

Rowan University

Rowan Digital Works

Theses and Dissertations

5-9-1996

An investigation of the association between the musical aptitude of elementary students and the musical aptitude of their biological parents

Susan Guerrini

Rowan College of New Jersey

Follow this and additional works at: <https://rdw.rowan.edu/etd>



Part of the [Elementary Education and Teaching Commons](#)

Recommended Citation

Guerrini, Susan, "An investigation of the association between the musical aptitude of elementary students and the musical aptitude of their biological parents" (1996). *Theses and Dissertations*. 2165.

<https://rdw.rowan.edu/etd/2165>

This Thesis is brought to you for free and open access by Rowan Digital Works. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of Rowan Digital Works. For more information, please contact graduateresearch@rowan.edu.

**AN INVESTIGATION OF THE ASSOCIATION BETWEEN THE
MUSICAL APTITUDE OF ELEMENTARY STUDENTS
AND THE MUSICAL APTITUDE OF THEIR
BIOLOGICAL PARENTS**

by
Susan Guerrini

A THESIS

Submitted in partial fulfillment of the requirements for
the Master of Arts in Subject Matter Teaching: Music
Graduate Division of Rowan College
1996

Approved by

Date Approved 5/9/96

ABSTRACT

Susan Guerrini

An Investigation of the Association between the
Musical Aptitude of Elementary Students
and the Musical Aptitude of their
Biological Parents

1996

Thesis Advisor: Dr. Lili Levinowitz

Master of Arts: Subject Matter, Teaching Music

Graduate Division of Rowan College of New Jersey

The purpose of this study was to determine if there is a hereditary link between the musical aptitude of elementary students and the musical aptitude of their biological parents.

The problem of the study was to determine if three age specific tests, created by the same author, could be equalized to measure the association of the musical aptitude of students and their biological parents.

Eighty-eight students from Grades 1 through 5 and eighty-one volunteer parents took part in the study, totaling 169 participants. The students from these families attended the same suburban, middle class elementary school, where they received fifty minutes of general music instruction per week from the same certified music specialist. Within a two week period, all students in grades one through five were administered the age appropriate music aptitude test designed by Edwin E. Gordon. Students were scored on Tonal, Rhythm and Composite musical aptitude. In the next two week period, volunteer parents were also administered the age appropriate music aptitude test, which

was also designed by Edwin E. Gordon. Parents were likewise scored on Tonal, Rhythm, and Composite musical aptitude.

Subsequently, scores for the students and parents were divided into categories of high, medium and low musical aptitude for Tonal, Rhythm and Composite scores. Each parent/child dyad were then assigned to their respective place within three separate 3x3 cross breaks designs for each of the subtests of Tonal, Rhythm and Composite, respectively. The data were analyzed using a chi-square statistic.

The researcher failed to find a statistically significant association between the musical aptitude of children and their biological parents when comparing their scores on three music aptitude tests.

MINI-ABSTRACT

Susan Guerrini

**An Investigation of the Association between the
Musical Aptitude of Elementary Students
and the Musical Aptitude of their
Biological Parents**

1996

Thesis Advisor: Dr. Lili Levinowitz

Master of Arts: Subject Matter, Teaching Music

Graduate Division of Rowan College of New Jersey

The problem of the study was to determine if three age specific tests, created by the same author, could be equalized to measure the association of the musical aptitude of students and their biological parents.

The researcher failed to find a statistically significant association between the musical aptitude of children and their biological parents when comparing their scores on three musical aptitude tests.

ACKNOWLEDGMENTS

The author wishes to express sincere appreciation to Dr. Lili Levinowitz for sharing her intellectual and mentoring gifts so willingly. Through her encouragement and unconditional belief in the researcher, she advised, revised and always inspired this writer to greater achievements.

The author also wishes to thank her husband, Frank, who believed in her even before she did. His love and support were the cornerstones upon which this thesis was constructed.

Thanks also goes to the author's three sons, Dominic, Jimmy and Ben, who consumed endless amounts of pizza on class nights. They were willing to share a portion of their time and their computer with their mother just because this project was important to her.

TABLE OF CONTENTS

ACKNOWLEDGMENTS.....	iv
LIST OF TABLES.....	v
LIST OF FIGURES.....	vi
CHAPTER ONE	Introduction and Purpose of the Study.....1
	Introduction.....1
	Purpose and Problem.....5
CHAPTER TWO	Related Research.....6
	The Stanton Study.....7
	The Shuter-Dyson Study.....13
CHAPTER THREE	Design of the Study.....18
	Sample.....18
	Procedure.....19
	Design and Analysis.....24
CHAPTER FOUR	Results and Interpretations.....25
	Analysis of Tonal Aptitude.....26
	Analysis of Rhythm Aptitude.....28
	Analysis of Composite Aptitude.....30
	Interpretations.....32
CHAPTER FIVE	Summary and Conclusions.....35
	Purpose and Problem of the Study.....35
	Design and Analysis.....35
	Results of the Study.....36
	Conclusions and Recommendations.....37

APPENDIX A.....	40
APPENDIX B.....	42
APPENDIX C.....	43
APPENDIX D.....	44
APPENDIX E.....	45
APPENDIX F.....	46
APPENDIX G.....	47
BIBLIOGRAPHY.....	48

LIST OF TABLES

Table 2.1	Correlations on the Wing Test.....	15
Table 3.1	Criterion Percentiles for Designation to Categories of Tonal Aptitude	24
Table 3.2	Criterion Percentiles for Designation to Categories of Rhythm Aptitude.....	25
Table 3.3	Criterion Percentiles for Designation to Categories of Composite Aptitude.....	25
Table 4.1	Frequencies and Chi-Square Statistic for the Tonal Aptitude Subtest.....	26
Table 4.2	Frequencies and Chi-Square Statistic for the Rhythm Aptitude Subtest.....	28
Table 4.3	Frequencies and Chi-Square Statistic for the Composite Subtests.....	30

LIST OF FIGURES

Figure 1	Tonal Aptitude.....	27
Figure 2	Rhythm Aptitude.....	29
Figure 3	Composite Aptitude.....	31

CHAPTER ONE

INTRODUCTION

Babies are musical beings. They coo, they babble, they even tend to cry around one central pitch. But at their birth, infants have many developmental struggles to overcome. Among the first things they must accomplish is the ability to acquire control over their bodies, and the capacity to communicate with their new world. And yet, these newborn babies are born with the ability to hear and respond to pitch and rhythms.

Sheila C. Woodward¹ states that hearing has developed in the growing fetus by the 25th week and that within the uterus the fetus is able to hear a vast array of sounds, including music. The unborn child already possesses complex auditory abilities in discriminating the frequency, timbre, intensity and duration of sound.² Therefore, each child who is born and is classified as normal and hearing, possesses the potential to develop musically. But not all children develop musically within the same timetable, nor do they all

¹ Sheila C. Woodward, "The Window of Opportunity," *International Society for Music Education Early Childhood Commission Seminar: Vital Connections: Young Children, Adults & Music*, (Columbia, Missouri: University of Missouri, July, 1994).

² P.E. Wilkin, *Prenatal Perception, Learning and Bonding* (Berlin: Leonardo Publishers, 1993): 307-329.

become discriminating or functioning musicians despite the fact that every child is born with the same tools.

Levinowitz and Guilmartin³ state that between the ages of 24 and 48 months some children will be able to sing apart from a music stimulus, have control and use of a vocal mechanism and coordinate the upper body to the beat of a song for one or two phrases. But many preschool music teachers offer anecdotal evidence that as many as half or more of the children in their classes, who are of the ages three to five, have difficulty matching the pitch and keeping a steady beat of any given song. Many of these children can be classified as being in the music babble state, which John Holahan divides into three stages.⁴

By the time a child reaches elementary school the gulf widens between those children who exhibit a degree of musical ability by matching pitch and keeping a beat, and those students who even at the ages of seven and eight are still exhibiting difficulty in matching the resting tone of a simple song. Why is there such a disparity in ability? Is it possible that some children are genetically predisposed to be more musical than others?

To attempt to answer these intriguing questions, it is first necessary to make a distinction between the musical aptitude of a person, and the musical achievement of that same person. Edwin E. Gordon indicates that music

³ Lili M. Levinowitz and Kenneth K. Guilmartin, "Understanding and Enhancing the Young Child's Music Development," *Music and Movement Center*, (Princeton: 1993).

