between music instruction and various relevant independent variables, several researchers have employed a random subject assignment to various music and non-music instruction treatments to insure that extraneous variables (socio-economic background, involvement in other extra curricular activities, etc.) would not affect the results. When using a randomized sample with an experimental design, Lu (1986) found no significant effect of music instruction on the reading ability of first-grade students. In contrast, several researchers have found a causal influence of music instruction on spatial ability using random subject-assignment procedures (Gromko & Poorman, 1998; Rauscher, 2002; Rauscher & Zupan, 2000). However, their results could not support the notion that the influence of music instruction is unique among other types of instruction or that the influence would be not found with other, more general indicators of intelligence because these issues were not examined.

In a more recent study, Schellenberg (2004) sought to examine the unique effect of music instruction on a global indicator of intelligence by comparing the effects of music instruction, drama instruction, and no instruction on intelligence as measured by the entire Wechsler

Intelligence Scale for Children Third Edition (Weschler, 1991). The Weschler test is comprised of four indices, verbal comprehension, perceptual organization, processing speed, and freedom from distractibility that are combined to provide an overall IQ score. Compared to the drama group and the no instruction control group, the music subjects produced greater increases on all four indices. These findings support the notion that music instruction when compared to drama instruction or no instruction has a unique positive influence on intellectual growth as measured by a global indicator that included dimensions other than spatial ability. Further research is needed to examine the effects of music instruction on additional global indicators of intelligence. There is also a need to continue comparing music instruction with other types of instruction to determine the degree to which music is unique in this regard.

Assimilating Evidence from Brain Research and Operational Indicators of Intelligence

When reviewing brain research using EEG and other neuroscientific tools, it is clear that musical experiences and music instruction produce specific and predictable patterns of activity in the brain. What is not so clear is the exact meaning of those predictable patterns of brain activity regarding cognitive function. Conversely, there is substantial correlation evidence linking music instruction to improved performance on a number of operational indicators of cognitive function. Further, researchers are beginning to establish *causal* connections between music instruction and improved performance on some of those operational indicators. The challenge to this line of research is that operational indicators, no matter how reliable, constitute indirect measures of a phenomenon. Perhaps the next logical step in exploring the effect of music instruction on cognitive function might be to combine the use of neuroscientific tools and operational indicators to determine whether predictable and directly observable patterns of brain activity can be associated with specific cognitive abilities. In fact, such a study is now underway (Schlaug,

Norton, Overy, Cronin, Lee, & Winner, 2004). Beginning instrumentalists are undergoing brain scans during the first three years of study along with taking a battery of cognitive assessments. Ideally, this study will provide critical information concerning the effects of music instruction on brain and cognitive development. More research is needed that combines the use of neuroscientific tools and operational indicators to explore the effects of music learning effects of music learning effects of music learning on cognitive and perceptual development with a variety of population demographics (age, area of study, experience, etc.).

MOTOR DEVELOPMENT

Many researchers have examined how motor skill development affects music learning (Campbell, 1991; Sidnell, 1986; Synder, 1988 Turner, 1998;) and performance, especially that of conductors (Kun, 2004; Neiman, 1989; Neidlinger, 2003) and pianists (Ragert, Schmidt, Altenmüller, & Dinse, 2004; Waters, 1992). Phillips-Silver and Trainor (2005) found that even healthy seven-month-old infants learned to distinguish between duple and triple meter with the aid of accompanying bouncing movements significantly more accurately than with a passive listening treatment.

Far fewer have examined how musical stimuli and musical learning impact motor development. Although the two approaches seem to be inextricably intertwined, it is the expressed purpose of this section to feature the latter. The small amount of existing research concerning the impact of music education on motor development uses subjects grouped in the following categories: (a) early childhood and preschool, and (b) school-aged children.

Early Childhood and Preschool

Gruhn, (2002) conducted a longitudinal study that was designed to examine the phases and stages in children's early music learning. A group of 12 children (six male; six female) aged one

to two years was recruited from an urban, upper middle class area in Freiburg, Germany and observed with respect to their musical behavior in a stimulating musical setting for 15 months. This group was compared with a control group aged one-two years (N = 9; three male, six female) from a local nursery school. All children were videotaped and then evaluated by two independent judges using a criterion-based observation form with ratings for the categories attention, movement and vocalization (imitation, improvisation, audiation). Although children in both groups displayed a similar developmental level at the start of the study, differences between the two groups became evident throughout the observation period. The control group, which was exposed to no particular music except the songs of the daycare program, developed body movement and vocal performance at a significantly lower level than their counterparts. The most significant effect within the experimental group was a strong interaction between flow of movement and motor coordination, and vocalization of tonal and rhythm patterns.

Gilbert (1980) designed the Motoric Music Skills Test (MMST) to examine how young children utilized motor tasks with music. The MMST consisted of five subtests: (a) motor pattern coordination, (b) eye-hand coordination, (c) speed of movement (d) range of movement, and (e) compound factors. Gilbert administered the MMST to 808 children, ages three through six. Girls significantly out-performed boys on the subtests of motor pattern coordination, eye-hand coordination, and compound factors. This result is consistent with findings of Flohr (1991) on tests of maintaining steady beat and those of Schleuter and Schleuter (1985, 1989) on three specific motor skills (clapping, stepping, and chanting). Gilbert (1981) conducted a follow-up study utilizing a stratified random sample from the population of 808 original study subjects to determine whether or not the original findings could be confirmed and to examine whether motoric music skills stabilized with age. The gain scores of four-year-olds were significantly

greater than those of seven-year olds in every subtest of the MMST. Gilbert asserts that these results substantiate the idea, common among motor theorists, that most fundamental motor patterns emerge before age five and stabilize beyond that point. However, in both of Gilbert's investigations, it was unclear whether the improvement was due in any part to music instruction.

Brown, Sherrill, & Gench, (1981) examined two approaches to facilitating perceptual-motor development in four-six year old kindergartners (N = 30). The experimental group received 24 sessions of integrated physical education/music instruction, while the control group received 24 sessions of movement exploration and self-testing instruction. An analysis of covariance indicated that significant improvement occurred only in the experimental group with changes in the motor, auditory, and language aspects of perceptual-motor performance as well as in the total score.

Kalmar, (1982) examined the effects of a method of singing instruction involving the accompaniment of music with rhythmic movements and the verbal or physical representation of songs on the development of young children. Twenty three-year-olds were pretested and assigned to either the experimental group, that received twice-weekly special singing lessons based on the Kodaly method over three years, or the control group, that attended only regular nursery school programs. The experimental group showed greater improvement than the control group on measures of motor development, particularly dynamic coordination, abstract conceptual thinking, and play improvisation and originality. On an adaptation of the Torrance Tests of Creative Thinking, the experimental group demonstrated superior performance on subtests requiring verbal responses, but not on those involving drawing. Further, no between-group differences in IQ were found.

Pollatou, Karadimou, & Gerodimos, (2005) examined gender differences in preschool students regarding musical aptitude, rhythmic ability, and motor performance. Subjects (N = 95), including five-year-old girls (n = 50) and boys (n = 45), were administered the (Gordon) Primary Measures of Music Audiation, the High/Scope Rhythmic Competence Analysis Test, and the Gross Motor Development Test. Although no significant gender differences were found in musical aptitude and gross motor skills performance, girls outperformed boys in four of the six movements of rhythmic ability test.

Zachopoulou, Tsapakidoub, & Derric, (2004) compared the effect of a music and movement program to a physical education program on the development of jumping and dynamic balance in children ages four through six. Subjects (N = 90) were placed into either an experimental group (n = 50) that followed the music and movement program or a control group (n = 40) that followed the physical education program. All subjects received instruction two days a week for 35-40 minutes each day over a two-month period. Pretest and posttest data were analyzed using a multivariate analysis of variance with repeated measures. The control group showed no improvement. The experimental group improved significantly in both the jumping and dynamic balance tasks. According to the authors, rhythmic ability is the ability to observe, control, and differentiate the rhythm of a movement according to the environmental demands at a given time, enabling the quick motor adjustments of the performer in an unpredictable environment and assuring success in performance. The authors conclude that music and movement education facilitates development of rhythmic ability in motor skills execution.

School-Aged Children

DeVries (2004) sought to investigate the extra-musical effects of a music education program in one preschool classroom over a period of six weeks. The class had not previously been exposed to regular music lessons. Among increases in other variables including socialization, expression, sociodramatic play, and listening skills, engagement in music-movement activities were found to develop motor skills in children.

Baer (1987) sought to examine the strength and nature of the relationships (a) between music aptitude and motor development and (b) between instrumental music achievement and motor development utilizing, as subjects, 136 middle school students in grades seven through nine who were members of their school band or orchestra. A low-moderate positive correlation was found between music aptitude and motor development (r = .33) and between instrumental music achievement and motor development (r = .26). Further, higher correlations between motor development and musical performance achievement were found for string instrument players as compared to wind and percussion instrument players, and for girls as compared to boys. Music aptitude was related to music gross motor skills more so than to fine motor skills; however, musical performance achievement was related to fine motor skills more so than to gross motor skills. Results need to be interpreted with caution due to the intact nature of the subject sample.

Although a small number of references were found for studies examining the effect of music and music education on motor development, a few clear patterns appear to emerge. For preschoolers, girls tend to outperform boys in music-related psychomotor tasks such as maintaining a steady beat, specific music motor skills, and movement tests of rhythmic ability. They also do better on general motor tasks with music such as measures of motor pattern coordination and eye-hand coordination. More research is needed to determine whether those differences persist or fade as students age and/or mature in other ways. Such developmental information would be helpful to practitioners when planning for the use of instructional materials. Another emerging pattern is that a stimulating musical environment has a positive effect on motor coordination and perceptual motor development, as well as on general motor skills. For school aged children, less is apparent due simply to the paucity of research on this level. Currently, most of the conclusive evidence is with samples drawn from younger populations, foreshadowing the possibility that music involvement at an early age may have a fundamental impact on a variety of different resultant skills. More research is needed at all levels of development to determine the extent to which musical experiences affect motor development.

EMOTIONAL DEVELOPMENT

Nelson (1983) addressed basic issues concerning the dual nature of music learning by defining the relationships between cognitive and affective growth in children and by discussing aspects of music learning in relation to its aesthetic nature. A theoretical model of affective development proposed by Giblin (1981) was compared to the Piagetian theories of intellectual development. Nelson concluded that such a comparison "falls short" in accurately describing the personal nature of aesthetic responsiveness to music. He stated the need for specific definitions of affective learning as it might relate to music concept development.

Emotional Response to Music Listening

Since the early 1990's, attention has been afforded the Continuous Response Digital Interface (CRDI) as a tool for synchronously measuring subjects' emotional responses to musical stimuli (Madsen, Brittin, & Caperella-Sheldon, 1993; Madsen, Caperella-Sheldon, & Johnson, 1991; Madsen & Fredrickson, 1993). With advent of the CRDI, researchers investigating emotional response to music have examined a variety of variables, including among others, visual/aural conditions (Adams, 1995; Frego, 1999), preference for music of other cultures (Brittin, 1996), the effect of performer use of rubato on listener perception of tension (Fredrickson, 1996) and tempo modulation (Sheldon & Gregory, 1997).

Of particular interest to the present review are those studies in which subjects of varying levels of music experience or education have been compared. Brittin (1996) compared college music majors' (n = 75), non-music majors' (n = 75), and junior high school musicians' (n = 75) preferences for music of other cultures. Further, subjects from each group were randomly assigned one of three response modes: (a) Likert-type scales, (b) one CRDI device indicating preference only, and (c) two CRDI devices, one indicating preference and the other indicating complexity of the excerpts. No differences were found between subjects using one CRDI and those using two CRDIs. Subjects using one or two CRDIs rated sections significantly higher than did subjects using paper-and-pencil rating scales. No significant differences in preference for music from various cultures were found among any of the three levels of music experience.

Frego (1999) compared college-level musicians (n = 81) and non-musicians (n = 81) when examining the effects of aural, visual, and combined aural/visual conditions on the emotional response to music and dance. Subjects were randomly assigned to the three conditions and asked to respond to three dance and music performances by indicating the degree of perceived artistic tension using a CRDI device. No significant differences were found among the three conditions. Further, no significant differences were found in perceived artistic tension between musicians and non-musicians.

Fredrickson (1999) examined whether musicians who rehearse and perform a musical selection perceive tension in the music differently than do listeners who have not had the performance experience. Visual inspection of CRDI graph results was used to confirm that

experience of performing the music did not seem to greatly affect perception of tension as measured in this study.

Forty college music majors and thirty non-majors were asked to use a CRDI device to record their perceptions of tension in two selections of jazz music (Fredrickson & Coggiola, 2003). Each selection was a uniquely stylized version of "St. Louis Blues" by W. C. Handy. Music majors' responses did not seem to differ markedly in overall contour from non-music majors' responses, which is consistent with previous research. The authors noted that subjects had no trouble performing the task or using an existing internal definition of musical tension.

Common to all of the studies above is that level of experience or education does not seem to be a factor when asking subjects to provide an emotional response to a variety of musical stimuli. Those with less music experience seem to have similar emotional responses to musical stimuli as do those with more music experience. Further, when presented two or more distinct musical stimuli, subjects, regardless of experience level, offered distinctly unique responses to each stimulus. Perhaps, as Fredrickson and Coggiola (2003) assert, people tend to employ an existing internal definition of musical tension and that definition does not seems to be affected by a general level of music experience or education.

Emotional Response as a Result of Musical Learning

Parisi (2004) assessed fourth- and fifth-grade students' (N = 102) affective response and ability to discriminate between melody and improvisation after receiving instruction in singing and/or playing a piece in the blues style. To facilitate responses being differentiated across time rather than in aggregate by use of arithmetic means, an *a priori* decision was made to analyze the data graphically and descriptively. Subjects receiving specific instruction in melodic and improvisatory discrimination responded with a higher level of discriminatory skill and positive affective response than those receiving non-specific instruction.

Coggiola (2004) compared the aesthetic responses of jazz musicians (n = 64) and non-jazz musicians (n = 64) when listening to jazz music selections that vary in level of conceptual advancement (melodic complexity during improvised solos). Data were gathered as participants manipulated a CRDI dial to indicate the magnitude of their aesthetic responses as they listened to four audio selections. Of the four examples, a significant difference between the two participant groups was found only for the most conceptually advanced selection. Jazz musicians rated this selection significantly higher than did non-jazz musicians. Coggiola concluded that greater instrumental jazz ensemble experience is related to greater aesthetic interest when listening to a jazz selection containing a high level of conceptual complexity.

Misenhelter and Price (2001) asked undergraduate non-music majors (n = 32) and undergraduate and graduate music majors (n = 42) to listen and manipulate a CRDI dial to indicate their affective responses to excerpts from a sophisticated piece of music (Igor Stravinsky's *Le Sacre du printemps*). Significant differences were found in the responses between music and non-music majors. Visual analyses revealed that the variability between the groups most often corresponded with changes in musical texture. The authors concluded that non-musicians in particular may have insufficient musical background or exposure to "absorb the nontraditional (non-tertiary) harmonic and textural palettes of a work such as *Le Sacre du printemps*, resulting in a lower overall affective response" (p. 327).

Emotional Response from Musical Performance Participation

Ruggeri (2003) sought to describe the experience of adult amateur musicians as they pursued their passion of playing chamber music. Ruggeri also explored the importance and meaning of this activity in their lives. Musicians in the study reported the ability to express their identity in a non-verbal conversation, producing a pleasurable sound and engaging their faculties in a state of deep concentration often approaching transcendence, resulting in an aesthetic response. The musicians' conscious experience of enjoyment was accompanied by a less conscious learning process involving perceptual, emotional, intuitive and kinesthetic development and pattern comprehension as well as a sense of deep fulfillment derived from sustained attention. These alternative modes of understanding seem to support the assumption that learners create their own knowledge and meaning. Ruggeri concluded by arguing that aesthetic experience is central to adult education and learning. I would add that such an experience can and should be central to children's education and learning as well.