⁴ John M. Holahan, "Toward a Theory of Music Syntax: Some Observations of Music Babble in Young Children." *Music in Child Development*. Edited by J. Craig Peery, Irene Weiss Peery and Thomas W. Draper (New York: Springer Verlag, 1987): 96-106.

aptitude is the potential that a person has to be a musician; utilizing audiation, tonal recognition, and rhythmic recognition skills.⁵

Music achievement, on the other hand, is the manner in which some people with music aptitude are able to fulfill their musical aptitude, often by either singing or playing an instrument. But Gordon is careful to point out that there are many so called musicians (that is, those who play instruments or sing) who do not have a high degree of musical aptitude, as well as many people who do not consider themselves musicians who, when tested, exhibit a high degree of musical aptitude.⁶

Gordon notes that as early as 1911, scholars such as Stumpf, Pear, Pevesz, Rupp, and Mjoen and Mjoen, were attempting to establish that music aptitude was an inborn or innate characteristic.⁷ But this belief was based on research that appears to be flawed. Gordon indicates that these early studies examined only the families of professional musicians and musical prodigies. These scholars, therefore, were confusing music achievement with musical aptitude.⁸

In 1922, Hazel Stanton⁹ developed a study in which she worked with eighty-five members of six families who had at least one professional musician among them. She administered the *Seashore Measures of Musical*

⁵ Edwin E. Gordon, *The Nature, Description, Measurement, and Evaluation of Music Aptitudes*, (Chicago: G.I.A. Publications, Inc., 1987).

⁶ *Ibid.*, 6

⁷ *Ibid.*, 5

⁸ *Ibid.*, 6

⁹ Hazel Martha Stanton, "The Inheritance of Specific Musical Capacities," *Psychological Monographs*, 31 (1922).

*Talent*¹⁰ and found generally higher scores among the participants. Amram Scheinfeld conducted a similar study in 1956 which agreed with the Stanton study.¹¹ But both of these studies also neglected to address the issue of true musical aptitude and instead are based on musical achievement.

There is a need for solid research to be done with the general population on the subject of musical aptitude and its connection with genetics.

¹⁰ Carl E. Seashore, *Seashore Measures of Musical Talent* (New York: Columbia Phonograph company, 1919). Distributed by the C.H. Stoefting Company of Chicago.

¹¹ Amram Scheinfeld, *The New Heredity and You* (London: Chatto & Windus, 1956).

PURPOSE OF THE STUDY

The purpose of this study is to determine if there is a hereditary link between the musical aptitude of elementary students and the musical aptitude of their biological parents.

The problem of the study is to determine if three age specific tests, created by the same author, can be equalized to measure the association of the musical aptitude of students and their biological parents.

CHAPTER TWO

RELATED RESEARCH

Several researchers have been interested in the subject of musical aptitude as it relates to heredity. Among them have been Galton,¹ Stanton,² Scheinfeld,³ and Shuter-Dyson.⁴ These studies have taken place over a span of time that encompassed 1869 to 1964. Accordingly, the research techniques and the manner in which data were analyzed and interpreted varied widely. Some studies, such as those conducted by Scheinfeld, were compromised by the lack of scholarly research associated with the project. Others, such as Galton, provided scant relevancy due to their age. Therefore, this chapter will be confined to the more recent research reported by Hazel Martha Stanton and Rosamund Shuter-Dyson.

¹ F. Galton, *Hereditary Genius* (London: Macmillan, 1869).

² Hazel Martha Stanton, "The Inheritance of Specific Musical Capacities," *Psychological Monographs*, 31 (1922).

³ Anram Scheinfeld, *The New Heredity and You* (London: Chatto & Windus, 1956).

⁴ Rosamund Shuter-Dyson, "Hereditary and Environmental Factors in Musical Ability," *The Eugenics Review* 58 (September, 1966): 3.

Stanton Study

Hazel Martha Stanton was among the first psychologists to design a study utilizing a music aptitude test that had been published by Carl Seashore⁵ in 1919. That test systematically measured the aptitudes of musicians in the areas of pitch, intensity, time, consonance, tonal memory and rhythm. Stanton administered these tests to musicians and sought to compare those scores obtained from the musicians with their blood relatives who had also been given the same tests.

Stanton's landmark study began in 1920 when she collaborated with Charles B. Davenport, director of the Department of Genetics at Carnegie Institution of Washington. Also joining the investigation was Carl E. Seashore, head of the Department of Psychology and dean of the Graduate College at the University of Iowa. Although it was not directly stated, it appears that Drs. Seashore and Davenport served in the role of advisors to the study, while Dr. Stanton, who was Seashore's first assistant at the University of Iowa, actually implemented the project.

It is interesting to note that none of these three collaborators had music degrees. This lack of formal musical credentials, however, did not deter Drs. Seashore, Stanton and Davenport from designing and implementing a research project based on musical principles.

⁵ Carl E. Seashore, *Seashore Measures of Musical Talent* (New York: Columbia Phonograph Company, 1919). Distributed by the C.H. Stoelting Company of Chicago.

The purpose of Dr. Stanton's study was to "secure information regarding the inheritance of certain musical capacities by quantitative methods."⁶ Dr. Stanton again wrote about this study in 1935, where she stated further that a secondary purpose of the 1920 study was to "determine the significance of the presence of innate talent in families apart from musical achievement and expression."⁷

But despite her previous statement concerning the search for talent regardless of achievement, Stanton chose only American musicians who had acquired either national or international reputations in their musical field. One could safely refer to these musicians as high musical achievers. This does appear to be contrary to her goal of seeking innate talent among those who were not high achieving musicians. Furthermore, Stanton never addressed this apparent contradiction. She also did not reveal the names of the eminent musicians she studied, but gave them code names such as "Alpha", and "Beta", etc. In all, she studied 85 members from six families.

Each of the 85 family members were administered four subtests from the *Seashore Measures of Musical Talent*.⁸ These subtests included pitch, intensity, time and tonal memory. Stanton used phonograph records to

⁶ Hazel Martha Stanton, "The Inheritance of Specific Musical Capacities," *Psychological Monographs* 31 (1922): 157.

⁷ Hazel Martha Stanton, "Measurement of Musical Talent: The Eastman Experiment," *Studies in the Psychology of Music* II (January 15, 1935): 105.

⁸ Carl E. Seashore, *Seashore Measures of Musical Talent* (New York: Columbia Phonograph Company, 1919). Distributed by the C. H. Stoelting Company of Chicago.

administer the tests for intensity, time and tonal memory. However, tuning forks were used in administering the pitch test. Considering that the year was 1920, it could be said that Dr. Stanton was using the best technological equipment available to her at that time through the use of phonographic records. It should also be noted, however, that Stanton used tuning forks when testing pitch acuity. By following the directions in the Seashore manual to use these "old-fashioned" tuning forks, Stanton was opening up the possibility of creating some problems with standardization of volume which in turn could effect test scores. It appears that Seashore did not take this possible problem into consideration when he designed his subtest.

In addition to the musical aptitude scores, the persons participating provided anecdotal evidence of the presence or absence of musical capacities in 531 relatives who could not be tested either because they lived too far away or because they were deceased.

But Stanton was also interested in the musical environment of her subjects. She created a questionnaire that addressed such issues as the frequency that musical artists were heard in the home, as well as wanting to know if her subjects attended concerts and operas on a regular basis in their youth as well as their adult life. She also wanted to know about their musical education and training. She was curious about whether the subjects performed music in public or private, and whether music played a role in their daily lives. She was seeking information to discover if any of her subjects were involved in teaching, practicing or just listening to music as part of their daily routine.

It does not appear that Stanton attached a quantitative judgment to the quality of the musicianship reported. It appears that she was content to record the fact that music was being played and/or composed by these relatives, regardless of the level of excellence.

In her questionnaire, Stanton also asked one question relating to the affective area of music. She wanted to know what her subjects' emotional reaction to music was, and she rated them highly if they reported "repeated experiences of emotional states, aroused by musical stimulation, expressed in the form of exhaustion, sobbing exhilaration, transferred into another world, conscious outgo of emotional power."⁹ People who answered yes to this question were granted 5 points, the highest amount given. This investigator found it interesting that data that appeared to be of such a subjective and emotional nature would be included in a study of this importance.

Stanton addressed some of the problems that were inherent in a study that was dependent on biographical data. She stated

It is well known that biographical records depend entirely on qualitative data and records of musical achievement; therefore they do not reveal dormant talent. Therein lies their essential inadequacy as a source of data concerning musical talent in families for the determination of principles of heredity. Therefore, one is dependent, to a great extent, upon the possibilities of measuring some fundamental capacities in order to tap the natural potentialities apart from musical accomplishment.¹⁰

⁹ Hazel Martha Stanton, "Measurement of Musical Talent: The Eastman Experiment," *Studies in the Psychology of Music* II (January 15, 1935): 107.

¹⁰ *Ibid.*, 107.

Stanton also appeared to realize the limitations that were imposed on her study by selecting only musically talented families. She stated "There is a need for scientific data from non-musical families to verify our theoretical deductions for such groups."¹¹

But despite these qualifications, Stanton was willing to form a conclusion, based on her administration of the four *Seashore Measures of Music* and the biographical survey that she developed. She concluded that "the inheritance of musical capacities seems, indeed, to follow Mendelian principles".¹²

Stanton also reached what she called tentative conclusions that she described in the following manner:

Musical parents of musical stock tend to have musical children
Non-musical parents of non-musical stock tend to have non-musical children
Parents, one of whom is musical from musical stock and the other non-musical from non-musical stock, tend to have children of both types.¹³

This investigator applauds Dr. Stanton for having the vision to attempt to measure the musical capacities of famous musicians and their related family members. It is significant that only one year after the *Seashore Measures of Musical Talent* were published, Stanton had discovered a way to use them to measure musical talent within families.

However, it must be noted that even though she was using the latest techniques available to her at the time, the conclusions she made were not supported by the data she discovered, particularly when considering the limited scope of the sample. A study which involves tests is only as good as

¹¹ Ibid., 110.

¹² Ibid., 110.

¹³ Ibid., 111.

the test themselves. The weaknesses of the subjective biographical survey have already been discussed earlier in this chapter. But problems have also been found with the *Seashore Measures of Musical Talent* on which Stanton based her study.

Edwin E. Gordon,¹⁴ in his book, *The Nature, Description, Measurement, and Evaluation of Music Aptitudes*, hailed Carl Seashore as "a great pioneer, the first researcher to give sustained scholarly attention to the nature and description of music aptitude." However, Gordon questioned not only Seashore's entire concept of what constitutes musical aptitude, but also the reliability and validity of the tests themselves.¹⁵

Rosamund Shuter-Dyson,¹⁶ in her book, *The Psychology of Musical Ability* agreed in part with Gordon's assessment of Seashore's tests. As Gordon did, Shuter-Dyson also questioned the reliability of the tests as a whole, and indicated that "most of the correlations ...fall well below .50."¹⁷

Therefore, this investigator found flaws in the Stanton study which tended to lessen the impact of her conclusions. These flaws included the following:

¹⁴ Edwin E. Gordon, *The Nature, Description, Measurement, and Evaluation of Music Aptitudes* (Chicago: G.I.A. Publications, Inc., 1986) 22.

¹⁵ Ibid., 22-27.

¹⁶ Rosamund Shuter-Dyson and Clive Gabriel, *The Psychology of Musical Ability*, (London and New York: Cambridge University Press, 1981).

¹⁷ Ibid., 18.

1. The emphasis on musical achievement instead of musical aptitude.
2. The limited scope of the sample. (85 family members).
3. The reliance on anecdotal evidence for 531 additional family members.
4. The use of a tuning fork in the *Seashore Tests* to test pitch acuity.
5. The use of a survey, in addition to the *Seashore Tests*, and many of the questions on the survey.
6. The validity of the *Seashore Tests*.

Shuter-Dyson Study

Forty four years after the Stanton study, the question of hereditary factors in musical ability was once again investigated, this time by Rosamund Shuter-Dyson, who was a researcher working on her doctoral thesis from the University of London. Shuter-Dyson conducted her investigation in 1964, using the knowledge that she had acquired from scrutinizing the reports of Stanton and others. But Shuter-Dyson's study contained two key elements that were lacking in her predecessors. First, this study was designed in a more scientific manner that utilized the more modern and acceptable standardized research methods of the 1960's. Second, and significantly, Shuter-Dyson's investigation sought information from the general population, instead of looking at a specified group of talented musicians. Accordingly, this study may be considered a landmark in itself, since it was the first study to examine musical potential or aptitude rather than musical achievement.

The aim of the investigation was to "study how far musical ability depends on heredity or environment by comparing parents with children, and

monozygotic with fraternal twins."¹⁸ She included fifty-four boys and girls from a mixed grammar school and thirteen girls from a grammar school for girls in the Home counties of England. Also included in the test were seventy-eight parents of these children.

Each person was tested using the *Wing Standardized Tests of Musical Intelligence*¹⁹ battery of musical aptitude tests. Similar to the Stanton study, Shuter-Dyson also collected data through the use of a questionnaire. She sought information about whether her subjects played instruments, took music lessons, went to concerts and listened to music at home.

Although Shuter-Dyson was seeking a heterogeneous grouping of students and parents, when tabulating the scores from the *Wing* tests, she found that the parents typically scored higher than the general public. She theorized that this was because

a volunteer group tends to become a self-selected one, since adults are more likely to attend if they themselves are musical, or have some interest in music, or feel that their children may show talent.²⁰

The results that Shuter-Dyson found did not appear to show a strong correlation between a parent's aptitude and their children. These results are reproduced as Table 2.1.

¹⁸ Rosamund Shuter-Dyson, "Hereditary and Environmental Factors in Musical Ability," *The Eugenics Review*, 58 (September 1966): 3.

¹⁹ H.D. Wing, *Manual for Standardised Test of Musical Intelligence*, (Sheffield, England: City of Sheffield Training College, 1948).

²⁰ Rosamund Shuter-Dyson, "Hereditary and Environmental Factors in Musical Ability," *The Eugenics Review*, 58 (September 1966): 3, 151.

Table 2.1²¹
Correlations on the Wing Test

	Number	Correlation Coefficient
Midparent-child	25	0.475
Each parent-each child	100	0.290
Father-child	25	0.627
Mother-child	25	0.258
Higher scoring parent-child	25	0.394
Father-mother	25	0.331
Siblings	14	0.496

The only correlation that appears to be practically significant is that between the father and the child. All other coefficients do not appear to show practical significance. Shuter-Dyson believed that she did not have a representative sample, due to the self-selection process, and indicated that with a more heterogeneous group, she may have obtained higher correlations overall.

But, like the Stanton study, there appears to be a fundamental flaw in the selection of the musical aptitude test upon which the investigation was based. *The Wing Standardized Tests of Musical Intelligence*, published in London in 1948, contains seven subtests. Included among these subtests were tests of appreciation, whereby a listener was required to indicate whether an excerpt of music was better or worse the second time it was played. These excerpts were taken from master composer's works and then altered either rhythmically, harmonically or melodically. The listeners were required to

²¹ Ibid., 152.

indicate their preference. They were then judged to be incorrect if they had chosen the altered example. This was a major departure from the *Seashore* tests, which did not include any preference tests.

Another difference from the *Seashore* tests was the emphasis of the *Wing* tests on the whole or composite results. Seashore placed equal importance on the separate tests of tonal and rhythm, while Wing believed that pitch and rhythm were not to be considered as separate components. Therefore, Seashore could be considered a proponent of the "atomistic" theory of musical aptitude, while Wing would be labeled a "Gestalt" theorist.

Shuter-Dyson chose her countryman's test when there were few other tests to consider. She stated that "Independent studies have confirmed the validity of the test"²² but she did not address their reliability. Edwin E. Gordon, however, found that the reliability of the Wing test was questionable.²³ Gordon also found problems in the design of the *Chord Analysis* subtest as well as the *Memory* subtest, which, he believed, inflated the reliability reported by the author of the *Wing* tests. Gordon also believed that the *Wing* test appeared to be more of an achievement test than an aptitude test and related more to general intelligence and academic achievement than music aptitude.²⁴ This may account for the results, already discussed, of the higher correlation between the father and child. These results may be spurious, due to the fact that achievement is based on information acquired which may be

²² Rosamund Shuter-Dyson and Clive Gabriel, *The Psychology of Musical Ability*, (London and New York: Cambridge University Press, 1981), 24.

²³ Edwin E. Gordon, *The Nature, Description, Measurement, and Evaluation of Music Aptitudes*, (Chicago: G.I.A. Publications, Inc., 1986), 32.

²⁴ *Ibid.*, 33-34.

passed from parent to child. This would then be seen as an environmental influence, and not a result of heredity.