Summary of Impact on Emotional Development

Sloboda (1985) suggests that "untrained musicians have implicit knowledge of that which musicians can talk about explicitly" (p. 5). Perhaps such "implicit knowledge," similar to Fredrickson and Coggiola's (2003) "existing internal definition of musical tension," is self-evident when responding to common musical stimuli. The results found by Coggiola (2004) and by Misenhelter and Price (2001), however, support the idea that responding to musical stimuli that exceed a particular level of musical or compositional sophistication might not be implicit to the less experienced or less knowledgeable listener. Similarly, musical instruction in much younger students seems to influence how they might respond emotionally to musical stimuli (Parisi, 2004). Perhaps what may be concluded from this portion of the review is that although most people respond emotionally to music, music instruction seems to have a positive effect on the level of sophistication with which one is able to experience that emotional response.

From a broader perspective, however, there is a need to study the impact of music education on emotional response and development using a wider range of tools than only the CRDI dial. Although the CRDI provides rich and vast amounts of quantitative information, it is but one way to examine a topic that is highly complex and inherently multifaceted. Research, using additional tools, is needed to verify the "sophistication effect" mentioned above. Nelson (1983) noted the need for specific definitions of affective learning as it might relate to music concept development. That work is yet to be attempted. Further, emotional development toward achieving what Maslow (1964) describes as the self-actualizing individual or what Rogers (1961) describes as the fully-functioning adult is often at the heart of what many philosophically offer as a primary benefit of music and music education. Policy makers tend to reward or support initiatives that demonstrate some sort of measurable pragmatic benefit. What is needed is convincing philosophical inquiry as well as other types of research into the benefits of emotional development and an exploration into the unique contributions that music and music education may provide.

SOCIAL DEVELOPMENT

Many researchers exploring the connection between music learning and the social development of children have utilized special populations as subjects; however, very few social development investigations have been conducted using normal populations. Forrai (1997) conducted a three-year longitudinal study comparing children, aged six months to three years, exposed to a greater number of musical influences with children of the same age exposed to little singing or music. The group with more musical influences exceeded the other group over several dependent variables, including initiations of social contact. Hood (1973) examined the effect of daily music instruction on nonmusical personal and school activities and found that students

receiving daily music instruction had a significantly lower rate of absenteeism than did students in the control group.

Suthers (2001) conducted a case study of a one-year-old child's responses to a program of music experiences. The program was implemented in the toddler playroom of a daycare center for ten months. The music experiences provided in the program included free music play, sociable music experiences, and music incorporated into care-giving routines. The subject's responses were recorded and changes in the physical, language and social development were documented. Based on the findings the researcher concluded that much of the learning occurred through imitation and social interaction and that participation in self-selected music experiences may encourage toddlers to develop a disposition to engage in music making.

McCusker (2001) qualitatively examined the graphic invented notations created by eleven children, ages five to seven, in an effort to gain an understanding of the cognitive processes underlying emerging musical literacy. The researcher found that the difference between children responding only to teacher-initiated activities and those using familiar music materials for creative self-statements was a stronger influence than age. An unexpected theme that emerged from the data was subjects' development as a community of learners and the influence this social context had on children's music making. Miller (1983) found a similar phenomenon when examining behaviors that young children demonstrate naturally and describing how these behaviors manifested in social interactions with peers. Three-, four-, and five-year-olds served as subjects (N = 95). Subjects were found to be capable of creating music without teacher intervention. Further, three-year-olds tended to be involved in symbolic solitary play, while the older children exhibited more social interactions such as imitating each other.

Summary of Impact on Social Development

From the scant literature that exists concerning the effect of music on normal populations' social development, there appears to be several positive effects. Those include an increased initiation of social contact, lowered rates of absenteeism, and an emerging propensity for selfdirected and group-directed learning, rather than teacher-directed learning. Though this information provides some new knowledge, it is disparate and, as such, difficult to draw useful conclusions. To generate more conclusive information, systematic lines of research over a number of studies are needed to examine particular aspects of music's effect on social development. For example, the existing literature provides a start to examining connections between musical involvement and self- and/or group-directed learning. Investigations could be conducted into how and why such connections occur as well as effects on the development of subsequent skills such as leadership, dynamic cooperative learning, and independent and creative thinking. Additionally, there is a need to examine how music-learning experiences impact diversity awareness. In an increasingly pluralistic society, it is important for students to develop a greater awareness of others around them. Research is needed to examine how music learning may facilitate such awareness for students as well as long-term impacts on society in general.

IMPACT ON AT-RISK STUDENTS

Much has been written about the positive effects of participation in extra curricular activities, the arts in particular, and music specifically on at-risk students, precious little of it being research. Authors of books, book chapters, and journal articles tend to describe programs, projects, and particular situations in which participation in the arts have positively affected specific students and groups of students. Although a good many of these descriptions are rich with detail and may provide a vast number of potential researchable ideas, none can be said to have undergone the rigor associated with systematic inquiry. In the following section I will review the small amount of research that exits in this area and highlight trends, draw conclusions, and make suggestion based on this review.

The Role of Extra-Curricular Activities

There is consistent empirical support for a positive correlation between being involved in extra-curricular activities and staying in school. Bowman and Matthews (1960) conducted a longitudinal study and found that dropouts were involved in fewer extra curricular activities than those who remained in school through graduation. Similarly, Brooks (1989) found that Hispanic females who remained in school participated in extracurricular activities more often than dropouts. Two studies commissioned by state organizations found similar results. The New York State Education Department Bureau of Guidance commissioned a study in which questionnaires were mailed to 2,448 graduates and 1,286 dropouts. Graduates were found to participate more in all activities and services than dropouts and they placed more value on the activities than did the dropouts (Developing Work-Study Programs, 1971). More dramatically, in a study commissioned by the West Virginia Department of Education, 93% of dropouts were found to never participate in extra curricular activities (West Virginia School Dropout Prevention Task Force, 1991).

The Role of Early Intervention

Another trend is that early intervention has a strong positive effect. Gudeman (1987) studied the Union School District of New Jersey as a model in the area of dropout control with a population of over 6,000 students and a dropout rate of 1 percent. He concluded that dropping out of school can be prevented with reduced effort and expense when strategies are implemented during the preschool years and the first several grades of elementary school. Simner and Barnes (1991, Winter) found that 70% to 80% of those children who are at risk for early school failure can be identified one to two years *before* they enter first grade. Similarly, Wilcynski, (1987) sought to determine the extent to which selected characteristics that exist among elementary age children are accurate predictors of students who will leave school prior to high school graduation. There were significant differences between dropouts and graduates in 18 of 20 selected characteristics. A regression analysis was used to determine that an academics/intellect cluster had the greatest relationship with dropouts and graduates. Adding either student behaviors or demographics to the academics/intellect cluster increased almost equally the explanatory power of the analysis.

The Role of Participation in the Arts

Several researchers have found that participation in the arts has positive effects on at-risk students. Acer (1987) concluded that integrating the study of language, music, drama, and dance for at-risk students could address many recommendations for juvenile delinquency prevention. Teachers from 43 urban and ten suburban elementary schools, subjects in the study, noted increases in self-esteem, academic success, self-discipline, and in school commitments among their at-risk students. After comparing self-concept scores of before and after participation in a project providing experiences in dance, drama, music, and visual arts, Barry (1992) found significant improvements in self-esteem for underprivileged children. When comparing interests between achieving and underachieving students, Ciborowski (1986) found that achieving students expressed more interest in life activities that involved music and drama, among other variables, than did underachieving students. In a study published by the Center for Music Research (1990), at-risk students were found to remain in school solely because of their commitment to music programs such as band, choir, and orchestra, as well as other arts including

dance, drama, painting, and sculpture. Bond, Smith, Ross, Nunnery and Goldstein (1992) investigated the effectiveness of a reading program that incorporated singing. The program was found to be more effective for younger children (K-first grade) and for children of low economic status (many of them being at risk). Coronado (1999) investigated the effects of a summer performing arts program, Summer At The Center, on at-risk students' school attendance, GPA, and arts participation among other variables. No significant increase in school attendance rates was found; however, the grade point averages of the students increased significantly between before and after participating in the program. Further, arts participation was also found to have significantly increased after Summer At The Center finished. Taetle (1999) investigated the relationships among daily school attendance, grade point average (GPA), and enrollment in fine arts electives. Students with lower absentee rates tended to have higher GPAs, Further, students not enrolled in fine arts electives had significantly higher absentee rates than those students with at least one fine arts elective. Finally, students with low GPAs who were not enrolled in fine arts electives had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective.

The Role of Music Learning

There are very few investigations in which the specific role of music learning is examined for its effect on at-risk students. Jenlink (1993) conducted a qualitative study of a school's attempts to raise the self-esteem of its at-risk students by emphasizing the school's music program. The author concluded that the music program lessened students' feelings of alienation, promoted individual growth, and provided a common bond between the home and the school. Further, participation in the select musical performing group promoted goal attainment, teamwork, leadership, academic achievement, feelings of success, and cultural exposure. Nelson (1997) investigated participation in choral music as an affective intervention for highrisk adolescent males. The choral program was found to be an affective intervention for high-risk adolescent males. Shifts in self-perceptions and in how the choir members grew to value their choral experience emerged in three categories: status, co-musical benefits, and inner rewards. Affective assertions included: (a) performing in choir was special to them, (b) the relationships they developed in choir were different than those they had with other residents, and (c) there were moments in choir that were wonderful, difficult to verbalize, and for many, deeply personal.

Leidig (1983) sought to describe a successful inner-city high-school instrumental music program and attempt to account for such success. The three primary factors appearing to affect the success of the program were (a) teacher commitment, (b) suitability of curriculum, and (c) effective classroom and programmatic management.

Ebie (1998) conducted a qualitative investigation of two music educators' perspectives on students who were successful in music but not in other classes. Five conclusions were drawn from the results:

- 1. Music is an important factor in the lives of at-risk and other children.
- Participation in the music ensemble appears to provide students with feelings of personal accomplishment.
- 3. Participation in a music ensemble can provide students with leadership roles and give them feelings of responsibility.
- 4. Music itself seems to be a salient factor in improving the lives of at-risk students.
- 5. The extent to which the music teacher becomes involved in the life of the music students seems to be a factor in their success. (p. 63)

Shields (2001) investigated the role and importance of music education as an intervention for at-risk urban adolescents through participation in performance groups and being mentored. Significant improvements were found in students' self-perception of musical competence. Further, students' ranking of music as being important in their lives improved from 76% to 82 %. Interviews provided evidence of the importance of music, music education, and the music teachers in the students' lives.

Summary of Impact on At-Risk Students

From the research, it is known that involvement in extra-curricular activities is consistently positively correlated with staying in school. Further, precursors to dropping out can be detected and effective interventions implemented during the preschool and early elementary school years. Participation in the arts, as a specific extra curricular area, is consistently found to (a) affect selfesteem, (b) be correlated with lower absenteeism, and (c) be associated with staying in school. Of the studies in which the effects of music instruction on at-risk students are examined, the results are positive but difficult to use as a basis from which to draw conclusions. This is due to the few number of investigations and the disparate variety of approaches across the investigations. Similar to the suggestions for further research into the impact of music learning on social development, systematic lines of research over a number of studies are needed to examine specific aspects of music's effect on at-risk students. Such lines of research need to be of sufficient length and similarity so as to provide the depth of inquiry needed to draw appropriate and valid conclusions. One example of such a line might be to examine whether music learning is an effective early intervention. In what ways might music serve as an early intervention that other disciplines might not? Another line might be to examine each of the affective assertions proposed by Nelson (1997) to determine the degree to which involvement in music learning might be unique.

IMPACT ON SPECIAL NEEDS STUDENTS

Researchers exploring the connection between music and special needs students have examined the topic in a variety of different ways. In a substantial number of studies, researchers have examined attitudes toward and acceptance of those with special needs using music students as the population from which samples were drawn (Jellison, Brooks, & Huck, 1984: Johnson & Darrow, 1997, 2003). Others have examined the effect of inclusion on the music learning of those with and without disabilities (Jellison, 2002; Force, 1983). Still others have tested the effectiveness of various musical instructional methods especially modified for students with special needs (Colwell, 1995; McCord, 2002). Each of these perspectives is worthy of study because music class is typically where students with disabilities are initially mainstreamed. Knowing more about attitudes toward special needs students, how their inclusion affects learning, and how instructional strategies might be best designed is beneficial to music teachers who tend to encounter special needs students more regularly than their non-arts peers. Nevertheless, none of these common research tacks actually examine the impact of music and music education on special needs students, which is the purpose of this section.

Music Therapy and Special Needs Students

Similar to the studies associated with social development and at-risk students, there are few investigations into the effect of music and music learning on special needs students. Most of those researchers who have examined how special needs students are impacted by music learning experiences have specifically investigated the effects of music therapy (as the music learning variable) on special populations. Aldridge, Gustorff, & Neugebauer, (1995) examined the effects

of music therapy on developmental changes of developmentally delayed (DD) children. Five DD children, ages four to six and a half, receiving three months of music therapy were compared with three DD children serving as waiting-list controls. The researchers noted that (a) focused listening in a structured musical improvisational context without language demands provided a platform for improved communication, (b) musical dialogue seemed to bring about improvement in the ability to form and maintain personal social relationships in other contexts, and (c) eye and hand coordination was a vital component in developmental change, especially drumming activities.

Conversely, Duffy and Fuller (2000) compared subjects in music (n = 16) and in non-music interventions (n = 16) and found that significant improvement in five target skills (turn-taking, imitation, vocalization, initiation and eye contact) to be independent of either eight-week interventions.

Frick (2000) conducted a case study designed to describe the classroom music activities and communication patterns of four young children with disabilities in an early childhood special education classroom, and to explore how types of music, methods of music inclusion, and children's individual differences may contribute to the process of communication development. The researcher noted that music, presented in a routine manner and supportive of instruction, resulted in more vocalization. Additionally, Frick noted that music created a social context for child-to-child interaction.

Robb (2003) studied the behaviors of six visually impaired children between the ages of four and six years. Subjects participated in four, 30-minute instructional sessions. Two instructional sessions were music-based and two were play-based with the four sessions equally distributed
across a two-week period. Each session was videotaped to facilitate collection of behavioral data. Attentive behavior was found to be significantly higher during music based-sessions.

Humpal (1991) examined the effects of an integrated early childhood music program on social interaction among children with handicaps and their typical peers. Interaction among the children increased following the music therapy intervention phase. It was also concluded that the program had facilitated peer interaction and had fostered acceptance of differences among individuals.

Summary of Impact on Special Needs Students

Although there is fairly consistent support for use of music as an effective therapy for special needs students, the profession needs more research. Music therapists are in the unique position of having to substantiate the worth of their practice to non-musicians (e.g., those in the medical field). Similar to previous recommendations, the research in this area needs to be conducted in lines of sufficient length to provide practical information for the therapist as well as clear, objective, patterns of results to the medical and educational fields.

AREAS IN NEED OF FUTURE RESEARCH

Perception and Cognition

The first indications of responses to musical stimuli occur in the last three months of pregnancy. Once an infant is born, however, there is a flurry of brain activity and associated musical functioning. At first, most of this functioning is considered to be the manifestation of innate capabilities and normal brain development. Research is needed to determine whether there exists a point after the first year of life at which music learning begins to support and enhance brain development. Similarly, it is important to examine whether there are critical periods during which particular types of exposure must occur for future development to take place.

Due to the notoriety of Rauscher, Shaw, and Ky's (1993) research, measures of spatial ability have been used as operational indictors of intelligence in a large number of studies. Additional research is needed to examine the effects of music instruction using other global indicators of intelligence. Further, there is also a need to continue comparing music instruction with other types of instruction to determine the degree to which music might be unique in this regard.

Brain research using neuroscientific tools substantiates predictable patterns of brain activity, but without providing the meaning of that activity. Operational indicators, on the other hand, provide rich meaningful information, but employ indirect measures to gather that information. Perhaps the next logical step in exploring the effect of music instruction on cognitive function might be to combine the use of neuroscientific tools and operational indicators to determine whether predictable and directly-observable patterns of brain activity can be associated with specific cognitive abilities.

Motor Development

Although, at the preschool level, girls tend to outperform boys in music-related psychomotor tasks, more research is needed to determine whether such differences persist or fade as students age and/or mature in other ways. Currently, most of the conclusive evidence is with samples drawn from younger populations, foreshadowing the possibility that music involvement at an early age may have a fundamental impact on a variety of different resultant skills. More research is needed at all levels of development to determine the extent to which musical experiences affect motor development.