If one were to accept the judgments of Edwin E. Gordon regarding the *Wing* test, then it would be possible to go a step further and use this information to evaluate the Shuter-Dyson study. It is conceivable that one would discover that even though Shuter-Dyson carefully planned to base her study within the general population so that she could objectively measure musical aptitude, she actually administered an achievement test. Her study might be considered flawed since it was based on an aptitude test with questionable reliability that may in fact measure the musical achievement that Shuter-Dyson was seeking to avoid. It appears that a study, regardless of the impeccable quality of its design, is only as good as the test on which it is based.

CHAPTER THREE

Design of the Study

Sample

The sample students attended a suburban elementary school, located in Burlington County, New Jersey. The school population is approximately 525 students, with grades extending from Kindergarten through fifth grade. Class size is approximately 22 students per class.

Most students are from a middle class, white collar environment. Due to the on-going downsizing in many corporations, there are some families who have experienced recent drops in their earning capacities. However, most children live in single family dwellings, which are owned by their parents. It is common to have at least two cars in every family. The racial makeup of the school community is mostly Caucasian, with some Black, Hispanic, Indian and Asian children attending the school. All students speak English fluently. Each child in grades one through five receives fifty minutes of music instruction per week from a certified music specialist.

Procedure

Before a possible link between the musical aptitude of parents and their natural born children could be investigated, a way to measure the musical aptitude of both parent and child was needed. This was provided by using Edwin E. Gordon's Musical Aptitude tests.

The *Primary Measures of Music Audiation (PMMA)* was administered to the students of Evans school who were in grades one through three. Students in grades four and five took the *Intermediate Measures of Music Audiation (IMMA)* which was also created by Edwin Gordon. The children took these tests during the last two weeks of February, 1995. The music teacher administered the tonal portions of the tests during the student's regularly assigned music period. She administered the rhythm portion during the following week, also during the regularly assigned music period. There were a few children who were absent during the two weeks of school testing. Those test were made up during the following two weeks.

The *Advanced Measures of Music Audiation (AMMA)* was selected to be administered to any parents who might volunteer to take part in the study. This test was chosen for several reasons. The test can be administered in a relatively short amount of time (usually 20 minutes), which might appeal to any prospective volunteers. In that short amount of time, both tonal and rhythmic aptitude can be determined. The reliabilities for the test were also convincingly high. To ensure for continuity within the study, it was also beneficial that all the tests being administered to all subjects, both adult and children, would be created by the same author, Edwin Gordon.

It was decided that the optimum time to administer the test to parents would be during the weeks of March 13 through March 25, 1995. A letter was composed by the researcher (Appendix A), and directed to the parents of the students in grades one through five who attended Evans school. The letter contained information about the study in general, stated how the test would be conducted, estimated the length of time needed to take the test, and requested that parents who were interested in participating in the study fill out an enclosed form (Appendix B). The letter was sent home with all students on February 22, 1995. Three hundred and forty-five families received this information.

Within one week, the researcher received 103 positive responses. During this time, the researcher also contacted the editor of the P.T.A. newsletter in the hope that the parent association would agree to publish a short article concerning the forthcoming study. This article subsequently appeared in the March, 1995 edition of the P.T.A. newsletter (Appendix C). It is unknown whether the article generated any additional responses from the parents.

The researcher also discussed the study with her students in grades one through five during the week of February 20, 1995. A short speech was given at the beginning of each class, describing the study and requesting the children deliver the letter that would be sent home with them. As part of an ongoing reward system, the researcher promised two jolly ranchers to any students who were able to convince their parents to volunteer to take the test.

This generated interest among the children that appeared to be far greater than the reward offered. Beside serving the purpose of a slight motivator, the jolly rancher reward became very beneficial in helping students remember,

over the two week period, that the testing of parents was taking place. Since jolly ranchers were awarded at the beginning of subsequent classes, it provided time and opportunity for commentary from both the researcher and the students. The reward was intended to help keep the research topic alive in class and did serve to pique the interest of the students.

During the week of March 1 through 6, 1995, the investigator sent home letters to the respondents (Appendix D), assigning them a time to take the aptitude test, based on the information that they provided on the response form. Great care was taken to reassure parents that the assigned time could be changed. The researcher was very aware of the volunteer nature of this project and took many measures to accommodate any time requests that parents had.

Ten test sessions were set up for the parents who volunteered to take the test. The groups taking the test may varied in size from one to twenty. Each time the test was administered in the music room, with tables and chairs especially set up to create an environment conducive to taking an auditory test. The *AMMA* test was played through a stereo tape system, with four speakers, which produced a clear, audible sound.

The adult testing took place during the weeks of March 13 through 31, 1995. As the parents came into the music room they were requested to fill out a survey (Appendix E).

Although the survey contained questions that were valuable to the study, the real purpose of the survey was to give the parents something to do, while they were waiting for all the parent volunteers to arrive. The survey was also useful to the researcher for record keeping and as a starting point for

conversation with parents who were often strangers to the researcher. The actual information from the survey was not analyzed for the results of this study.

After the survey was completed, the researcher gave the parent a blue index card with their child's name, the combined raw score that the child had received on the *PMMA* or *IMMA* test, and an interpretation of that score such as "Very high", "High Average", or "Average" (Appendix F). Combined raw scores were converted into percentile ranks according to the charts provided on page 61 through 65 of the *PMMA/IMMA* manual. Parents did not receive these percentages; however they were given an interpretation of the percentages in the following manner:

Percentages of 80 - 99	Very High
50 - 79	High Average
20 - 49	Average

The researcher waited about ten minutes for all parents to attend the session, then closed the door and began the test. The room was quite soundproof and the researcher noted that each session continued without incident or stoppage.

After the first session, it became quite clear to the researcher that a high level of frustration was present among the test takers. Many expressed feelings of inadequacy and spoke of not wishing to see the results of their test since they believed that the results would be low.

Wishing to bolster the musical self confidence of the volunteer parents, the researcher quickly marked the tests and sent the results home the following day. There was an ulterior motive for providing the results so quickly. The

researcher was concerned that there might be negative talk in the community about the test if the volunteer parents were not shown quickly that they had scored much better on the test than they realized. This could have a negative effect on the rest of the volunteer parents who were scheduled to come later during the two weeks of testing.

The note that was sent home to parents indicating their scores was similar in nature to the one that listed the children's scores (Appendix G). However, no raw scores were listed in the parents' report. Instead, parents were told what category they scored in. The same categories were given. They were the following:

Percentages of	80 - 99	Very High
	50 - 79	High Average
	20 - 49	Average

One parent requested "bottom line numbers" and was provided with the percentages that corresponded to his raw score. Fortunately, they were quite high.

The number of students who took part in the study totaled 88. Grade levels included were from Grades 1 through Grade 5. Eighty-one parents took part in the study. The total amount of children and parents tested was 169 people. The researcher did not include the results of two families because the parents were not biologically related to their children. Two other parents had difficulty with the English language and their tests were not included in the reported results. The results of one other family were omitted because the parent took the test while inebriated.

DESIGN AND ANALYSIS

The data from all administrations was sorted by family. Only the data from those families with blood relationships was analyzed; data from step families, adoptive families, etc. was discarded.

To interpret the association among students' musical aptitudes and their parents' musical aptitudes, each of the parents' and children data were divided into low, medium and high categories as can be seen in tables 3.1, 3.2, and 3.3.

It should be noted that the criterion percentiles for all the students' music aptitudes and composite are higher than those recommended in the manual for the designation of high, medium and low aptitude.¹¹

Criterion Percentiles for Designation to Categories of Tonal Aptitude

Table 3.1

	High	Medium	Low
Grade 1	96% - 99%	44% - 95%	0% - 43%
Grade 2	99%	36% - 98%	0% - 35%
Grade 3	90% - 99%	46% - 89%	0% - 45%
Grade 4	75% - 99%	24% - 74%	0% - 23%
Grade 5	65% - 99%	11% - 64%	0% - 10%
Parents	66% - 99%	35% - 65%	0% - 34%

¹¹ Edwin E. Gordon, *Primary Measures of Music Audiation and the Intermediate Measures of Music Audiation* (Chicago: G.I.A. Publications, Inc., 1986): 68.

Criterion Percentiles for Designation to Categories of Rhythm Aptitude

Table 3.2

	High	Medium	Low
Grade 1	98% - 99%	45% - 97%	0% - 44%
Grade 2	91% - 99%	57% - 90%	0% - 56%
Grade 3	87% - 99%	64% - 86%	0% - 63%
Grade 4	80% - 99%	31% - 79%	0% - 30%
Grade 5	90% - 99%	21% - 89%	0% - 20%
Parents	70% - 99%	41% - 69%	0% - 40%

**Criterion Percentiles for Designation to Categories of
Composite Aptitude - Table 3.3**

	High	Medium	Low
Grade 1	97% - 99%	51% - 96%	0% - 50%
Grade 2	95% - 99%	51% - 94%	0% - 50%
Grade 3	86% - 99%	55% - 85%	0% - 54%
Grade 4	75% - 99%	21% - 74%	0% - 20%
Grade 5	80% - 99%	21% - 79%	0% - 19%
Parents	70% - 99%	36% - 69%	0% - 35%

Each parent /child dyad were then assigned to their respective place within three separate 3x3 cross breaks designs for each of the subtests of Tonal, Rhythm and Composite, respectively. A chi-square analysis with .05 level of confidence was computed for all three cross breaks designs.

CHAPTER FOUR

Results and Interpretations

Analysis of the *PMMA*, *IMMA* and *AMMA* scores for students in grades one through five and their biological parents

Analysis of Tonal Aptitude

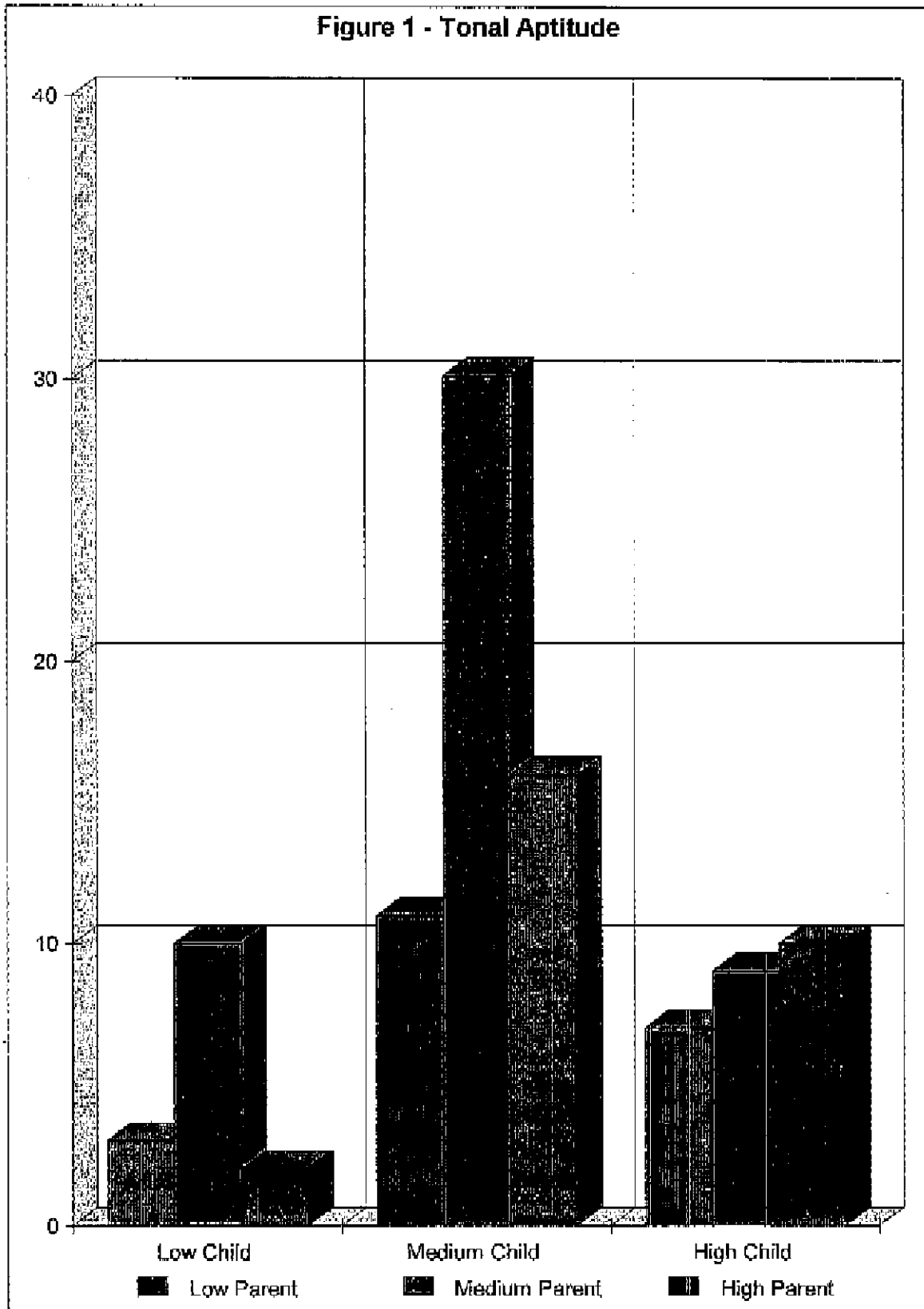
The observed frequencies and chi-square statistic for the 3 x 3 contingency table are presented in Table 4.1. The researcher failed to find a statistically significant chi-square. The frequencies located in the diagonal from low parent/low child to high parent/high child are 3, 30, and 10, respectively. Furthermore, a three dimensional representation of the nine cells within the contingency table is included in Figure 1.

Tonal Aptitude - Table 4.1

	Low Parent	Medium Parent	High Parent
Low Child	3	10	2
Medium Child	11	30	16
High Child	7	9	10

$\chi^2 = 4.197$ n.s.
(4)