Emotional Development

Research is needed that investigates the nature of various types of music instruction and how they may impact emotional response. Performance, as explored by Ruggeri (2003), is one type of instruction that, due to its participatory nature, evokes a particular type of emotional response. Judging from the number and popularity of performance-oriented music learning settings, especially at the junior high and high school levels, emotional response associated with this type of learning is quite strong. There is a need, however, to investigate other types or hybrid types of instructional approaches to see how they may impact the emotional development of children. It would also be helpful to revisit Nelson's (1983) work in which he compared Giblin's (1981) theoretical model of affective growth to Piaget's theories of intellectual development. A series of investigations could be conducted to see how a possible alignment of the two theories manifests in the observed emotional development of children.

Beginning in the early 1990's, researchers investigating emotional responses to musical stimuli began using the CRDI as a tool for synchronously measuring responses to musical stimuli. From a broader perspective, there is a need to study the impact of music education on emotional response and development using a wider range of tools than only the CRDI dial. Although the CRDI provides rich and vast amounts of quantitative information, it is but one way to examine a topic that is highly complex and inherently multifaceted. What is needed is convincing philosophical inquiry as well as other types of research into the benefits of emotional development and an exploration into the unique contributions that music and music education may provide.

Social Development

Systematic lines of research over a number of studies are needed to examine particular aspects of music's effect on social development. Investigations could be conducted into how and why such connections occur as well as effects on the development of subsequent skills such as leadership, dynamic co-operative learning, and independent and creative thinking. Additionally,

there is a need to examine how music-learning experiences impact diversity awareness. In an increasingly pluralistic society, it is important for students to develop a greater awareness of others around them. Research is needed to examine how music learning may facilitate such awareness for students as well as long-term impacts on society in general.

Impact on At-Risk Students

Of the studies in which the effects of music instruction on at-risk students are examined, the results are positive but difficult to use as a basis from which to draw conclusions. This is due to the few number of investigations and the disparate variety of approaches across the investigations. Similar to the suggestions for further research into the impact of music learning on social development, systematic lines of research over a number of studies are needed to examine specific aspects of music's effect on at-risk students. Such lines of research need to be of sufficient length and similarity so as to provide the depth of inquiry needed to draw appropriate and valid conclusions.

Impact on Special Needs Students

Similar to previous recommendations, the research in this area needs to be conducted in lines of sufficient length to provide practical information for the therapist as well as clear, objective, patterns of results to the medical field.

CHAPTER SUMMARY

The purpose of this chapter was to present a review of the research pertaining to the impact of music education on several aspects of a child's growth and development, including perception and cognition, motor development, emotional development, social development, as well as on atrisk students, and special needs students. Although individual music education researchers have explored each of these aspects, very few sustained lines of research exist that can be used to support the effects of music education on a child's growth and development. One exception can be found in the area of perception and cognition; however, most of the work in that area has been contributed by non-music researchers.

Perhaps the paucity of investigations from our own research community stems from an effort to avoid substantiating the worth of music and musical education on extra-musical benefits. Such a philosophical "line in the sand" loses merit when adherence to it results in less knowledge rather than more. It is important to continue pursuing new information about the impact of music and music learning on all aspects of a child's growth and development so that we are fully equipped to provide the greatest support to our profession. We, as members of the music education research community, must be equally vigilant that our work be consistently characterized in accurate and proper contexts.

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Footnotes

¹ The Mozart Effect is a registered trademark of Don Campbell, Inc.

4.

THE IMPACT OF MUSIC EDUCATION ON ASPECTS OF THE CHILD'S SELF

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The purpose of this chapter is to provide an overview of the research pertaining to the impact of music education on various aspects of the individual student. The areas of focus of this chapter include attendance, motivation, self-discipline, self-esteem, cooperation, perseverance, attitude, and health. In addition to the aforementioned areas, implications for learning, future research, and policy makers will be presented.

ATTENDANCE

Interest in how to increase school attendance has been a subject of concern for educators and school systems for many years. Justifiably so, for if the students are not in school then how can educators teach them what they need to know in order to succeed? Additionally, attendance rates are often tied to school funding, positively relate to grade point averages, and are inversely related to drop-out rates (Ediger, 1987; Self, 1985). There is a perception among many administrators and educators that the arts can positively influence students to remain in school (Florida Department of Education, 1990). Interestingly, school attendance is usually included in music studies as a secondary variable. Only one study was found in which the relationship between fine arts participation and attendance was the primary focus of the research (Taetle,

1999). However, many studies examining the effects of music on academic achievement did include school attendance.

The importance of daily attendance rates on school achievement is self-evident. Taetle (1999) explored the relationship between high school students' daily school attendance and enrollment in fine arts electives. Students were divided into three groups based on their elective participation: fine arts courses only, non-fine arts courses only, and a combination of fine arts and non-fine arts courses. Taetle found three significant differences: students with lower absentee rates had higher grade point averages; students not enrolled in fine arts elective; and students with low grade point averages who were not enrolled in at least one fine arts elective had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective had significantly higher absentee rates than those students who were enrolled in at least one fine arts elective.

Zanutto (1997) examined the effect of instrumental music instruction on academic achievement of high school students. He compared the academic profiles, including attendance, of instrumental music students to students with no participation in music. Results of the study indicated that instrumental students had better attendance rates with fewer unexcused absences than the students with no music participation.

Cardarelli (2003) investigated the effects of instrumental music instruction on standardized test performance and school attendance of third-grade students. She compared test scores and attendance totals for students participating in instrumental music with those not participating in instrumental music. Statistically significant differences between the attendance totals for the two groups were found. Students participating in instrumental music had better school attendance.

Other studies have found positive effects on attendance at arts magnet schools (McClain, 1996; Taetle, 1999) and for students participating in extracurricular activities including music, athletics and clubs (Barden, 2002). However, one researcher found that the use of continuous background music in a fourth-grade classroom resulted in significantly more student absences than the classrooms with music intermittently or with no music (Kooyman, 1988).

MOTIVATION

Student motivation has been a topic of concern for music educators for many years. A considerable amount of research has been conducted regarding students' motivation to join music and continue studying music. Additionally, researchers have examined the effects of parental involvement, influence of peers, gender, academic achievement, teacher effectiveness, attitude toward music, and self-concept in music on music motivation. However, little research has been found that documents the effects of music participation on school motivation. Does participation in music education motivate students to stay in school and perform better academically?

School Motivation

Olanoff and Kirschner (1969) examined the effect of a music training program on the academic and motivational change of low-achieving junior high school students. Students in the experimental group received vocal or instrumental training for three years, whereas the control group did not. The researchers found no significant differences between the experimental and control groups with regard to reading, math, and study skills scores; grades in language arts, social studies, and mathematics; teacher ratings on attitudes and behavior; or attendance. Interviews with the students in the experimental group indicated that participation in the music

training program led to personality improvement, stimulation to study, and a more meaningful attitude toward school.

An article by Zehr (2003) reported that a school district in the state of Washington used mariachi music classes to engage young Hispanic students academically and deter them from dropping out of school. Students who participate in the mariachi groups say that it has motivated them academically and the district has a very low dropout rate.

Music Motivation

A study by Adderley, Kennedy, and Berz (2003) examined students' motivation to join and remain in music ensembles. The strongest motivating factor reported by students was the influence of their family. The students were either encouraged or pressured by their parents or a sibling to join a music ensemble. A second motivating factor was the students' interest in music as a subject area and exposure to music at an early age. Student statements included "I like music" (p. 3). A third motivating factor was the perception of balance that music provided within the school curriculum. Students wanted the chance to "get away from schoolwork" (p. 3). The fourth motivating factor for students was the social benefit of being in a music ensemble. Students enjoyed the opportunity to feel like they were part of a group.

SELF-DISCIPLINE

One of the major problems facing educators today is the lack of self-discipline among students in the classroom. Characteristics of self-discipline include being in control of oneself, one's conduct, and controlling impulses usually for personal improvement. Without self-discipline, students are unable to stay focused on a single task for more than a few minutes. McDowell (2002) analyzed students' written responses of the value of music in schools and

found that sixth- and seventh-grade students reported that music "teaches self-discipline and character" (p. 2).

In a study of the role of the arts in high school dropout prevention by the Florida State Department of Education (1990), researchers conducted on-site field observations and interviews of at-risk students. Through these observations, researchers found more consistent on-task behavior during arts classes (83.9%) than non-arts classes (73.3%). The highest level of on-task behavior occurred when the students were actively involved in a "hands-on" creative activity. The researchers reported that at-risk students were aware of the amount of discipline required in the arts quoting one student, "It [dance] gave me self-discipline, responsibility, self-confidence and also how to budget my time" (p. 13). Another at-risk student was quoted, "It [music] has taught me that anything is possible, it may just take a greater amount of work and a greater commitment" (p. 40). The researchers concluded "that the arts can be a powerful vehicle for motivating the student at-risk to remain in school" (p. 27). Additionally, they recommend that administrators find ways to incorporate the arts into dropout prevention programs.

Learning through an Expanded Arts Program (LEAP) is a curriculum that helps students learn academic subjects through the use of hands-on experience with art and music (Dean and Gross, 1992). Standardized evaluations of LEAP projects have shown that they are successful. Of students who participated in the program 93.4% developed a better understanding of the subject matter. Also, teachers reported that 93% of the students gained self-discipline, and 97% had a more positive attitude toward school.

SELF-ESTEEM

Self-esteem can be defined as a feeling of pride in oneself and being worthy of respect by oneself and others. Arts participation can have a positive effect on the self-esteem of students

(Florida Department of Education, 1990; Trusty & Oliva, 1994). A report entitled *Toward a State of Esteem* by the California Task Force (1990) stressed the need for arts to be integrated into the curriculum to promote self-esteem. However, research in the field of music education has produced mixed results in regard to how music affects children with normal levels of self-esteem. Some studies show positive correlations between music and self-esteem (Costa-Giomi, 2004; Hietolahti & Kalliopuska, 1990) and others do not (Legette, 1994; Linch, 1994; Zimmermann, 2001).

Costa-Giomi (2004) investigated the effects of three years of piano instruction on children's self-esteem. Children in the study were divided into two groups: piano instruction weekly for three years, and no music instruction. Both groups had similar levels of self-esteem at the beginning of the study. The researcher found that the children who completed three years of piano instruction had a significant increase in self-esteem while the children who did not participate in piano instruction or dropped out of piano instruction did not.

Austin (1990) investigated the relationship of music self-esteem to music activity participation among fifth- and sixth-grade students. Results of the study indicated a significant difference in self-esteem for gender, with a higher mean score for female students. Additionally, the level of musical self-esteem was found to be a significant predictor of participation in music activities.

Zimmerman (2001) examined the effect of playing in the school band on the self-esteem of at-risk elementary students. The researcher found no significant effects on self-esteem based on gender, grade level, or band participation. Linch (1994) found no significant differences in the level of self-esteem of instrumental music participants, students who had discontinued instrumental music, and non-instrumental music participants.

COOPERATION

Whereas many of the courses students take in school involve working alone, the majority of music education programs in the K-12 curriculum involve cooperation. Teachers and students work together to create music and the quality of that music is dependent on each student doing his part. On a daily basis, teachers and students are forced to deal with each other's strengths and weaknesses in a constructive manner if they are to succeed in their goals. As students work together they must learn to accept and respect everyone for who they are, including their personality, race, and nationality. A study by the Florida Department of Education (1990) reported that students who participated in arts activities, "learned how to deal with and have respect for others" (p. 25). Adderley, Kennedy, and Berz (2003) reported that students who participated they felt that they were, "part of something much greater than what the individual could produce alone" (p. 203). To some extent, the qualities that these students learn from cooperation must filter into their daily lives. However, no research has been found to determine the kind of impact that music education has on cooperation or how this affects students' lives outside of their music classes.

PERSEVERANCE

Perseverance is a character trait that is very desirable in education. This trait enables students to keep trying until they succeed at the task at hand. Perseverance keeps students in school even when the going gets tough. Why are some students able to persevere through difficult tasks while others are not? Is perseverance a learned trait or is it innate? Does participation in music education teach students how to persevere through difficult challenges? Only one research study (Scott, 1992) was found that focused on the effects of music on perseverance in other task areas.

Scott (1992) examined the effects of designated activities on attention and persevering behaviors of preschool children. The preschool children, ages three to five years old, were (1) participating in individual Suzuki violin lessons, (2) participating in individual and group Suzuki violin lessons, (3) participating in creative movement classes, (4) participating in preschool classes, or (5) not participating in any organized preschool activity. The perseverance task measured students' perseverance by the time spent replicating a block model. Scott found that the children receiving both individual and group Suzuki violin lessons spent significantly more time (from 7 to 10 minutes) on the perseverance task than did the children in the other groups. Based on the results of this study, the researcher believes that attention and perseverance behaviors may transfer from instructional settings to other problem-solving situations. Obviously, more research is needed on this important topic.

ATTITUDE

Music is very important in the lives of school age children. Listening to recorded music is one of the most popular pastimes of pre-teens and teenagers. There are studies that show music is one of the most popular areas of the primary school curriculum; however, it becomes one of the least popular in the secondary school (Harland et al., 2000). What is responsible for this shift in music attitude? One explanation for this decrease in student interest is the cultural gap that exists between the music that teenagers listen to outside of school and the music content taught in secondary schools (Boal-Palheiros & Hargreaves, 2001). Music educators and researchers need to find a way to bridge this "cultural gap" to keep students of all ages interested in studying music.

Tilton (1983) investigated the relationship between fourth, fifth, and sixth grade students' attitudes towards the arts and grade level, duration of instruction, and gender. The results of the

study indicate that students who participated in the arts had a more positive attitude toward the arts than their peers who did not participate in the arts. Fifth grade students had a more positive attitude toward the arts than both fourth and sixth grade students. Also, the most positive attitude toward the arts related to duration of instruction was at the end of two years. Girls were found to exhibit a significantly more positive attitude toward the arts than boys.

Seidenberg (1986) examined the preferences and attitudes of middle and secondary school students towards music in school. He found that sixth grade students were very positive toward music in school, eighth grade students were negative, and tenth through twelfth grade students were neutral toward music in school. Other factors that affected students' attitude toward music in school included outside of school music experience, home musical environment, and gender.

HEALTH

When the Boston School Committee of 1838 was debating whether or not to include music education in the public schools, they asked themselves this question, "Is it intellectual – is it moral – is it physical? Let vocal Music be examined by this standard" (Boston School Committee, 1838, p.1). As the Committee examined the physical role of music, they went on to say, "It appears self-evident that exercises in vocal Music, when not carried to an unreasonable excess, must expand the chest, and thereby strengthen the lungs and vital organs" (Boston School Committee, 1838, p.1). Obviously, the issue of health and music education is not a new one, and yet, there is very little research documenting the impact of music education on the physical health of normal school-age children. Why, after 150+ years of music education in the public schools, has this topic not been addressed by our profession?

Impact of Music Education on Health

There was no literature found within the music education journals that examined the direct effect of music education participation on the health of students. A study by Harrison and Narayan (2003) in *The Journal of School Health* investigated whether participation in school team sports, exclusively or in combination with other extracurricular activities, including music, was associated with higher levels of psychosocial functioning and healthy behavior than participation in other extracurricular activities alone or nonparticipation. The participants in the study included 50,168 ninth grade public school students who participated in a statewide voluntary survey. Students were categorized into one of four groups: (1) sports only, (2) sports and other activities (including band, choir, music lessons, clubs, and volunteer work), (3) other activities only, or (4) no participation. The researchers found that students who participated in sports, either alone or with other activities, were associated with adequate exercise, milk consumption, healthy self-image, and had a lower likelihood of emotional distress, suicidal behavior, familial substance abuse, and physical and sexual abuse histories. Students who participated only in extracurricular activities, including music, had a unique association with doing homework/studying and avoiding alcohol use, marijuana use, and vandalism.

Musician's Health

Musicians' health is an emerging issue on college campuses and with professional musicians, but has not yet filtered down to the K-12 public schools. There are studies that target hearing health (Mace, 2005), vocal health (Greenwood et al., 1999; Smith & Sataloff, 2003), neuromusculoskeletal health (Dawson, 2005; Logue et al., 2005), and mental health (Jacobs & Dodd, 2003; Scheib, 2003) of professional musicians; however, the field of music education needs research that focuses on these same issues within the K-12 curriculum. What detrimental

effects, if any, does music have on the child's health and how do we, as a profession, overcome those effects?

SELF-IMAGE

A healthy self-image is important for all children. Educators want children to feel good about themselves and have a feeling of self-worth, but what can we do to help children develop a positive self-image? Several studies have documented the formation of subcultures by adolescents in their schools (Cotterell, 1996; Cusiak, 1973; Kinney, 1999). Morrison (2001) identified music as one of several closely knit subcultures and suggested that ensembles are, "a culture that informs and enriches the lives of their members" (p. 24). One can only assume that being part of such a subculture in some way affects a child's self-image. In what way does music education affect the self-image of school-age children? No research studies have been found that investigate the impact of music education on the self-image of school-age children.

IMPLICATIONS FOR LEARNING

The subsections included in this chapter are all qualities that enable a child to succeed or fail in school: attendance, motivation, self-discipline, self-esteem, cooperation, perseverance, attitude, health, and self-image. Not only are these characteristics important in learning, but also in life. Once these traits are learned, either positively or negatively, they will stay with the child throughout his or her life.

Many students who participate in music education programs already possess many of these characteristics, either through support from their family or from their music ensemble "family". But, what about the children who do not participate in music education? We know from the literature that participation in music education declines rapidly after elementary school. So, we, as a profession, are not reaching students when they need help the most—during the teenage

years. Throughout the teenage years many students are subject to ridicule, harassment, and discrimination, which can result in low self-esteem and self-image. If participation in music education can help to combat some of the negative aspects of life that contribute to poor self image, then we need to find a way to involve all children in music at all age levels.

IMPLICATIONS FOR FUTURE RESEARCH

There has been very little research within the field of music education that has focused on the impact of music education on the various aspects of the self. Future research is needed and strongly recommended in all of the following areas: attendance, motivation, self-discipline, self-esteem, cooperation, perseverance, attitude, health, and self-image. More research in these areas would contribute not only to the knowledge base in the field of music education but also to the field of education as a whole. The insight gained from music education studies such as these could influence students, parents, educators, administrators, as well as school curricula.

IMPLICATIONS FOR POLICY MAKERS

Policy makers need to realize that music can not only have a powerful impact on student learning, but also on the characteristics of the self that allow a child to learn. Qualities such as self-esteem, self-discipline, and perseverance can be learned through participation in music. It is assumed that these qualities will carry over into other academic areas. At this point, we do not know whether participation in music education affects student motivation in other academic areas, but motivation to participate in music class may keep students coming to school. Students engaged in music education often have higher attendance records that those who do not participate. More research is needed on the affect of music education on health, but one study (Harrison & Narayan, 2003) found that participation in extracurricular activities, including

music, resulted in students who studied more and participated less in deleterious activities such as drinking alcohol and smoking marijuana.

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5.

THE USES AND FUNCTIONS OF MUSIC AS A CURRICULAR FOUNDATION FOR MUSIC EDUCATION

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The University of Minnesota

This chapter explores a model of music education that may help the profession make progress toward its oft-stated goal of meaningful music education for every child. A related, more recent slogan might be "No child left behind." A major premise is that the basic functions of music—for example, those explicated in Alan P. Merriam's (1964) classic text The Anthropology of Music—can provide a motivational contemporary basis for all modes of music education at all levels of schooling. It is hypothesized that virtually all students in all music education settings can be engaged to learn the vital personal and social aspects of music and related subjects by studying this art form's potential uses and functions in their own daily lives.

Several scholars have shown interest in the societal functions of music education. Among them are Max Kaplan (1990), who himself grouped music's uses into eight social functions, and E. Thayer Gaston (1968) who provided a basis for music therapy with his eight "considerations" about the functionality of music. Other authors include John Blacking (1995), Patricia Campbell (1991), and Christopher Small (1977). Merriam's ten functions of music will be used as the prime example in this chapter because of his extensive and cross-cultural research that, despite the age of his text, remains timely, worthy, and overdue attention. These musical functions include: *communication; emotional expression; symbolic representation; aesthetic satisfaction; entertainment; physical response; encouraging conformity to social norms; validating social*

institutions and religious rituals; contributing to the continuity and stability of culture; and *contributing to the integration of society.* Note that there is nothing mystical about the number "ten." This is simply where Merriam's research took him. Others might define more or fewer functions depending on their own reading and grouping of the cultural realities.

Not many years after publication of his landmark text, Merriam lost his life in a plane crash returning from a research expedition in central Africa. At the time of his death Merriam's work was quite unknown to most music educators, mainly because he did not feel personally qualified to address issues of music education (but note the proximity of his text to the time of the Tanglewood Symposium). When invited to speak to music teachers about his work he declined with the excuse that he was not a pedagogue and thus had nothing to offer. However, through the years music educators have begun to discover and benefit from his work, particularly in the basic matters of the social uses and functions of music media in daily living—among other still unrealized goals of Tanglewood.

The suggestion here is that it is time to do what Merriam did not feel competent to do, that is, to employ his work in the research and development of curricula that are socially based and rooted in cross-cultural anthropology. This does not mean that the guiding slogan of the profession for almost a half-century, "Music education must be aesthetic education," need be routinely abandoned—but it must be greatly broadened. In Merriam's research the aesthetic function is recognized as one of ten, and some educator-researchers are beginning to believe that to focus or limit our curricular base to a single function is to limit the usefulness of music education in the lives of our young people. Broadly viewed, functions provide a curricular base that can support and enhance any and all classroom and performance music offerings, including

those with a "National Standards" orientation. The amalgamation of the Standards and "multifunctional" music education is exemplified in the last section of this chapter.

Research into the social functions of music *per se* is limited, and research on the curricular and pedagogical potentials of functional music education is virtually nonexistent. Thus the following section on related literature will simply provide an example of research in each functions area. The introductory paragraph for each area relates to researchable ideas found in the writings of Merriam (1964), Gaston (1968), Kaplan (1990), Campbell (1991), Haack (1997, 2000), Hodges and Haack (1996), Radocy and Boyle (2003) among others included in the chapter bibliography. The concluding sections of the chapter will then provide implications for teaching and learning, and examples of curricular applications for further research and development.

RELATED LITERATURE

To begin, it may be helpful to consider a distinction between a musical use and a musical function. In Merriam's terminology, a function is a broad, basic, underlying purpose for engaging in and experiencing music, while a use is a specific instance or application of a function. Thus, music can serve the functional purpose of "emotional expression" when one is using music to sing of love in the moonlight under the balcony of the beloved. Similarly, music can function as "symbolic representation" when used as a school song or when we hear the national anthem at a ball game. The premise here is that the uses and functions of music are never non-musical or extra-musical events as sometimes termed. If music is involved in the experience, it is a musical experience, or at the least a music-related experience, one informed by potentially meaningful music.

As we view each of the functions under consideration, we may realize that they are by no means discrete. For example, there could be considerable overlap between the uses and functions of music as communication and music as emotional expression, or between music that functions to validate social institutions and music that fosters the continuity and stability of a culture. In fact, it is even possible that a single piece such as the "National Anthem" could serve all of the functions in a variety of use situations.

The Musical Function of Communication

We can consider music functioning as a means of communication—communication of feelings through feelingful forms of sound, through musical ideas beyond words, through associations, through verbal (lyric) enhancement, including commercials, and various other sorts of propaganda. We realize that musical communications tend to be beyond mere words, thus sacrificing precision of meaning for subtlety of expression. Even persons from the same culture can derive somewhat different meanings from musical communication because of the subtle and sometimes not so subtle experiential and biological differences they bring to the musical interaction.

An example of research in this realm is "The effects of background music on viewers' perceptions of political campaign television advertisements" (Wilson, 2003). Almost 300 college undergraduates in three sociology classes reacted to three negative campaign ads, One had congruent music (generally an unpleasant or harsh treatment of elements), another had incongruent music (a more positive, generally pleasing treatment of elements), and one had no music. Response forms involved a numerical scale but also sought open ended reactions for content analysis. Two of the three classes that comprised the study indicated significant differences in their responses favoring the incongruent, positive music condition over the

congruent music condition. No significant differences were found for political affiliation, gender, age or years of musical experience.

The Musical Function of Emotional Expression

We can readily observe music in its functioning as emotional expression. Indeed, this is an area in which quite a bit of research exists; though there still is not much that closely addresses the matter of societal uses and functions. Certainly expressions of love have long been enhanced by empathetic musical settings, as has patriotic music in all its exuberant and/or reverent affect. Moods of joy and sadness, social concerns and protests, and myriad other things too complex or difficult to just say have made music a human necessity in the realm of emotional expression.

An example of research in this functional area is "Children's perception of the emotional content of music" (Trunk, 1981). Fifty-five five to eight year old children were each given three related exercises. Their first effort was to recognize four facial expressions: happiness, sadness, anger and fear. They were then to recognize the appropriate facial expression for the sentiments expressed in eight brief stories. In the same manner, the final task was to identify the emotional qualities of eight brief musical examples. Significant effects for types of emotion were revealed in all three tasks, happiness being the most readily identified in each. No gender differences were indicated; however, in the music task there was a significant main effect for age. This led the researcher to speculate about a learning theory aspect in the emotional perception of music by children. The researcher also felt that, according to the findings, perception of emotions is a generalized ability that can be applied to domains outside of social interactions, domains such as music.

The Musical Function of Symbolic Representation

Music functioning as symbolic representation may be used to relate ideas through musical characteristics or via associations gained through joint experiencing. Things susceptible to symbolization include places such as schools, countries or regions thereof, types of activities or rituals, time of day or era, particular occasions, ethnicity, individual or group characteristics, as well as the ebb and flow of human feelings.

"Collective memory in a transition society" (Dumbrava, 1998) is a study of the function of symbolic representation in matters such as the national flag and national anthem of Romania after the revolution of 1989. After consideration and discussion of sound symbols, the study compared the recollections of 48 subjects about two patriotic songs: one had no apparent political ties while the other had strong political implications. General recall, as well as detailed recollections, was stronger for the neutral song than the political song. The researcher speculated that the political song memories may have been affected by people's intense repression of symbols related to the former regime's acts of ideological aggression.

The Musical Function of Aesthetic Satisfaction

Aesthetic experience with music may range from feelingful awareness to theoretical analysis, depending on one's philosophy and focus. The Greek root of the term relates it to perception, and perceptual emphases may include the contemplation of beauty, order, or formal tonal relationships through thoughtful-feelingful interactions with musical stimuli. The fact that not all cultures have a clearly voiced or analytical aesthetic does not mean that they do not have aesthetic experience. Much of the earlier work in this area is of a philosophical or speculative nature, and only in recent decades have we begun to emphasize action or data-based investigation of musical responses in the functional realm.

"Effects of rubato magnitude on the perception of musicianship in musical performance" (Johnson, 2003) is an investigation of a very specific and often subtle aspect of aesthetic expression. Subjects rated the musicality of six excerpts having varying degrees of rubato. The excerpts ranged from no rubato through a moderate level, as determined by previous research, to three excerpts that ranged beyond the moderate into the extreme. The moderate excerpt was judged most musical, closely followed by the next two greater levels of rubato. Less and no rubato excerpts as well as the maximum excerpt were judged to be significantly less musical. The researcher speculated that rubato is an important and teachable aspect of musicianship, and one that warrants more attention in the expressive aesthetic realm. Cross-cultural studies would be of interest.

The Musical Function of Entertainment

A highly lucrative, worldwide industry has grown around the uses of music for entertainment. In this case entertainment refers to life's more simple enjoyments, amusements or diversions, and music that fosters such uses is generally of a more simple structural nature yielding more immediate feelingful experience. Granted art music may be used for entertainment or even background purposes, and popular music may be regarded quite seriously in the aesthetic sense, although they usually function in the reverse. In its generally more simple, direct form, popular or entertainment music is a readily agreeable and more accessible, immediately pleasurable form compared to the more complex stimuli characteristic of aesthetic or art music.

Berger and Cooper (2003) designed a ten-week music education program to gather data for their research titled "Musical play: A case study of preschool children and parents." Eighteen preschoolers and their parents were the prime participants. The goal was to learn more about how preschoolers entertain themselves and others via their explorations with sound in both free and structured play settings. The observation data revealed conditions that interrupted, modified, or enhanced children's play. It was determined that children needed extended, uninterrupted periods for play, as well as appropriate musical play resources, and that they were able to communicate their need for musical play through words and gestures directed toward other children and adults. Adults' attention and valuing of children's musical behaviors, along with flexibility in lessons, enhanced the quality of children's free musical play.

The Musical Function of Physical Response

Many examples of the use of stimulative music (generally music that is faster, louder, with more rhythmic energy, etc.) and sedative music (generally music that is slower, softer, less energetic, etc.) may be found in the functional realm of physical response. Music seems to lend endurance and coordination to physical activity. All societies employ music to facilitate dance, and these two activities might be considered the first integrated arts form. Music can be used to energize a multitude of activities such as marching, running, and aerobic exercising. It may be used to excite and channel group or crowd behavior. Importantly it also may be used to facilitate relaxation, rest, and sleep. From stimulative to sedative, from dance to trance, music functions in the realm of physical activity.

Rickard's (2004) study titled "Intense emotional responses to music: A test of the physiological arousal hypothesis" employed a variety of physical response measures for data. The goal was to learn whether intensely emotional music yielded notably higher levels of physical arousal than less energetic or potent music. Subjects experienced a relaxing excerpt, a moderately arousing excerpt, a piece rated emotionally powerful by the participants themselves, and an emotionally powerful film scene. The emotionally powerful music elicited significantly

greater galvanic skin responses and chill effects than the other musical and film treatments. The appropriateness and effectiveness of the several measures was discussed in some detail.

The Musical Function of Encouraging Conformity to Social Norms

Many are not aware of the degree to which music may encourage and even enforce conformity to social norms. Songs with memorable, repetitious musical content teach and inculcate mainstream values and behaviors. Children's songs often are used for purposes of social control and commentary. Traditional folk songs as well as specially devised songs are used in the early school years to teach and reinforce proper behavior. Behaviors, attitudes and knowledge are conveyed in the song materials employed by the likes of Sesame Street and Mister Rogers. Of course, sub-cultural music values may be used to counter the mainstream as well. Music has the potency, but people determine and impart the direction of its use.

Music that encourages conformity to social norms is one of the aspects examined in Tracy's (2001) study titled "Pre-teen girls' popular music experiences: Performing identities and building literacies." The study employed ethnographic methods with girls in an urban elementary school to learn more about their musical encounters, how those encounters impacted identity construction, and how their musical interactions were imbedded in their everyday lives. It was found that, in their singing and dancing, they communicated their racial, gendered, and age related identities. Prevalent common identity aspects were "acting your age," "acting your color," and "gendered allegiances." Their identity performances helped these pre-teens gain belonging and group cohesion.

The Musical Function of Validating Social Institutions and Religious Rituals

Music is thought to be a powerful source of validation for the many social institutions and religious rituals that employ it. Overlapping with several earlier and forthcoming uses and functions, we find validating qualities in patriotic music, in school songs, and in music of ethnic identity. Political, athletic and social events are often linked to music: "Hail to the Chief" is an essential part of a presidential inauguration; we cannot begin a baseball game without the singing of "The Star Spangled Banner;" and a birthday event is not properly done without the singing of "Happy Birthday." Congregational singing lends official status and reinforces religious activities of all kinds. In some denominations, weddings must include traditional processional and recessional music to make the ceremony truly "right." Holy days as well as holidays have their validating anthems, sacred and secular, such as "Silent Night" and "White Christmas."

"Little red songbook: Songs for the labor force of America" (Volk, 2001) is an historical study of one aspect of the role of music in the labor union movement of the early 20th Century United Sates of America. "Colleges" were established to train union leaders, and music was employed to sanction and validate the labor movement in general and the "colleges" in particular. Other musical functions such as communication (about the nature of unions), emotional expression (about the need for unions), physical response (music to accompany marches/parades), and integration of society (to gain broader support) were important as well. However, to have the validation of one's own published songbook and all the pieces therein was of significance psychologically for the fledgling unions and their training institutions in their quest for recognition as valid social entities.