Figure 1 - Tonal Aptitude

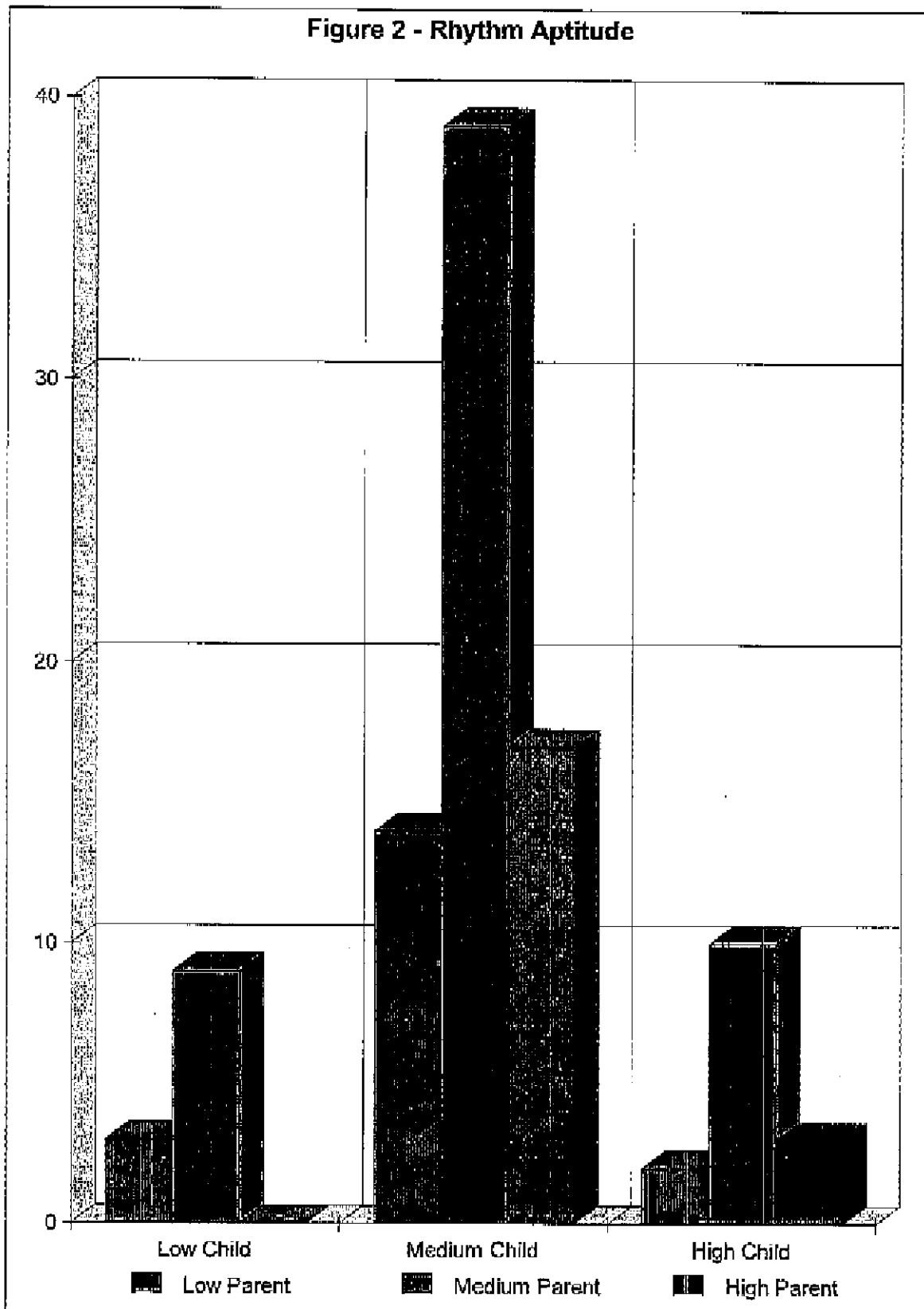


Analysis of Rhythm Aptitude

The observed frequencies and chi-square statistic for the 3 x 3 contingency table are presented in Table 4.2. Again, the researcher failed to find a statistically significant chi-square. The frequencies located in the diagonal from low parent/low child to high parent/high child are 3, 39 and 3, respectively. Furthermore, a three dimensional representation of the nine cells within the contingency table is included in Figure 2.

Rhythm Aptitude - Table 4.2

	Low Parent	Medium Parent	High Parent
Low Child	3	9	0
Medium Child	14	39	17
High Child	2	10	3
$\chi^2 = 4.197$ n.s. (4)			

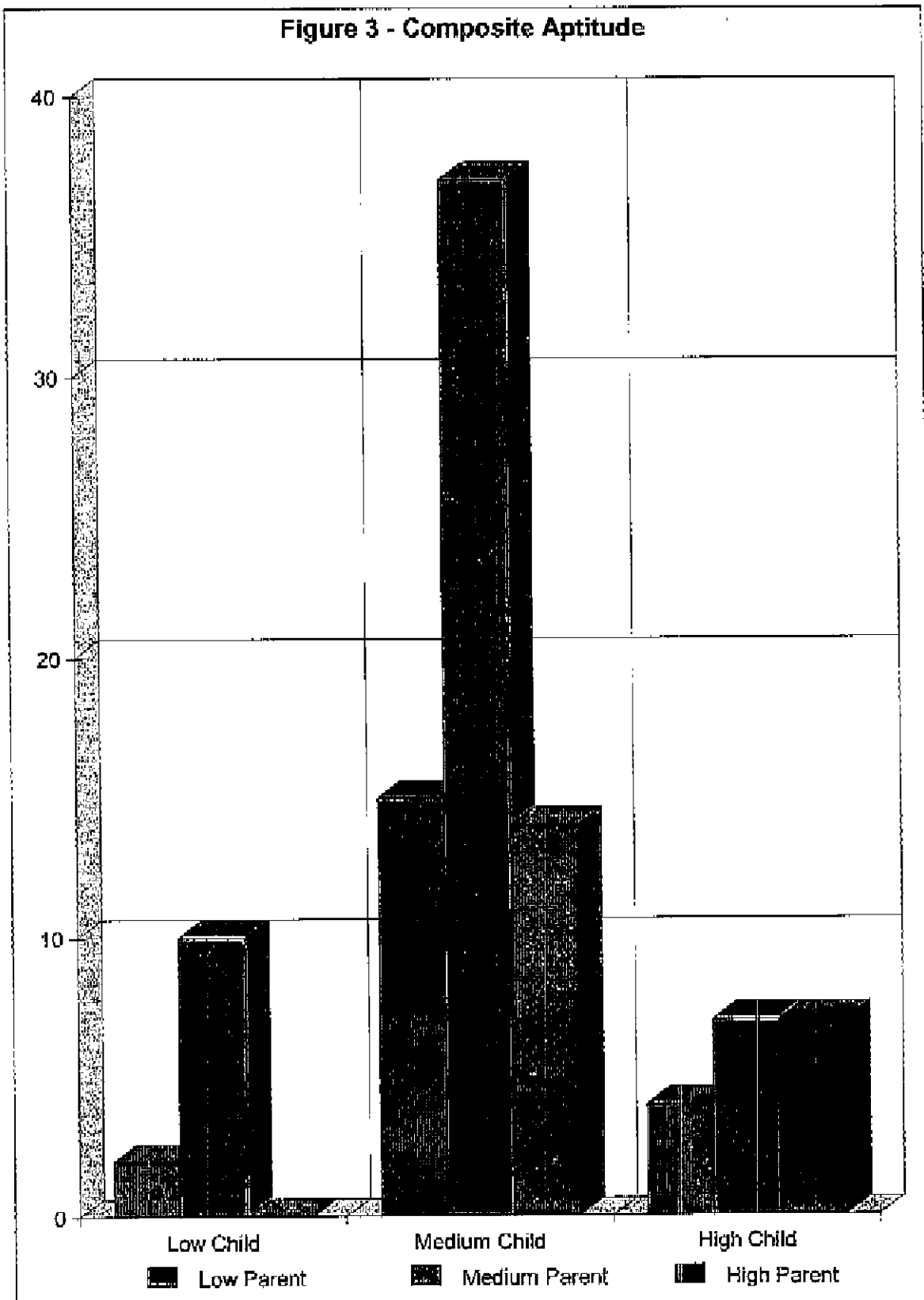
Figure 2 - Rhythm Aptitude

Analysis of Composite Aptitude

The observed frequencies and chi-square statistic for the 3 x 3 contingency table are presented in Table 4.3. The researcher failed to find a statistically significant chi-square. The frequencies located in the diagonal from low parent/low child to high parent/high child are 2, 37, and 7, respectively. Furthermore, a three dimensional representation of the nine cells within the contingency table is included in Figure 3.

Composite Aptitude - Table 4.3

	Low Parent	Medium Parent	High Parent
Low Child	2	10	0
Medium Child	15	37	14
High Child	4	7	7
$\chi^2=4.197$ n.s. (4)			

Figure 3 - Composite Aptitude

Interpretations

The researcher failed to find a statistically significant association between the musical aptitude of children and their biological parents when comparing their scores on three musical aptitude tests. These three tests, the *Primary Measures of Musical Aptitude (PMMA)*, the *Intermediate Measures of Musical Aptitude (IMMA)* and the *Advanced Measures of Musical Aptitude (AMMA)*, all authored by Edwin E. Gordon, were administered to the subjects of this research in an age appropriate manner.

Upon examination of the chi-square charts (Table 4.1, 4.2, 4.3) if a hereditary association were significant, the researcher would expect the diagonal to express it. One would expect to see more students in the diagonal with fewer numbers outside of the diagonal.

That this researcher found no apparent statistically significant association may have occurred for several reasons. First, this lack may have occurred because of the presence of a Type II error. That is, a statistically significant association may have existed, that the research was unable to detect. More likely, however, are extenuating circumstances that may have interfered with a positive finding. These circumstances would include the relatively small number of subjects (189) in the study as well as the socio-economic sample of the subjects tested, which was at a fairly high level and not diverse.

Another variable which must be given consideration is the students' mean scores on the *PMMA* and *IMMA* tests which were much higher than those reported in the test manuals. That is, there is not as much variability in the music aptitude of the students in this sample.

It is important to examine closely the reasons why these students scored so far above the national standards established by Edwin E. Gordon. Using the scores of the *PMMA* in grade 1, the students' composite Local Mean was 21 percentile points above the mean established by Edwin E. Gordon. (Local composite mean was 74%, National composite mean was 53%.) Local scores are consistently higher than the National scores in all *PMMA* tests in all areas and grades. It is more difficult to compare the local *IMMA* scores with national scores since Gordon does not provide means or standard deviations for grade 5.

Since the researcher failed to find an association between parents and their biological children, it is interesting to speculate on what may be the primary factor that influences children's musical aptitude. This leads the researcher back to the ancient "nature versus nurture" questions. The results of this study could point to the nurture theory, which would translate into strong environmental influences over a child's musical aptitude.

Regardless of parent's musical aptitude, it appears that in this sample, the parents could have provided their children with rich and varied musical experiences. By the act of volunteering their time to take the *AMMA*, these parents have already demonstrated an extra interest in their children's music education. This could help to explain why the children had such high scores in the *PMMA* test, while their parents adhered more to the National scores of the *AMMA* test.