The Musical Function of Contributing to the Continuity and Stability of Culture

Music is thought by some to make a vital contribution to the continuity and stability of culture, often through activities noted in the prior functional area. Music helps to perpetuate, or modify in an orderly manner, cultural values and attitudes. Ethnic folk songs and dances provide a cultural link to the past. Traditional music, Christmas carols for example, can provide cultural

stability across generations and eras. However, music also can help a society realize its movements and directions by providing artistic experiences wherein a psychic distance may be maintained to lend objectivity. Even music that fosters outright change can do so in a more orderly, face-saving, and relatively non-threatening manner.

While many facets of cultural continuity and stability are thought to be facilitated by music, the music culture itself is the phenomenon under investigation in Custodero and Johnson-Green's (2003) study titled "Passing the cultural torch: Musical experience and musical parenting of infants." Their survey drew 2,250 respondents who were parents of four to six month old infants. Five types of experience were investigated: (1) recollections of their mother or (2) father singing to them, (3) playing an instrument, (4) singing in a choir, and (5) taking music lessons. Not totally surprising, data analysis revealed that parents' memories of early musical experiences did indeed matter in their own parenting behaviors. It was much more likely that parents who had themselves been parented musically would sing and play musically with their infants to a greater extent than parents lacking such early musical experiences. Further, the strong association between singing recollections and musical parenting was not surprising given the intimacies of early childhood interactions. Generally, support was noted for the notion that parents are more likely to provide their children with musical experiences similar to their own, thus providing continuity and stability, not unlike that found in other aspects of culture.

The Musical Function of Contributing to the Integration of Society

Music is understood by some to be particularly useful in the integration of society. Indeed Merriam (1964) speculated that this may be the most important of music's social functions. Gaston (1968), too, makes a point of music's ability to bring people together, to make individuals feel a part of the group; for example, hymn singing that draws a diverse gathering of

persons together in a common experience of worship. Certain pieces of music (such as "The Star Spangled Banner" and "Take Me Out to the Ballgame") almost demand participation, and in so doing, they bring together persons from varying backgrounds in a common musical and social experience.

In "Common songs of the cultural heritage of the United States: A compilation of songs that most people 'know' and 'should know'" McGuire (2000) analyzes recent attempts to find songs common to the heritage of the United States. An immediate and enduring challenge is to find agreement on what it means to "know" a song. Another is to identify songs that are truly national and not mainly local or regional. [Chapter author's note: The desire for a "common book of song" for the United States remains a most worthy one in our ongoing quest for the integration of society. Even as we take pride in our diversity we realize the need for a balance of common, basic values, and it is hypothesized that music may well be the prime vehicle in helping to bring about the desired integration and drawing together of our nation.]

Functional Music Education

This related literature sampling concludes with mention of two studies that touch on the sparsely researched functional music education aspects of curricular development and pedagogy. In "'I feel therefore I am': Selected British and Canadian senior high school students' conceptions of music and music education," Thompson (2001) explored the roles that music plays in students' lives. Interestingly, most of the functions discussed above are represented in the roles identified in the study. The interviewees, over 30 from each side of the Atlantic, were found to use music to transfigure reality, for emotional communication, and to symbolize their needs and desires for liberty, honesty, mystery and hope. The researcher concluded that understanding more about adolescents' conceptions and uses of music could help educators

broaden both music-centered and/or human-centered curricular emphases so that students' conceptions of music, society, and themselves, could be holistically engaged and challenged.

"Music education in culture: A critical analysis of reproduction, production, and hegemony" (Rose, 1990) grew out of the researcher's belief that music, education, and society were interdependent and not isolated phenomena. Rose's research proceeded through several stages of interviews with representatives of different types of music-related agencies. Responses were subjected to analysis based on concepts of critical theory. Several conclusions that relate to the concerns of this chapter were drawn. It is possible that music can effectively aid the formation of students' social and cultural consciousness. Although existing school music offerings remain heavily reproduction oriented in the music ensemble sense, there is potential for today's music teachers to promote and foster more creative, productive modes of music education-and of music related culture. However, teachers and their institutions need to be fully aware of the vast power that music has in cultures and thus in societies. This is entirely congruent with Merriam's conclusion that "Music is clearly indispensable to the proper promulgation of the activities that constitute a society; it is a universal human behavior..." (1964, p. 227). Rose concludes that in the realm of critical pedagogy there is the ability to get rid of limiting, self-generated music education practices, and become free to explore with students the extraordinary functionality and importance of music in society, and in daily living.

IMPLICATIONS FOR TEACHING AND LEARNING

We can find a succinct but very potent rationale for music and thus music education in the statement, "There is probably no other human cultural activity which is so all-pervasive and which reaches into, shapes, and often controls so much of human behavior" (Merriam, 1964, p. 218). This statement is particularly forceful when we realize that it comes not from a music

educator with vested interests, but from a respected cultural anthropologist. The statement not only advocates for music education, but moreover for a multi-functional, cross-cultural music education. [Much of what follows is based on or drawn from the author's papers cited among the chapter references.]

The need to explore new paradigms in music education does not come because we turned a page on a calendar and found ourselves in a new millennium, but because of the tremendous and at times overwhelming social and technological developments of recent decades. At the beginning of this chapter it was hypothesized that a multi-functional paradigm could provide a timely and effective 21st Century curriculum base for music education. Several correlative premises follow. First, music is a multi-faceted aspect of human behavior, that is, it can be useful in fulfilling many vital human needs. Second, the practice of music education should reflect the nature of music, *and* the nature of human interactions with it. Third, the aesthetic function is a vital one, but just one of several.

Admittedly the functions explored herein are not mutually exclusive, and are somewhat arbitrarily titled, so that one could readily have fewer or more than ten; but this is where Merriam's particular research led him. In any event, curricular thinking in terms of functions may be particularly valuable because they cross cultural boundaries, while uses, specific expressions or instances of these functions, often are more culture bound. Understanding functional similarity as well as use uniqueness from culture to culture can make students more aware of the ways that music "works" in their culture as well as others. In the process students can learn about the influence of various musics on their own attitudes, values and behaviors. This kind of "cause and effect" learning can lead to their developing a repertoire of music and musical understanding that enables them to discriminate, choose and use music wisely in light of their personal needs and their knowledge of musical causes and feelingful effects. Thus students develop skills and understandings that foster effective interactions with music not only in the aesthetic sense but also in the entire realm of musical functions.

Education of such a comprehensive, multi-functional nature is essential precisely because music is such a powerful, pervasive and persuasive aspect of living in today's world. Given the ubiquity of music and the nature of life in a free, democratic, capitalistic society, young people need the tools, the *functional literacy*, to choose and use music wisely. They need to be able to program their own world of sound to meet their own varied needs, rather than be peer-pressured into a limiting "one size fits all" music mentality, or be bound to the dictates of the commercial media music programmers. Yet, uses and functions of popular music styles cannot be ignored; for example, when asked what was the most powerful computer, Bill Gates responded "that which is most used." May not the same be true of music?

Indeed, today many parents are becoming as concerned about the music in the lives of their children as about diet, drugs, sexual promiscuity, and other influences on their well-being. Indeed many of these are music-related topics; topics that health educators have taken on with the approbation of society. Is there an interdisciplinary role for music education here?

For an analogy with some merit, consider chemicals and music: both are at the very essence of our physical or psychological being; both can beautify or pollute environments; both can bring about powerful mind, mood and behavior changes, and both can be employed to enhance the human condition or to harm it. Students need to know that any entity that has the power to do the many marvelous, uplifting things that music does for individuals and societies, can also be used for inhumane and socially negative purposes such as promoting unhealthy life styles, violence, mind controlling propaganda, or conveying and inculcating racial and gender biases. Students need to be aware that music is much more than an incidental, benign phenomenon. They need to understand it as a potent, pervasive, but morally *neutral* force—humans put the moral spin on it to influence the behaviors of others for better or worse. Music's halo effect, the Gutenberg complex and the inability to *see* sound all add to the confusion about music's reality.

Generally society looks to the assistance of education to encounter such concerns, yet our current curricula seem to ignore such opportunities. Consideration of such matters can arise quite naturally in a functionally based curriculum. In terms of advocacy, when music education takes on obviously important social concerns, society will regard it as important.

In addition to curricular concerns, the amount of student involvement in music, particularly at the secondary level, hints of a deficit delivery system. Classrooms and rehearsal rooms seem unable to compete with the constant and consequential real world musical environment—one often orchestrated by commercial and technical experts with millions of dollars at their disposal. Yet, with the assistance of the music industry and a contemporary curriculum, competitive technology could be devised so that every child could indeed have access to a creative and exciting real life music education.

EXAMPLES OF APPLICATIONS IN NEED OF RESEARCH

The curriculum examples provided here are hypothetical in the sense that none have been researched. That is understandable given the novelty of the premise and approach; however, a substantial research base will be needed to persuade and warrant the changes in teacher preparation, curriculum, and related teaching/learning resources that will be required to bring a new paradigm into existence. Thus what follows is some pump priming with several curriculum ideas for trial and testing.

For a simple and practical curriculum example, each of the functions could provide the topic for a unit in the context of a middle or junior high school general music class. The basis of the teaching methodology would be "to live the various functions of music" so as to learn how they work in real life. This means introducing and discussing a function, hearing musical examples (uses) of it, understanding the function in terms of its underlying purpose(s), and then making practical applications of it with musical examples in actual use situations. Thus we are involving students in thinking/feeling activities and experiences relating to a variety of music functions, and having them find or create music with the right formal properties to be effectively expressive in specified use circumstances.

Note: As music educators we often seem inclined to emphasize thinking about formal properties of the music, or, about the feelingful effects of the music, rather than examining the interactive nature of both aspects in terms of cause and effect relationships. If we do not help students relate the formal properties of a piece to the feelingful effects of that music in a specific use situation, quite likely we are not empowering them with the necessary understanding for creative musical behavior and problem solving.

So, for each functional area under study, students could: (1) Hear and respond to more and less appropriate music for a given context and discuss the formal/feelingful potentials of the music in terms of the desired function. (2) Find and perform, analyze and defend, again in the formal/feelingful sense, music that they believe to be useful and effective in achieving the underlying purpose or function being studied. (3) Create and perform appropriate and effective music for use in a given context and functional realm. Note the potential usefulness of the National Standards activities in such a plan.

By way of further example, in the functional areas of communication and physical response to stimulative and sedative music: (1) Have students hear and discuss their responses to various bugle calls. They might contemplate the incongruities of using one with a fast tempo and staccato articulation such as "Charge" or "Reveille" to communicate lights out—go to sleep or for use at a military burial ceremony. Similarly, they might imagine the effect of using a call with a slow tempo and legato articulation such as "Taps" for awakening people and rousing them to action. (2) Find and sing or play other calls, cheers, and so on, and analyze them in terms of their formal/feelingful properties and purposes. (3) Then create or improvise some new, alternative bugle calls to communicate the desired physical responses and reactions. This creative activity might be extended to devising a trumpet cheer for an athletic event. Assess success: Did the cheer get the desired attention and crowd reaction? Did it channel and coordinate their response? Did it provide the student body with an effective cue after only a brief rehearsal at the pep rally?

Obviously the above example could be incorporated into performance classes as well. Another example could be incorporated into the ensemble setting wherein a composition currently being rehearsed would also be analyzed for its effectiveness in fulfilling the function or functions it was designed or suited for. In the process of discussing and determining possible functions, various expressive and stylistic interpretations could be tried to find those that are most effective in light of the underlying purpose of the piece.

For an example in the instrumental ensemble area, have the band or orchestra students play and discuss the effects of appropriate and inappropriate tempi and dynamics for a processional to be used for their school's graduation ceremony. This experimentation could then be extended to an analysis/discussion of the musical elements, characteristics and treatments that bring about the desired feeling tone and functional effects of such a processional (including physical response, symbolic representation, social conformity, validation of rituals, and possibly others).

As mentioned earlier, there is nothing magical about "ten" basic functions, and more or fewer might be identified. In fact, part of the teaching process might have students defining their own more or less discrete functions as a valuable learning exercise in and of itself.

Thus the overarching goal of such a curriculum paradigm is functional literacy, or cause and effect music education, defined here as knowing how music works; that is, the ability of students to understand musical uses and functions, and therefore to choose and use music wisely and well in their own daily lives. On with the research.

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6.

THE IMPACT OF MUSIC EDUCATION ON HOME, SCHOOL, AND COMMUNITY

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GOALS

The purpose of this literature review is to provide a broad overview of the impact of music education on the home, school, and community environment. The literature included encompasses attitudes, burden of music instruction such as extraneous noise, space, and so on, beliefs of the value of musical involvement, quality of life, public relations value, and the identity of family, school, and community. These factors guide the entire review process of this chapter.

REVIEW PROCEDURES

Resources

The resources of the University of Miami Libraries were employed to implement extensive searches of published literature on the impact of music education. The University of Miami Libraries provides access to over 270 electronic databases covering all areas of human endeavor. Of particular usefulness to this effort were the electronic databases of Silverplatter that include PsycInfo, Mental Measurements Yearbook, Exceptional Child Education Resources, and ERIC, RILM Abstracts of Music Literature, Music Index Online, CSA Illumina that includes Sociological Abstracts, and the Social Science Citation Index. In addition, the Frost School of Music is home to the Music Education Search System a reference database of every major refereed journal in the field of music education published in the United States. The number of citations in this database now totals more than 17,000.

Process

Three research assistants with significant research and publication experiences were assigned a particular area: home, school, or community. They then separately searched through databases and other research resources looking for published works that included the word "music", the particular area, and other keywords that might bring forth references that incorporate those factors the review was to encompass. Weekly meetings were held between the three assistants and myself to monitor progress, to share insights, and to enhance the review process. The results of extensive search efforts yielded very few references that specifically detailed the impact of music education on home, school, and community. As a check on the small number of identified references, the indices of the two handbooks of music teaching research (Colwell, 1992; Colwell & Richardson, 2002) were examined. These two works offer some of the most comprehensive literature reviews in the field of music education. The terms "home" and "school" are not listed separately in either index. The term "community" is listed in the index of the more recent volume. In short, it appears that these entities have not been of great interest to researchers in the field.

Confirmatory Review

To confirm the paucity of findings obtained by the research assistants, I conducted an independent literature search. The indices searched and the keywords used for each search are listed in Table 1. The searches were adapted to each database to fit the characteristics of the search engine. The searches targeted directly salient references to the impact of music education on home, school, and community. Very few references were found.

Table 1	
Confirmatory Literature Review	

Indexes Searched	Keywords
Dissertations On-Line	Music in Title and (home or school or community or society)
ERIC	Music and (effect on home or effect on school or effect on community or effect on society)
	Music and (impact on home or impact on school or impact on community or impact on society)
	Music and social effects
Music Education Search System	Music and (effect on home or effect on school or effect on community or effect on society)
	Music and (impact on home or impact on school or impact on community or impact on society)
	Music and social effects
Music Index	Music and (effect on home or effect on school or effect on community or effect on society)
	Music and (impact on home or impact on school or impact on community or impact on society)
	Music and social effects
RILM	(effect on school) or ((effect on school)or(impact on school)) or ((music education)and(effect)) or ((music education)and(impact)) or ((impact on society)or(effect on society)) or (social outcome) or ((impact on community)or(effect on community)) or ((impact on community)or(effect on community)) or ((impact on home)or(effect on home))
Sociology Index	Music in Title and (home or school or community or society)

IMPACT OF MUSIC EDUCATION ON THE HOME

Home Environment and Learning

Home environment has long been known to be one of the most influential factors on student learning (Garber & Ware, 1972; Olson, 1984; Shapiro & Bloom, 1977). Influences of the home include socio-economic status, enrichment, parental attitude, genetics, and the like. These

influences have been cited as accounting for up to 80% of the variance in learning. It is in the home that students learn attitudes toward learning and school (Revicki, 1981), where achievement motivation is learned (Palmer, 1967), and from where parental involvement, that is so influential in student learning, emanates (Slaughter & Epps, 1987). Genetic factors have been shown to explain 25% of the known relationship between home environment and achievement (Cleveland, Jacobson, Lipinski, & Rowe, 2000).

The major influence that the home has had on student achievement has been shown for reading (Anglum, 1990; Dolan, 1983), mathematics (Crane, 1996), and science (Abeti, 1983; Gorman & Yu, 1990). Characteristics of the home environments of high achievers are supervision, organization, parental involvement, and parental communication (Diaz Soto, 1988). Importantly, it has been shown that positive changes in the home environment can produce increases in academic achievement (Kalinowski & Sloane, 1981).

The importance of the home environment on student learning is apparent from this brief summative review. Brand (1986) studied the impact of the home musical environment on student musical learning. As part of this project, Brand developed the Home Musical Environmental Scale that measured parent attitude toward music, musical involvement with the child, concert attendance, ownership and use of recordings, and whether a parent plays an instrument. When this measure was used with assessments of tonal and rhythm perception, musical knowledge, skill in musical performance, music reading, and motivation for music it was found that home musical environment was strongly related to musical achievement of the second grade students involved in the study.

Students know the importance of the home in music learning. Using statements students wrote about what caused success and failure in music, Asmus (1985, 1986) found a clearly

delineated family background factor. This factor included statements such as "having musical parents," "having relatives who are musical," "starting music when you are very young," "having music run in your family," and "being able to afford a good musical instrument."

The home environment can be altered by the presence of music (Shiraishi, 1997). Music has been shown to be an effective method for relieving stress, curbing anxiety, reducing depression, and enhancing self-esteem. When music is systematically presented within the home environment, positive effects can be noted in family members.

Effect of Music on Child Development

Hanshumaker (1980) performed a comprehensive review of the literature on the effects of arts education on intellectual development. His review indicated that children value music activities, music fosters positive attitudes toward school, music results in lower rates of absenteeism, music contributes to the development of creativity, music positively influences social development, and music activities have a positive effect on general intellectual development. The literature reviewed also indicated that school time spent on music activities does not negatively impact scores on standardized tests or overall grade point average. Higgins (1966) noted that participation in high school band neither positively or negatively effected academic achievement or social adjustment. Student involvement with music in school settings has been shown to promote confidence, enjoyment of school, and cause more reading at home (Sharman, 1981).

A study by Simpson (1969) that employed creativity tests developed by J. P. Guilford found that music is better at promoting general creative potential than non-musical subjects. He also found that some music courses do this better than others. Choir, music appreciation, and beginning instrument courses promoted one measure of creativity, word fluency, best. Band, piano, and harmony classes best-promoted spontaneous flexibility, another of the creativity measures. All music classes tended to promote the creativity measure of elaboration.

Pirtle and Seaton (1973) studied the effect of musical experiences on neurologically handicapped children. They noted that the neurologically handicapped children developed a functional understanding of musical concepts quicker and better than spatial, temporal, and ordinal concepts. These children demonstrated a keen sensitivity to music.

IMPACT OF MUSIC EDUCATION ON THE SCHOOL

School Climate

Music is perceived as a positive addition to the school curriculum (Sahr, 2000). Indeed, school administrators perceive music as a positive and effective addition for students' total educational experience (Beczkala, 1997). However, financial pressures make it difficult for administrators to support music programs at an appropriate level. Schools infused with the arts have been shown to produce higher student grades and more positive teacher assessments of students (Amaral, 1991; Lathrop & Boyle, 1972).

Effect of Music on Learning

Corenblum and Marshall (1998) tested a model to predict students continuing in high school band. They found that the best predictors were socioeconomic level and teacher predictions of intentions to continue. Another important factor was the support provided the band programs by parents, schools, and the band teachers.

Music competitions have been an on-going concern for the field of music education. Hurley (1996) studied the psychological and social impact of music competition. He found that competitions can have negative effects on student effort and student motivation. Situations that threaten students may cause students to withhold effort. While external evaluation of student

musical performance may cause short-term performance gains, in the long-term such evaluations can reduce student motivation. This is particularly true for black students. Hurley suggests that cooperative environments promote student learning and positive long-term motivation for the vast majority of students and are much more beneficial to student growth.

Schneider and Klotz (2000) studied the effect of participating in music and athletics on standardized test scores. The study found that mean scores were higher for musicians over those of athletes and for students who did not participate in either music or athletics. The authors also found that the gap between musicians and athletes increased with continued participation.

Effect of Music on the Learner

Self-esteem is an important predictive variable in student achievement. Students with more positive self-esteem perform better in school. Vander Ark, Nolin, and Newman (1980) studied the role of gender and self-esteem in predicting attitudes toward music activities. They found that self-esteem was a significant predictor in attitudes toward music activities. Self-esteem was a more powerful predictor than social status, gender, and age. As age increases, attitudes toward music activities decline. Middle social status students have more positive attitudes toward music than those of high or low social status. The least favored of all music activities studied was that of music reading.

Effect of Music on Learning Non-Musical Subjects

Music has been shown to be a positive factor in language learning (Hanshumaker, 1980). Van Asselt (1970) looked at how rhyme, rhythm, song melody, and poems influenced third grade students learning of German. She found that the musical activities were beneficial in the promotion of student learning of German. Omniewski and Habursky (1998) studied the influence of arts infusion on math achievement. They found that arts infusion students had significantly higher math achievement scores than a control group of subjects who received math instruction without the arts. Higher math scores were also obtained by groups of students who received contingent music listening by Madsen and Forsythe (1973). In this study, students could earn time to listen to music as a reward for the number of correct responses to math problems. The study indicates that music can be a powerful motivator for improving math scores.

Music has been used to teach geographical concepts with success (Lehr, 1984). Battle and Ramsey (1990) incorporated social studies facts into the words of a song. The researchers taught this song using both cognitive and psychomotor skills. They found that this strategy was effective in aiding the students' social studies fact recall. Importantly, the students found the song learning experience to be enjoyable and motivating. The song group scored better on a social studies fact test than a control group. Similar positive outcomes have been found for the use of music in aiding social studies learning by Rosenbloom (2004).

IMPACT OF MUSIC EDUCATION ON THE COMMUNITY

Community Needs and Benefits of Music

Burmeister (1955), in a comprehensive effort to learn community attitudes toward music in public schools, surveyed community members as to what is liked or disliked about the way music is taught, what changes should be made to the teaching of music and what is liked or disliked about the music teacher. The study found that the communities surveyed were most concerned that all students have access to music instruction and that students learn to perform music either through singing or playing an instrument. Performance quality, a commonly waived banner in the field of music education, was not important to the public. What was important was

that there be more access to music. The quality of the music teacher was more aligned with quality of personality than it was teacher knowledge, musicianship, and disciplinary ability. The communities wanted better known music to be used, more time spent teaching the appreciation of good music, and performances by performing groups.

Martin (1995) has indicated that musical meaning must be understood as socially constructed rather than as inherent within the music. He points out that music comes from the community. By extension, he is concerned that the notion there is a correspondence between social structures and musical structures is probably not accurate. Walker (1989) is also concerned that music instruction reflects society's understanding and approach to music. He believes that the simplistic reduction of music instruction into sequential skill acquisition is not a fruitful approach.

Music and Youth Culture

Music is important to most adolescents. Generally, the music to which adolescents are attracted is not the music taught in most school music classes. North, Hargreaves, and O'Neill (2000) studied the way adolescents listen to and perform music. They found that listening to music was the most preferred indoor activity, but was not preferred more than outdoor activities and involvement with pop music was perceived to have different benefits to involvement with classical music. The researchers conclude that music is important because it allows adolescents to portray an image to the outside world and it satisfies their emotional needs.

Knowledge of pop music was a source of prestige for low achievers. LaVoie and Collins (1975) found that when students listened to rock music when studying, their academic performance was lower than when listening to classical music or not listening to any music. Norrby (2000) found that when verbally describing familiar music girls tend to use concrete,

specific, and unmitigated descriptions. When describing unfamiliar music, the descriptions are tentative, hypothetical, and imprecise.

Music and Behavior

Music can have a profound effect on behavior. Arnett (1991) found that adolescents who like heavy metal report a wider range of reckless behavior than those who don't. Wyatt (2002) offers a strategy for modifying behavior of male juvenile offenders using musical activities. Through these strategies, improvements in impulse control, social skills, and appropriate self-expression can be obtained.

Brown and O'Leary (1971) investigated the role of pop music within an English secondary school system. They found that exposure to pop music was inversely related to academic achievement. In contrast, Epstein, Pratto, and Skipper (1990) found that musical preference was not related to behavioral problems.

IMPLICATIONS FOR LEARNING

The home environment and its associated factors are the primary determinants of student learning. This is true for music as it is for other subjects. Involving parents in the total music teaching process is important for student success. Research indicates that if appropriate strategies are applied, the actual home environment can be modified to more effectively influence positive achievement outcomes.

Music within schools is perceived as a positive factor for the total education of children. Unfortunately because music creates sound others sometime perceive as noise, music classrooms tend to be off by themselves within the physical plant of schools. This inevitably leads to separation from the school consciousness. Music teachers need to be cognizant of this fact and do all they can to integrate music within the school environment. The literature also suggests that cooperative learning environments are more effective in the long-term. Continuing emphasis by many performance-based music education programs on competitions should be rethought.

Communities are supportive of music in the schools. However, where professional music educators tend to stress the quality of music performance, communities would rather have access for a larger number of students and more performances by the ensembles of the school. Obtuse music written specifically for school groups should be offset by the use of music that is more familiar to the communities that house the schools. It is interesting to note that research shows that it is not pop music that the communities want, it is better known music. Popular music does seem to have a place in motivating adolescents for musical learning. However, it should not be the totality of the instruction. Communities want their students to be taught "good" music and to learn its appreciation.

IMPLICATIONS FOR FUTURE RESEARCH

At the outset of this literature review it was noted that there is very little research on the impact of music education in the home, school, and community. This is research that is sorely needed. The music education research community has been focused on addressing issues associated with the actual teaching and learning of music. It has not been focused on the outcomes of music education. Certainly solid evidence of how music instruction in schools influences the home, the school, and the community would do much to validate having music in the schools. More importantly, it would give insights as to how music education could better serve its broader constituencies.

IMPLICATIONS FOR POLICY MAKERS

The research is clear. Music has a powerful impact on student learning, it enhances the totality of the school experience, and produces positive student outcomes throughout the

academic enterprise. This occurs even when students are taken out of their other subject matter courses to participate in music. Policy makers should note that greater academic achievement in reading, mathematics, and the sciences could be enhanced by viable music offerings within schools.

The other item that stands out in this review is the extremely important role of the home in determining student achievement and that the home environment can be modified to better support student achievement. The home and its associated factors are the single most important determinant of student success. This role cannot be disregarded. Recently, policy makers have been placing great emphasis on the organization of school and the role of teachers in the learning equation. This emphasis looks at an area that is only about 20% of the reasons for student success. The home environment and its relationship with the school and teachers must be considered in educational policy to more effectively reform the Nation's schools as it accounts for 80% of reasons for student achievement in schools.

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7.

A RESEARCH AGENDA TO INVESTIGATE THE IMPACT OF MUSIC EDUCATION

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The primary purpose of the Sounds of Learning project is to determine the impact of music education. As steps toward doing so, the previous five chapters have provided literature reviews and analyses of the impact of music education on academic achievement, child growth and development, aspects of the child's self, the uses and functions of music in daily life, and the home, school, and community environments. Because these chapters focused on what we do know, the purpose of this chapter is to focus on what we do not know and thereby to create a research agenda based on the gaps in our knowledge of the impact of music education. The chapter begins with some general comments on music education research, an overview of what we know and don't know based on the literature reviews, and concludes with a research agenda and requests for proposals.

GENERAL COMMENTS ON MUSIC EDUCATION RESEARCH

Prior to reviewing the five preceding chapters, it might be instructive to consider some general observations on music education research. On the positive side, music education research has been published in the primary journal, the *Journal of Research of Music Education* (JRME), for more than 50 years with the first issue printed in 1953. During this time the music education research community has increased significantly in numbers and in sophistication. The number of research studies presented at convention poster sessions is burgeoning and articles in JRME and

other pertinent journals reflect marked growth in quality of research. Increased sophistication in research design, statistical analysis, qualitative techniques, and interpretation is providing the profession with a valuable knowledge base.

It is only fair to recognize, however, that there are some limitations in this knowledge base. Consider, for a moment, studies reviewed in Chapter 6. A perusal of Table 1, a quantified view of the research from this chapter, is quite instructive. First, one notices that the total number of studies having to do with music or the arts is quite small. Our knowledge base concerning the impact of music on home, school, and community is very limited. Second, the age of some of the research data gives one pause. Although it is perfectly true that older studies may be very insightful, it is also quite true that society and the schools have changed dramatically over the years. For example, in 1955 Burmeister queried community members as to their attitudes toward music education. It would be extremely valuable to know whether those attitudes still hold today. A third observation is that five of the studies were conducted in foreign countries. Information from Brazil, Britain, and Sweden might apply to American concerns, but without comparative data, one can only speculate. The general discussion on home environment also includes data from Canada, Kenya, and Puerto Rico.

Not shown in Table 1 are additional issues of concern. Due perhaps mostly to restricted access to students in schools, restrictions which grow increasingly tighter, few studies randomly assign subjects to treatment groups. That is, most use intact or convenience samples. This makes control of independent variables, factors that might bias the outcome of an experiment, considerably more difficult.

Representativeness of sample to population and sample size are important. Again referring to Burmeister (1955), since he only sampled communities in Missouri, can we assume the findings

apply to all areas of the country? Likewise, Norrby (2002) had a sample size of four. Although case studies can often provide invaluable information that might be lost in larger samples, is this representative of much larger populations? In addition, these two particular examples represent compounded difficulties in that one sampled communities in Missouri in 1955 and the other surveyed four high school girls in Sweden. Representativeness of sample to population can also be seen in other ways. Brand (1986), for example, administered his home survey to Mexican-American second grade students. What can his findings tell us about African-American seventh graders today?

Table 1

Research Studies	Quantified:	Home, School,	Community
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HOME		SCHOOL			COMMUNITY					
Yrs	Home Env. &	Mus & Child Dev	School Climate	Effect of Mus on	Effect of Mus on	Effect of Mus. on L. Non-Mus. Sub.	Com. Needs & Ben of Mus.	Mus & Youth Culture	Mus & Beh	Totals
	Learn	Dev	Climate	Learning	Learner	Sub.	ivius.	Culture	Dell	Totals
50s							1			1
60s		2								2
70s		1	1*			2		1	1+	6
80s	3	1+1*			1	2	1+			9
90s	1		1*+1+	2		1*+1	1		2	10
00-			1	1		1		2+	1	6
Tot	4	5	4	3	1	7	3	3	4	34

* = General arts education, not specifically music.

+ = Data from non-American schools.

Absolutely none of this discussion should be taken as criticism of the researchers mentioned because many of these are excellent studies. Rather, this is recognition that all research studies have limitations of location, sample size, timeliness, and so on. And, in fact, to avoid the perception of a negative view of music education research, the opening, positive comments need to be reiterated. There is much to celebrate about music education research. The sole purpose of this discussion is to recognize the need to expand and upgrade the knowledge base. Policy makers need to make good, careful decisions based on solid, rigorous evidence. The purpose of SoL is to move that enterprise forward by funding targeted research projects.

SYNTHESIS OF CHAPTERS 2-6

Although each of the previous five chapters will be reviewed here, no attempt will be made to move systematically through all the possible topics that deserve or need more research. Simply put, we need more research on nearly every topic; in fact, it is difficult to think of any topic on which we do not need more research. Therefore, the following discussion will be selective (and undoubtedly somewhat arbitrary) in nature, attempting to highlight certain topics that seem especially critical.

2. The Impact of Music Education on Academic Achievement (Hodges & O'Connell)

Although there is a fair amount of literature on the impact of music education on academic achievement, it is not overwhelmingly positive. Rather, there are quite a few studies showing that music students have higher academic scores than their peers, another group of studies with mixed results (e.g., improvement in reading but not in math), and a third group that show no improvement for music students. The majority of these are descriptive studies where test scores are compared for music students and others. Another group of studies are concerned with the relationship between music aptitude and academic achievement. The prevailing trend is a stable, but low degree of relationship. Only a small group of studies are experimental and most of these do not involve random assignment of subjects to treatment groups.