It could be, however, that the uniting factor within the study may be the musical environment created by the general music teacher. All students in the

research project studied music with the same teacher, who apparently, had provided a rich and varied musical curriculum. When these two factors are examined together, that is, a strong musical environment both at home and at school, it seems plausible to suggest that musical environment, rather than heredity, may have a more decisive role in determining musical aptitude.

CHAPTER FIVE

Summary and Conclusions

Purpose and Problem of the Study

The purpose of this study was to determine if there is a hereditary link between the musical aptitude of elementary students and the musical aptitude of their biological parents.

The problem of the study was to determine if three age specific tests, created by the same author, can be equalized to measure the association of the musical aptitude of students and their biological parents.

Design and Analysis

Eighty-eight students in grades one through five and eighty-one of their biological parents from a middle class suburban New Jersey elementary school voluntarily participated in this study. Tonal, Rhythm and Composite subtest scores, from the *Primary Measures of Music Audiation (PMMA)*, for grades one through three, the *Intermediate Measures of Music Audiation (IMMA)*, for grades four and five, and the *Advanced Measures of Music*

Audiation (AMMA), for adults, were administered within a two week period. All of the tests were authored by Edwin E. Gordon.

The scores of the students' two subtests, plus the composite of the subtests, were compared with the scores of the biological parents' two subtests, plus their composite of the two subtests.

To interpret the association between parents and their children's musical aptitude, the data were organized into three separate 3x3 cross breaks designs for each of the music aptitude subtests of Tonal, Rhythm and the composite of the two. A chi-square analysis using the .05 level of confidence was computed for each of the three cross breaks designs.

Results of the Study

For both subtests of Tonal and Rhythm and also the Composite of the two, the researcher failed to find any statistical significance between the musical aptitude of elementary students and their biological parents.

Conclusions and Recommendations

On the basis of the data acquired in this study, it cannot be concluded that an association exists between the musical aptitude of elementary students and their biological parents. It, therefore, seems probable that environment plays a stronger role than heredity in determining the musical aptitude of children.

The sample of the present study, however, was limited, and therefore, one recommendation would be to replicate the present investigation, using larger numbers in the sample study and a more diverse population. However, the author acknowledges that it may be very difficult to enlist a large sampling of a diverse population of parents, since the essence of the investigation depends upon the motivation of parents to volunteer their time to be tested.

Although this study was designed to examine factors of heredity in influencing musical aptitude, another factor that could have been included in the study is examining the strength of a genetic link. The author believes that the final judgment in determining the answer to the nature versus nurture question will be made in the medical field. It is there that an exact and definitive study may someday be designed that could confirm the absence or presence of a musical gene, or combination of genes, that could possibly be passed on from generation to generation.

It is left to musicians, however, to acknowledge the importance that environment can have in influencing and determining a child's musical aptitude. It is not difficult to conclude that parents can enrich and increase their children's musical aptitude by providing them with a rich and varied musical environment. The motivation of a parent to provide this musical

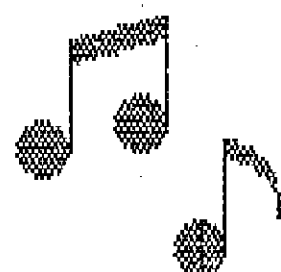
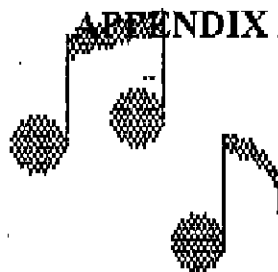
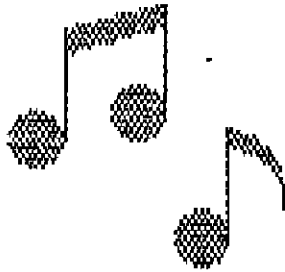
environment does not have to depend on their own musical aptitude. It is much more likely that the motivation to provide a rich musical environment would be because of a parents' own emotional response to things musical, that is, that they enjoy music and are affected by it in a positive manner. This love of things musical could easily be passed on from generation to generation regardless of any genetic link that might be present. Parents also are often motivated to provide activities and experiences that they themselves did not have, giving to their children what they perceive as a lack in their own childhood.

While parents will always have more influence over their children than teachers, it is also important to recognize the role that a general music teacher can play in the development of the musical aptitude of her students. Since many general music teachers teach the same children as they progress from Kindergarten and first grade through fifth or sixth grade, the potential to influence the musical aptitude of children over time is staggering. It is necessary and incumbent on every music teacher to provide a stimulating and varied music environment within the music classroom, utilizing the expertise acquired through the specialized education of a general music teacher. It is equally important for all Boards of Education to acknowledge the importance of music education and to provide the music educators they employ with the rooms and materials that they need to carry on a rich and varied music curriculum.

Children do not exist in a vacuum. They are influenced by numerous variables as they progress through their formative years. Their parents pass on their genetic makeup to their children, as well as creating a home

environment that may help their child to grow and flourish. It appears that when this environment promotes music it can raise the music aptitude of their child. It also seems that if the general music teacher is also presenting a positive and stimulating music curriculum, she will be able to have a positive influence in the development of a child's musical aptitude. When parents and general music educators join together to create rich and varied musical environments then they are providing their children with the opportunity to realize their highest musical potential.

APPENDIX A



2/20/95

Dear Parents,

There is a lot of musical talent at Evans School, and part of my job is to find and nurture that talent.

As you may know, I have been taking courses toward a Masters Degree in Music Education at Rowan College and I have recently begun the final phase of work in writing the required thesis.

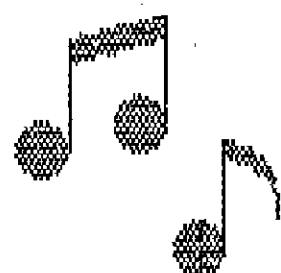
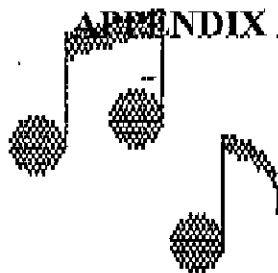
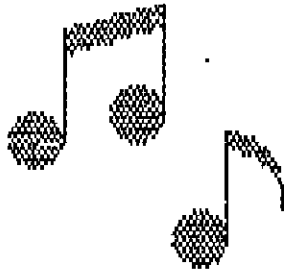
For my thesis I have chosen to examine a possible link between the musical talent or aptitude of my students at Evans School and the musical aptitude or talent of their parents or guardians. There has been little research done on this subject and we will be breaking new ground in this musical field if I can convince enough of you to agree to be tested for your musical aptitude.

The test is very simple and non-threatening. No one is required to sing or perform individually in any way. Rather, the test is a two part test, that asks you to indicate whether you find certain rhythms and melodies similar in nature or different. You write your answers on an answer sheet and hand them to me. Each of the two parts takes about twenty minutes to complete. Neither section is stressful to take.

All the children at Evans will also be taking a musical aptitude test in their general music classes that is similar in nature to yours, but geared to their age group. After all tests have been scored I will be happy to meet with you and share with you the results of your child's test as well as your own.

Meanwhile, my graduate advisor, Dr. Lili Levinowitz, will be guiding me through the maze of crunching numbers, so that we may determine if, or to what extent, heredity plays a part in influencing musical talent. There has been so little research done on a large scale, that at the present time, there is no conclusive answer to this intriguing question.

APPENDIX A



2/20/95

Dear Parents,

There is a lot of musical talent at Evans School, and part of my job is to find and nurture that talent.

As you may know, I have been taking courses toward a Masters Degree in Music Education at Rowan College and I have recently begun the final phase of work in writing the required thesis.

For my thesis I have chosen to examine a possible link between the musical talent or aptitude of my students at Evans School and the musical aptitude or talent of their parents or guardians. There has been little research done on this subject and we will be breaking new ground in this musical field if I can convince enough of you to agree to be tested for your musical aptitude.

The test is very simple and non-threatening. No one is required to sing or perform individually in any way. Rather, the test is a two part test, that asks you to indicate whether you find certain rhythms and melodies similar in nature or different. You write your answers on an answer sheet and hand them to me. Each of the two parts takes about twenty minutes to complete. Neither section is stressful to take.

All the children at Evans will also be taking a musical aptitude test in their general music classes that is similar in nature to yours, but geared to their age group. After all tests have been scored I will be happy to meet with you and share with you the results of your child's test as well as YOUR OWN.