A small number of studies have concerned the relationship of auditory perception to reading. It seems reasonable to hypothesize that music education improves auditory perception, which in turn might impact reading skills. This does, indeed, seem to be the case. Pitch discrimination appears to be the most critical factgorneral, however, studies of the effect of music instruction on reading or math achievement have led to mixed results.

The same can be said for integrated arts instruction. Even where positive results have been found, it is impossible to determine music's contribution relative to the other arts that were included. In three studies that integrated music without other arts into the teaching of other subject matter, no significant effects were found.

Background music is so prevalent in contemporary American society that one might expect it to be paired with academic work—doing homework, taking tests, and so on. Perhaps precisely because music is so omnipresent in society, there is a natural assumption that it will have a positive effect. Yet, the data are, as with nearly every topic in this chapter, quite mixed. Simplistically, we could even say that during test taking, for example, music in the background will have a positive effect on some students, a negative effect on others, and no effect on a third group. This is hardly the kind of information that is useful to teachers, administrators, and policy makers. But, it reflects the current state of our knowledge.

One avenue music education researchers could explore is the effect of personal listening devices such as iPods. One can imagine a technologically-advanced class environment in which students could choose to listen to music or not while taking a test. And, those who choose to listen to music could choose the particular kind of music they prefer. This same principle has been used successfully in music medicine. That is, music can be very effective in ameliorating pain and anxiety when patients are allowed to choose whether or not to have music and are further allowed to select personal preferences (Reilly, 1999; Pratt & Spintge, 1996; Spintge & Droh, 1992).

3. The Impact of Music Education on All Aspects of A Child's Growth and Development (Teachout)

Cognitive Development

Evidence indicates that music processing occurs to a limited extent in the third-trimester fetus, in a significant way in newborns, and increasingly so in infants. Research on infants makes a case for the integration of nature and nurture in that certain musical skills are evident from birth while others are clearly influenced by learning. Somewhat overlooked and underrepresented in the literature is the socializing role of music in the infant's home and other environments such as day care. As critically important as music may be in cognitive development, it may be even more important in emotional and social development. While lullabies help to calm fussy babies, do they also aid in mother-infant bonding? Does music coming from parents and the media, such as Mr. Rogers, Sesame Street, and the like, aid in the development of positive feelings, in the development of emotional control mechanisms, or in establishing appropriate social interactions? Contrarily, is there any evidence to suggest that adult musical styles played in the home (especially at high loudness levels) has any deleterious effect on infant growth and development?

Neuroimaging data from adult musicians documents quantifiable changes in brain morphology that are even more pronounced among those who started studying music seriously before the age of seven. Although genetic influences are not ruled out, it is becoming increasingly clear that music study changes the brain. It is important to note that these changes come more from active music making, not passive listening. What implications these changes have for nonmusical processing remains to be determined. Some answers may come from a major initiative now underway to gauge the effects of music instruction on brain changes in beginning instrumentalists ages six to eight and to determine whether there are transfer effects to other learning domains (Schlaug, Norton, Overy, Cronin, Lee, & Winner, 2004).

Motor Development

Music education activities have a positive effect on motor development in very young, preschool, and school-aged children. Though the available evidence demonstrates a developmental trend, the amount of research is still quite limited in that there are few studies and these frequently have small sample sizes. Most of the knowledge base concerns motor development in early childhood and pre-school children. Very little is known about the impact of music education on motor development on elementary through high school students.

Emotional Development

Most of the research literature in this area has focused on emotional responses to music listening. In general, it appears that music education experiences do not necessarily lead to differences in emotional responses when the music is relatively unsophisticated. This resonates with what one can observe in the popular culture. People with widely divergent music education backgrounds respond appropriately to the music they hear in movies, on television, and in restaurants, shops, and other common settings. Music education experiences do appear to benefit those who listen to more complex musical styles. If it is true that those who engage in more sophisticated artistic experiences require more educational experiences to derive maximum understanding, music education researchers and music education philosophers should work together to make a stronger case for how engaging with more sophisticated musical experiences without the benefit of a musical education, why should he spend time and energy learning more complicated musical languages?

Social Development

Once again, there is limited evidence concerning the impact of music education on social development. The scant data available suggest a positive role for music in social development. As with motor development, this body of literature is almost entirely restricted to pre-school children. Given the enormous role music plays in social interactions of children and youth throughout elementary, middle, and high school years, it is amazing that this topic has been so neglected. Music education researchers, especially those working with psychologists and/or sociologists, have a vast territory waiting to be explored. The potential findings could have very significant implications for the importance of music education in the lives of school students.

Impact on At-Risk Students

At-risk students pose a serious concern for those involved in education. From the general—extra-curricular activities and arts programs—to the specific—music education classes—there are tantalizing suggestions that music can play a positive role in keeping at-risk students in school. Although the literature on this topic is limited, it uniformly suggests that music can play an important role in dealing with at-risk students. It is, yet again, another way in which music might provide an effective means of dealing with a critical issue.

Impact on Special Needs Students

Music therapists have been the primary contributors to an understanding of the impact of music on special needs students. Of necessity, the sample sizes are almost always quite small. Also, more attention has been paid to younger students. Nevertheless, it is clear that music can play a very important role in helping special needs students achieve success. It would be very helpful to have information throughout the educational continuum from pre-K through high school.

4. The Impact of Music Education on Aspects of the Child's Self (O'Connell)

Although there is not a great deal of research on aspects of the child's self, it is almost all supportive of the notion that music has a positive impact. Music education experiences generally lead to better attendance rates and increased motivation, self-discipline, and cooperation. The literature on self-esteem was mixed; there is a hint that music may be helpful for those with low self-esteem but may have little impact on those with normal self-esteem. Likewise, attitudes toward music are mixed with very positive attitudes among primary school children and negative attitudes among secondary students. Perhaps the latter is due to the mismatch between "school music" and popular/rock music.

No research was found for the impact of music on self-image. This omission is one that ought to be rectified by the profession. Anecdotally, one can observe the effect of music on selfimage and it would be very informative to have solid research studies in this area. Another area in need of careful research is the impact of music education on student health. Hearing health, vocal health, neuromusculoskeletal health, and mental health have been studied in professional musicians and are beginning to be studied in university music majors. It should be stating the obvious to say that many health issues begin much earlier than the college years. If music educators are interested in preventing health problems before they occur, then solid research on these issues is imperative.

5. The Uses and Functions of Music as a Curricular Foundation for Music Education (Haack)

Haack's chapter is different from the other three in at least two major respects: (1) it follows a model provided by Merriam (1964) and (2) it has direct curricular implications. Each of these leads to suggestions for a research agenda.

While it is tempting to suggest that each of the ten functions should be buttressed by ongoing research, two are brought forward here as critical to understanding the impact of music education—the functions of emotional expression and the integration of society. A common notion about music education is that students learn to express themselves emotionally through music. But what do we really know about this process? Is it necessarily true that students in school music groups are expressing more positive emotions than those playing in a hard rock band? Do we know how to teach "emotional expression"? When students participate in ensembles what is the relationship between group and individual emotional experiences? Do students sacrifice individual emotional experiences to the group experience, or is there even a difference? Obviously, this list of questions could become quite lengthy and demonstrates the critical need to understand this aspect of music education in considerably more depth and sophistication.

That music can play an important role in the integration of society seems quite obvious on the surface. But, examining this notion more closely leads to a number of intriguing questions. How important is it that all American citizens share a common body of songs? How does one find the balance between teaching songs that represent the heritage of our country such as "Battle Hymn of the Republic" or "Oh what a beautiful morning" versus those that represent the cultural heritage of specific minority groups? Indeed, there is a larger tug-of-war between "the preservation of the canon" and inclusion of multicultural music education. In the ideal, most would argue that both are necessary. But, the reality is that music educators have precious little time with their students and hard choices have to be made.

Beyond choice of song repertoire, another aspect of this function is cultural cohesion versus cultural pluralism. Is it true that students from a wide variety of ethnic and social backgrounds

can bond and become united through performing in school music groups? Many music teachers can provide anecdotal stories about how students have been brought together through music. For example, in one school Latino, African-American, and Anglo students have become united while singing in a school-sponsored gospel choir and correspondingly racial tension has been reduced throughout the school (Street, personal communication). Could the impact reach beyond the school to the entire community?

One can easily reverse this function and think about the ways in which music contributes to isolation and fragmentation in society. In most schools, students could be divided into cliques based, in part, on their musical choices. What characteristics do those who listen primarily to country-western music share that are different from those whose music of choice is rap? Is social identity through musical style preference harmful in the sense of polarizing one group from another or can it be helpful too in the sense of individuals finding camaraderie within a group of like-minded peers? Common sense suggests that both are possible, but data supporting music's role in the integration of society are woefully lacking. Probably few doubt that the impact of music education on social integration is powerful, but we must know more.

6. The Impact of Music Education on Home, School, and Community (Asmus)

The influence of the home is important to so many issues in music education but it is woefully under-represented in the literature. It would be very interesting to have Brand's (1986) HOMES survey updated and extended. The original survey focused on four dimensions of home musical environment: (1) parents' attitude toward music and musical involvement with child; (2) parents' concert attendance; (3) parent and child ownership and use of record player or tape player, and (4) parent plays a musical instrument. Administering such a revised survey to a very large number of households distributed over a large geographical area would provide invaluable information about relationships between home environment and music education.

Those who spend time in a public school—especially teachers, administrators, and students—could likely comment on the impact of music programs on the overall school climate. This is seen in obvious ways such as music at pep rallies and athletic contests but also in the school reputation as reflected in contest ratings and parental comments following school performances. Unfortunately, there is very little research literature on this topic.

Issues concerning students and their involvement with popular music are in dire need of serious and extensive study. Most people would likely agree, on the basis of casual observation alone, that students are involved in the popular culture in significant ways. However, unless and until this involvement is studied in depth, "school music" experiences may be increasingly marginalized in students' lives. Notice this last statement—that school music experiences might be increasingly marginalized—is one of pure conjecture; there are precious few data to support or refute such a contention. Highly related would be an extensive investigation into relationships between different musical genres and behavior. Is there any truth to a perception that students in school bands, orchestras, and choirs exhibit fewer inappropriate or anti-social behaviors than those who prefer hard rock, rap, or other styles of youth music?

RESEARCH AGENDA

With these reviews in mind, it is tempting, again, to call for more research on every topic. In this regard, it might be worth reiterating a statistic reported in the section in Chapter 2 on reading: more than 115,000 research studies on reading have been published in the literature (National Institute of Child Health and Human Development, 2000). By comparison, all the literature cited in this entire document seems paltry indeed. Since calling for more research on

every topic, even though that is justified, would not be helpful, some prioritization seems in order. Therefore, what follows is a broad research agenda that will be used to guide the subsequent requests for proposals. Following the Research Agenda are the Requests for Proposals that will be funded in Phase 2.

I. The Impact of Music Education on Achievement

- A. What is the impact of music education on other subjects in the curriculum?
 - 1. Examine relationships between participation in music education programs and grades in nonmusic classes.
 - 2. Examine the effects of continued participation in music education on grades in nonmusic classes. In other words, are there changes in the relationships over time, such that continuing to participate in music results in stronger or weaker relationships?
 - 3. Conduct experimental research to determine the impact of music education on learning in other domains. Wherever possible, subjects should be randomly assigned to treatment groups.
 - 4. Investigate the impact of music teacher traits (e.g., personality, enthusiasm, rapport with students, etc.) on academic achievement.
- B. What is the effect of integrating the teaching of music into language arts, mathematics, geography, science, foreign language, history, or other subjects? Do various aspects of music (e.g., rhythm or pitch) have differing effects?
 - 1. Investigate integrated music instruction and learning in nonmusic subjects, pre-K through 12th-grade.
 - 2. Investigate specific aspects of music instruction on nonmusic subjects, including rhythmic and melodic perception, performance, instruction, and learning.
- C. What are the effects of music education on standardized tests?
- D. How do melodic-rhythmic instruction, perception, and performance contribute to spatial temporal reasoning/memory?
- II. The Impact of Music Education on All Aspects of a Child's Growth and Development

A. What is the impact of music education on the development of perception and cognition?

- 1. Investigate the chronological points at which music learning begins to support and perhaps enhance neural development.
- 2. Determine whether there are critical, optimal, or sensitive periods for music learning and if, so when they occur and under what circumstances.
- 3. Continue to construct more rigorous research paradigms to determine the effects of music instruction on nonmusical subjects.
- 4. Compare music learning to other stimuli to determine whether there are musicdependent effects on the learning of nonmusical material.
- 5. Utilize neuroimaging technologies to determine what changes take place in the brain as a result of music learning. Also, determine whether any observed changes have implications for learning in other domains besides music.
- B. What is the impact of music education on motor development?
 - 1. Investigate more thoroughly the connections between music education and motor development along a chronological continuum from infancy through high school.
 - 2. Determine whether certain music education activities are more conducive to the development of gross motor skills and others to fine motor skills.
- C. What is the impact of music education on emotional development?
 - 1. Music psychologists have made significant strides on understanding emotional responses to music. Music education researchers should be encouraged to collaborate with psychologists for more sophisticated studies of emotion and music
 - 2. Investigate whether those who study music develop more sensitive emotional responses. Determine whether they are able to plumb emotional experiences to greater depths than those without music education experiences.
 - 3. Investigate whether music students are able to express emotions more effectively than those who do not study music. When they express emotions musically, are they expressing their own or the composers' or the directors'?
- D. What is the impact of music education on social development?
 - 1. Determine the role of music education experiences on the social behaviors of music students. Are music students more cooperative, more stable in their relationships with others, more apt to get along with others?
 - 2. Investigate the ways in which music education might influence interpersonal relationships based on gender, ethnicity, socio-economic status, and so on.

- E. Impact on At-Risk Students
 - 1. Determine whether music education experiences can influence at-risk students to stay in school and reduce the number of their absences.
 - 2. Determine whether music education can assist at-risk students to develop a greater sense of self-esteem.
- F. What is the impact of music education on special needs students?
 - 1. Investigate the ways in which music education experiences can affect acceptance attitudes of students toward special needs students.
 - 2. Determine best practices for teaching special needs students within the regular music classroom or rehearsal.
- III. What is the impact of music education upon the child's self?
 - 1. Investigate the impact of music education on attendance, motivation, selfdiscipline, self-esteem, cooperation, perseverance, and attitude.
 - 2. Initiate a research program into the impact of music education experiences on the child's health. Based on solid data obtained with school-aged children, initiate a prevention program.
- IV. Uses and Functions of Music as a Curricular Foundation for Music Education
 - A. What is the impact of music education on the function of emotional expression?
 - 1. Investigate the impact of music education on students' abilities to express themselves emotionally.
 - 2. Investigate whether emotional expression shows a developmental trend with continuous, prolonged involvement in music education.
 - 3. Investigate whether music education promotes "self expression" or whether teachers and/or composers determine emotional expressions.
 - 4. Investigate the effects of engaging in different musical genres (e.g., classical, jazz, country-western, gospel, rock, rap, etc.) on emotional expression.
 - 5. Examine whether music education enables participants to have keener insights into emotional experience.
 - B. What is the impact of music education on cultural cohesion and on cultural pluralism?

- 1. Investigate the impact of a common body of songs on social integration.
- 2. Investigate the impact of various musical genres on social integration.
- 3. Investigate whether music education can positively impact issues in social integration in the schools such as racism and inclusion (gender, special needs students, etc.).
- C. Can Merriam's ten functions serve as the basis for a music education curriculum?
 - 1. Create and evaluate a ten-lesson unit based upon Merriam's functions for middle school general music classes.
 - 2. Create and evaluate suitable lesson plans for ensembles based on Merriam's ten functions.
- V. The Impact of Music Education on Home, School, and Community
 - A. What is the role of the home in music education?
 - 1. Revise and extend Brand's (1986) HOMES survey, administering it to a large sample over a broadly distributed geographic region with ethnic and socioeconomic representation.
 - 2. Investigate the basis for the strong, positive relationships between participation in music education and higher grades or SAT scores that are commonly reported. Since correlation does not imply causation, is this rather a reflection of strong parental support, instruction in time management, or other variables?
 - B. What different outcomes, if any, might be derived from participation in school music education experiences versus participation in non-school musical experiences
 - 1. Investigate and compare the "meanings" derived from participation in school and non-school musical experiences.
 - 2. Examine a common (mis?)conception that "classical" music training leads to more positive attitudes and behaviors, while participation in certain genres of music (e.g., heavy metal, hard rock, gangsta rap, etc.) does the opposite.
 - 3. Investigate whether it is true, as an aesthetic philosophy of music would suggest, that music education provides "insights into the human condition" or, as Howard Gardner's (1983) theory of multiple intelligences suggests, that music is another way of knowing.

SOUNDS OF LEARNING: THE IMPACT OF MUSIC EDUCATION

Phase 2: Request for Proposals

Proposal submission deadline: November 1, 2005

Sounds of Learning: The Impact of Music Education is a major research initiative designed to examine the roles of music education in the lives of school age children. The goal of this project is to expand the understanding of music's role in a quality education. The International Foundation for Music Research is sponsoring a series of research studies, with additional funding provided by the Fund for Improvement of Education from the U.S. Department of Education and the Grammy Foundation. Phase 1 research projects were awarded to Patricia Campbell, University of Washington and Christopher Johnson, University of Kansas.

A Steering Committee oversees the establishment of various research agenda and proposal review processes. Grants and research contracts will be awarded competitively following peer-review processes. Steering committee members include:

Don Hodges, The University of North Carolina at Greensboro Ed Asmus, The University of Miami Paul Haack, The University of Minnesota Kristin Madsen, Senior Vice President, The Grammy Foundation Patricia Sink, The University of North Carolina at Greensboro David Teachout, The University of North Carolina at Greensboro Mary Luehrsen, Executive Director, International Foundation for Music Research Debra O'Connell, The University of North Carolina at Greensboro

Project Scope

This initiative will examine music education's influence on:

- (a) Achievement and success in school,
- (b) All aspects of a child's growth and development,
- (c) The uses and functions of music in daily life,
- (d) The home, school, and community environments, and
- (e) Aspects of the individual self.

Reviews of related literature on each of these topics are contained in the *Sounds of Learning Status Report*, with research details in an online database. An outgrowth of these reviews is a Research Agenda that leads to the RFPs in this announcement. The *SOL Status Report* and database can be found at: http://www.uncg.edu/mus/soundsoflearning.html or on the IFMR website at www.music-research.org.

RFP 2.1: The Role of Music Education in Social Cohesion and Social Pluralism

Proposals are invited to investigate the role music education plays in social cohesion and social pluralism in the schools. In the former, the investigator should examine how music education functions to promote social integration within disparate constituencies in the school. For example, to what degree are students with different socioeconomic backgrounds, abilities/disabilities, ethnicities, and cultural heritages successfully integrated into cohesive units

via music education experiences? Similarly, what roles do music experiences (including schoolbased and non-school performing groups) have in promoting cultural pluralism and does this result in both positive (e.g., enhancement of group identity) and negative (e.g., fragmentation, isolation, competition, etc.) outcomes? Overall, is the social integration of a given school (and perhaps its surrounding community) aided or impeded by music education and by non-schoolbased musical experiences? Is music unique in providing these outcomes? The successful proposal should include (a) how different school-based and non-school-based musical experiences will be identified, (b) how different constituencies (e.g., socioeconomic status) will be identified, (c) how the effects of music activities on social cohesion and pluralism will be determined, and (d) how the researchers will determine spread of effects to the school as a whole and perhaps to the surrounding community.

RFP 2.2: The Impact of Music Education on Adequate Yearly Progress as Defined by the *No Child Left Behind Act*

During January 2002, the No Child Left Behind Act (NCLB) was signed into law. The law required states to implement standard-based assessments in reading and mathematics for students in grades three through eight by the 2005-2006 academic year. Because of the NCLB accountability standards and requirements, improving students' reading and mathematics achievements has become a major focus of educators, researchers, and policy makers. The purpose of this project is to conduct a quantitative research study of the impact of participating in music instruction on third- through eighth-grade students' achievements in reading and mathematics. Additionally, a part of the study should be designed to determine the extent to which student participation in music instruction contributes to school achievement. Variables other than music instruction that may affect reading and mathematics achievement and that should be controlled in the study are grade level, gender, ethnicity, school location (e.g., rural, urban, or suburban), music aptitude and achievement, and parents'/guardians' education and socioeconomic level. The successful proposal should include a description of: (a) how schools and students will be selected for the research study, (b) the process of obtaining the aforementioned data to accomplish the objectives of this project, and (c) methods of data analysis.

RFP 2.3: THE IMPACT OF A QUALITY MUSIC PROGRAM ON K-12 EDUCATION

The purpose of this project is to perform qualitative research within a school district recognized for its musical quality. We are interested in obtaining a proposal that can identify the primary student achievement and success outcomes resulting from participation in music education programs. The study would look at the breadth of possibilities of how music impacts children in elementary and secondary schooling as exemplified in one school district with a quality music program. The study should provide a sorted list of the major outcomes that can be used to focus future research. The supporting qualitative evidence for each outcome's rating must be provided. The successful proposal should indicate how a school district with a quality music program will be identified, as well as student achievement and student success outcomes.

RFP 2.4: Awareness of the Functions of Music in Music Education.

Alan Merriam identified ten functions of music that could be used as the basis for a contemporary, motivational curriculum for music education that would impact daily living. Proposals are solicited that would examine the degree to which such functions are considered as

a part of instruction within the field. Additionally, we seek research that explores the feasibility of applying these functions in both music classrooms and music rehearsals. The successful proposal will reflect a broad diversity in the sample selected for study and should identify (a) how the role of functions will be determined and (b) how information on application of functions in classrooms and rehearsals will be gathered.

RFP 2.5: The Role of the Home Environment on Success in School Music and Student Success in School

Researchers are invited to submit a proposal for an investigation into the role of the home environment on success in music and school. Do students who are successful in music share common features in their homelives? What roles do parents and siblings play in this regard? What features of the home environment (e.g., presence of a piano or other instruments) contribute most toward success in school music and student success in school? Interrelationships among the home, school music, and student success in school are of critical concern. The successful proposal will reflect a broad diversity in the sample selected for study, including a variety of socioeconomic levels and cultural and ethnic heritages.

RFP 2.6: The Effects of Music Education on Self-Esteem/Self-Identity/Self-Image

Proposals are sought that would examine the effects of music on self-esteem/self-identity/selfimage. What kinds of music experiences are most conducive to the development of a positive self-esteem? What role does music play in the construction of identity? Does participation in non-school musical experiences (e.g., garage bands, gospel choirs, rap or hip-hop groups, heavy metal bands, etc.) lead to a different sense of self-image? The successful proposal will also include special needs and at-risk populations.

RFP 2.7. The Meanings of Music for Students in School-based and Non-school Musical Activities

Proposals are requested for an investigation into the meanings of musical experiences. In particular, we are interested in knowing whether students who participate in school-based music education ensembles (e.g., middle school band, high school chorus, etc.) derive different meanings from their experiences than those who participate in non-school musical experiences (e.g., garage bands, gospel choirs, rap or hip-hop groups, heavy metal bands, etc.). Data such as attendance records, office referrals for misconduct, suspensions, grades, and so on, should be used to determine whether any relationships exist among levels of participation, meanings derived, and behaviors exhibited. The successful applicant will present a well-designed strategy to collect both qualitative and quantitative data and to integrate the two. The successful proposal will focus on the basic question of what is the value of having music in schools?

How to Apply

All proposals are due on November 1, 2005.

Award notification: December 5, 2005.

Final, completed reports for most projects are due December 1, 2006. Applicants who feel a

longer timeline is justified may request a later deadline for a longitudinal project.

Proposals should be submitted via email to info@music-research.org.

Funding and Awards

Projects will be funded through direct research contract and/or via grants to sponsoring institutions. The IFMR will not fund in-kind or institutional overhead costs that are more than 8 percent of project budgets. Funding range or caps are not specified; budgets will be assessed based on relevancy to project scope of work and appropriateness to project goals and outcomes.

Applicants are encouraged to target proposals to the most appropriate RFP. Research teams involving music education researchers and others from disciplines such as education, sociology, or psychology are encouraged. Funding is awarded on a competitive basis; researchers should apply for only one RFP.

Proposal requirements:

- 1. State research topic for proposed study, taken from one of the seven RFPs addressed above. Describe relevancy of study to current understanding. Summarize, do not include comprehensive literature review in proposal.
- 2. Describe target population and setting(s) for research; outline current partnerships or affiliations that will enable execution of research.
- 3. Outline research design and methodology to research proposed area; include description of tests or measures that will be implemented or other study protocols.
- 4. Describe expertise/experience to implement proposed study; if applicable, provide web links to published research papers and articles.
- 5. Proposal body not to exceed 10 double spaced pages for # 1-4; budget, timeline and CV additional.
- 6. Provide project timeline and detail implementation tasks; use a one page timeline grid if desired.
- 7. Provide detailed budget. Budget must include expenses (airfare, hotel) to allow the principal investigator to attend the mandatory Research Awards Conference on February 18-19, 2006 in Greensboro, NC.
- 8. Attach CV. Work samples and references may be requested.

A panel of experienced music education researchers will evaluate all proposals. Direct all inquiry to sounds@uncg.edu; applications should be sent via email only to: International Foundation for Music Research at <u>info@music-research.org</u>.

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APPENDIX A BRIEF BIOGRAPHIES OF STEERING COMMITTEE MEMBERS

EDWARD P. ASMUS, Associate Dean for Graduate Studies and Professor (Music Education) at the University of Miami, earned a B.M.E. degree from Ohio State University, and M.M.E. and Ph.D. degrees from the University of Kansas. He is a member of the editorial committees of the *Journal of Research in Music Education*, the *Bulletin of the Council for Research in Music Education*, and *Psychomusicology*. His research has centered on affective response to music, music motivation, nonmusical outcomes of music instruction, quantitative methodology, and arts assessment. This research has resulted in numerous publications, including books, tests, measures, computer programs, and articles in major research publications of music education. He is the current editor of the *Journal of Music Teacher Education* and is cited as one of the ten most productive researchers in music education.

PAUL A. HAACK received his Ph.D. from the University of Wisconsin in 1966 after teaching instrumental and choral music as well as general music and related arts classes in the public and parochial schools of the Madison area. He joined the faculty of the University of Minnesota in 1988, after 22 years of teaching and graduate school administration at the University of Kansas. His teaching fields include instrumental, general music and related arts methods, and the psychology, sociology, and aesthetics of music. His research interests relate to these areas and emphasize musical values, attitudes, perceptions, and preferences. Haack has served on a variety of national commissions, committees, and editorial boards. He is coauthor of *Principles and Processes of Music Education* and has published several textbook chapters and over 150 articles in professional journals. He also has written a series of solos in varying jazz styles for high school instrumentalists. He currently serves as head of the Division of Music Education/Music Therapy, as Minnesota Music Education Research Chair, and as a member of the National Arts Standards Task Force.

DONALD A. HODGES is Covington Distinguished Professor of Music Education and Director of the Music Research Institute at the University of North Carolina at Greensboro. His degrees are from the University of Kansas (BME) and the University of Texas (MM and PhD). Previous appointments include the Philadelphia public schools, the University of South Carolina, Southern Methodist University, and the University of Texas at San Antonio. Hodges is contributing editor of the *Handbook of Music Psychology* and the accompanying *Multimedia Companion* CD-ROMs and has published numerous book chapters, articles, and research papers in music education and music psychology. He has made presentations to state, national, and international conferences, and served on editorial boards and in various capacities with professional organizations. Recent research has focused on a series of brain imaging studies of musicians.

MARY LUEHRSEN worked extensively as a professional flutist for 20 years as an orchestral and chamber music performer in the New York metropolitan area. She is a certified music educator and taught elementary general music and band, and secondary instrumental music. She was also department chairperson for the Harrison Central School District in Harrison, New York. Following several years as Executive Director of the Westchester Philharmonic, Mary started her own consulting firm and worked with corporate and nonprofit clients in the areas of strategic planning, fund raising, and trustee development. For two years, Mary was the national Program Officer for the Texaco Foundation and led the company's Early Notes early childhood music education effort. Mary joined NAMM – International Music Products Association in 2001 as director of public affairs and government relations and was named Executive Director of the International Foundation for Music Research, a NAMM nonprofit affiliate. In addition to external affairs and strategic partnerships, Mary spearheaded the re-deployment of the National Music Education advocacy efforts.

KRISTEN MADSEN is a 15-year veteran of the music and arts industries and is currently serving as Senior Vice President of the GRAMMY Foundation and MusiCares, two charities founded by the Recording Academy. Prior to heading up the GRAMMY charities, Madsen served as Vice President of Member Services for the Recording Academy for 8 years. During her tenure there, she oversaw significant growth in the department. A few key accomplishments include a doubling of the membership; an expansion of chapter offices from 8 to 12; an increase and refocusing of the Academy Grants program from \$45,000 to \$700,000; and the launch and development of GRAMMY Fest, a month-long celebration of the GRAMMYs bringing together the Academy's GRAMMY activities with local cultural programs. Madsen began her career in the arts management field working at the Utah Arts Council where she acted as consultant to non-profit organizations on issues including board development, grant writing, marketing and program development. In that position she also managed a roster of touring artists including booking dates, contract negotiations and publicity. She also ran the California Assembly of Local Arts Agencies, a membership association dedicated to ensuring access to public funds for arts programming in local communities across the state.

DEBRA S. O'CONNELL is a Postdoctoral Fellow with Sounds of Learning: The Impact of Music Education project. Dr. O'Connell received her Ph.D. in Music Education at the University of North Carolina at Greensboro. Since receiving her doctorate, she has worked as a Program Specialist with SERVE Regional Educational Laboratory. Dr. O'Connell has experience as a public school band and orchestra director. She has published educational research and investigated the musical abilities of newborn infants.

PATRICIA E. SINK is Associate Professor and Graduate Advisor for Music Education at the University of North Carolina at Greensboro. She earned BM and MM degrees in Music Education from UNCG and the PhD degree from the University of Kansas. She also is a Registered Music Therapist. Dr. Sink taught choral and general music in North Carolina and Iowa Public Schools and served as a Music Therapist in the Menninger Foundation Children's Hospital in Topeka, Kansas. While in Iowa, she was the Chair of the Music Education Division at Drake University. She is active in the MENC: National Association for Music Education and the North Carolina Music Educators Association, having held offices in both organizations. She has published research in the *Journal of Research in Music Education, Bulletin of Historical Research in Music Education*, and the *Southeastern Journal of Music Education*. She also published a chapter in the *Handbook of Research in Music Education* pertaining to middle school general music teaching and learning. Currently she is serving on the editorial board of the MENC affiliated journal *UPDATE: Applications of Research in Music Education*. Sink's teaching responsibilities in the School of Music primarily involve teaching graduate music education courses, advising dissertation research, and teaching an upper level undergraduate course focused on special music education.

DAVID J. TEACHOUT is Associate Professor and Chair of the Music Education Division at the University of North Carolina at Greensboro. His degrees are from West Virginia University (BME), the University of Oklahoma (MME), and Kent State University (PhD). Prior to joining the faculty at UNCG, he taught undergraduate and graduate courses at the University of Minnesota and at Pennsylvania State University; he also enjoyed ten years of successful public school instrumental music teaching experience in Moore, Oklahoma. Dr. Teachout's research interest is in pre-service music teacher development. His work has been presented at state, regional, national, and international conferences and published in Journal of Research in Music Education, Psychology of Music, Journal of Band Research, Contributions in Music Education, Southeastern Journal of Music Education, Curriculum Innovation in Music, and On the Sociology of Music Education. Dr. Teachout serves on the editorial review board for Research Issues in Music Education and on the national advisory board for Desert Skies Symposium on Research in Music Education. He is a past National Chair of the Collegiate Division of Music Educators National Conference and is currently the National Chair of the Society for Music Teacher Education.