Meanwhile, my graduate advisor, Dr. Lili Levinowitz, will be guiding me through the maze of crunching numbers, so that we may determine if, or to what extent, heredity plays a part in influencing musical talent. There has been so little research done on a large scale, that at the present time, there is no conclusive answer to this intriguing question.

I am hoping that you will agree to partake in this important research. I will be testing during the weeks of March 13-24. If you believe that you will have the time to come to Evans School sometime during those two weeks, please fill out the form that accompanies this letter.

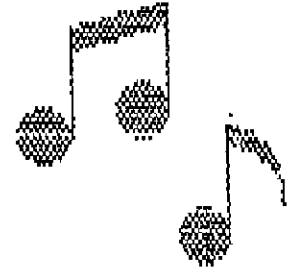
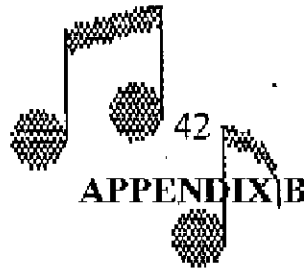
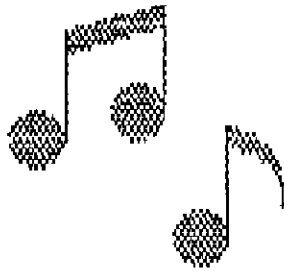
If you are available, I will accommodate your schedule, if at all possible. I will schedule these music aptitude tests for Saturdays, after school and at least one evening during each week. I will administer the test personally and provide jolly ranchers as an added incentive.

I know that there are many musically talented kids at Evans. I work with them every day. I also am aware that many of you have a great interest and love for music. Please help me find out if there is a link between the two. If you have any questions, please do not hesitate to call me at 988-0675.

Sincerely,



Susan Guerrini
Vocal Music Teacher
Evans School



_____ Yes, I am interested in being a participant in the research examining a possible link between my musical aptitude and my child's.

The best time for me to take the music aptitude test during the weeks of March 13 - 24 would be (please circle one)

after school in the evening on Saturday

If you indicated that after school or in the evening is your first choice, please circle which weekday would be best for you.

Monday Tuesday Wednesday Thursday Friday

If you indicated that Saturday would be most convenient for you, please circle the time of day that suits you best.

Saturday A.M. Saturday P.M.

Name _____

Child's Name _____

Child's homeroom teacher _____

Phone number _____

Please return this form to Evans School by Tuesday, February 28, 1995.

APPENDIX C



Could There Be A Music Gene?

By now, you should have received a letter from music teacher Susan Guerrini about a music research project involving you and your child. (If you haven't received that letter, better check that backpack!)

(continued next page)

Mrs. Guerrini is working toward a master's degree in music education at Rowan College in Glassboro. For her master's thesis, she has chosen to explore a possible link between the musical talent and aptitude of a child and the musical skills of the child's parents. According to Mrs. Guerrini, there has been little research on this subject, and her study very well may break new ground in this area.

Here is where we parents come in! Mrs. Guerrini has asked anyone willing to be a "guinea pig" for this study to come to school to take a simple, non-threatening, two-part test of musical aptitude. Don't worry -- you don't have to sing, dance or perform individually in any way, and Mrs. Guerrini has even stocked up on Jolly Rancher candies as rewards!

Meanwhile, at school our children will be taking a similar, age-appropriate test of their musical abilities for comparison purposes. Mrs. Guerrini has said she will be happy to let you know the results of your test and your child's after all the testing is completed.

Mrs. Guerrini will administer the tests, which take about 40 minutes, over the next two weeks during after-school, evening and Saturday appointments.

Why not give it a try? Prove to your young Beethoven or Mozart that he/she really got all that talent from you! Just call Mrs. Guerrini at school at 988-0675 to schedule an appointment.

We wish Mrs. Guerrini much success with her research. We can't wait to hear the results!

APPENDIX D 3/6/95

Dear Parents,

Thank you for your kind response to my letter concerning the musical talents of you and your children.

Below, I have listed the day, date and time that I have scheduled you to come to Evans school to take the musical aptitude test. Please sign the bottom of the paper confirming your assigned time.

If this time is not convenient for you, just let me know and I will be happy to reschedule. I understand that in this crazy, hectic world, conflicts in schedules are bound to occur. I can be reached at Evans school at 988-0675.

The test that you will be taking requires about 35 minutes. It is a listening test, and you will be asked to make decisions about whether the music you hear is alike or different in sound. Your children have taken similar tests already and I will have the results of their tests to share with you when you come to Evans for your test.

I am most gratified that you have been so generous with your time and interest in this subject. I have acquired an extra supply of jolly ranchers and I am looking forward to meeting you during the next few weeks.

Sincerely,

Susan Guerrini
Susan Guerrini

_____ is scheduled to take the Music
Aptitude test at Evans school in the music room on
_____ March _____ at _____ o'clock.

_____ I will be able to take the Musical Aptitude test at
Evans school on _____ March _____ at _____
o'clock.

_____ I will not be able to come at the assigned time. Please
call me to reschedule.

Parent's signature

APPENDIX E

- | | | | |
|-----|--|-----|----|
| 1. | Have you ever taken music lessons? | Yes | No |
| 2. | Has your child ever taken music lessons? | Yes | No |
| 3. | Have you ever been part of a musical group?
(Such as a band or chorus) | Yes | No |
| 4. | Has your child ever been part of a musical
group? | Yes | No |
| 5. | When your child was younger did you or your
spouse ever sing to him/her? | Yes | No |
| 6. | Do you or your spouse sing with your child
now? | Yes | No |
| 7. | Do you think of yourself as having some
musical talent? | Yes | No |
| 8. | Do you think of your child's other parent as
having some musical talent? | Yes | No |
| 9. | Do you think of your child as having some
musical talent? | Yes | No |
| 10. | Is there anyone else in your family
(for example, an aunt, uncle,
grandparent etc.) that has musical talent? | Yes | No |

Comments: _____

Name _____

Child's Name _____ Grade _____

Homeroom Teacher _____

APPENDIX F

Josh C. Grade 2

Composite Raw Score = 71 out of 80

Very High Music Aptitude

APPENDIX G

Dear Lori,

You did well on the test. You scored in the high average category overall with a particular strength in rhythm recognition.

It was a pleasure to meet you.

Thanks again,

A handwritten signature in cursive script, appearing to read "Sue".

Sue Guerrini

BIBLIOGRAPHY

- Galton, F. *Hereditary Genius*. London, England: Macmillan, 1869.
- Gordon, Edwin E. *The Nature, Description, Measurement, and Evaluation of Music Aptitudes*. Chicago, Illinois: G.I.A. Publications, 1987.
- Holahan, John M. "Toward a Theory of Music Syntax: Some Observations of Music Babble in Young Children," *Music in Child Development*. Edited by J. Craig Peery, Irene Weiss Peery and Thomas W. Draper. New York, New York: Springer Verlag, 1987.
- Levinowitz, Lili M. and Guilmartin, Kenneth K. "Understanding and Enhancing the Young Child's Music Development." *Music and Movement Center*. Princeton, New Jersey: (1993).
- Scheinfeld, Auram. *The New Heredity and You*. London, England: Chatto & Windus: 1956.
- Seashore, Carl E. *Seashore Measures of Musical Talent*. New York, New York: Columbia Phonograph Company, 1919.
- Shuter-Dyson, Rosamund. "Hereditary and Environmental Factors in Musical Ability." *The Eugenics Review* 58 (1966).
- Shuter-Dyson, Rosamund and Gabriel, Clive. *The Psychology of Musical Ability*. London, England: Cambridge University Press, 1981.
- Stanton, Hazel Martha. "The Inheritance of Specific Musical Capacities," *Psychological Monographs*, 31 (1922).
- Stanton, Hazel Martha. "Measurement of Musical Talent: The Eastman Experiment," *Studies in the Psychology of Music* II (1935).
- Wilkin, P.E. *Prenatal Perception, Learning and Bonding*. Berlin, Germany: Leonardo Publishers, 1993.

Wing, H.D. *Manual for Standardized Test of Musical Intelligence*.
Sheffield, England: City of Sheffield Training College, 1948.

Woodward, Sheila C. "The Window of Opportunity" *International Society
for Music Education Early Childhood Commission Seminar: Vital
Connections: Young Children, Adults & Music*. Columbia, Missouri:
University of Missouri, (1994).

