

The Relationship Between Instrumental Music Instruction and  
Reading Achievement in Third, Fourth, and Fifth Grade Students

by

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## **Abstract**

The purpose of this study was to compare reading performance among third, fourth, and fifth grade students who participated in instrumental music instruction with performance of those who did not participate in instrumental music instruction. The measurement tool for reading performance was the Fountas and Pinnell Benchmark Assessment, 2<sup>nd</sup> edition. This study used a pretest/posttest design to compare reading level data from October 2013 to reading level data from May 2014 for students participating or not participating in instrumental music instruction. Students participating in band and strings performed significantly better than those who did not, though results could be attributable to a number of factors. Research in the area of music instruction's benefits to reading performance should continue to better determine the amount and type of instruction that is most useful as well as the specific ways in which music can improve student performance.

## CHAPTER I

### INTRODUCTION

In his book, *Music with the Brain in Mind*, Eric Jensen (2000) states that children are ready to learn a musical instrument by about age ten. However, students' school-based access to instrumental music instruction during the elementary school years varies greatly. Some schools offer no opportunities to learn to play a musical instrument, while others offer a variety of avenues for instrumental study. These can range from classroom experiences with Orff instruments, such as xylophones and metallophones, to small group lessons on a variety of band and orchestra instruments. When offered, formal instrumental instruction in the schools may begin as early as third grade with orchestra instruments such as violin, viola, cello, and double bass. Band instruction may begin in fourth grade with students able to select brass instruments such as trumpet, trombone, baritone, and tuba or woodwinds like flute, clarinet, and saxophone.

How much of a difference can this range of exposure make for children? Many students enjoy their music classes, and even schools without instrumental music programs may offer general music instruction. Brain research shows that musical study has a strong impact on our brains; processing music involves multiple regions of the brain (Peretz & Zatorre, 2005). Further, musical performance activates even more areas within the brain (Jensen, 2000).

Learning to play a musical instrument in the later elementary school years provides students with both cognitive (academic) and emotional (artistic) benefits. According to Jensen (2000), Dr. Gordon Shaw and other researchers believe that music enables the brain's functions to integrate better with each other, leading to improvements in cognition and memory. Both listening to music and, especially, performing, enhance the ability to recognize emotions, control impulses, and reduce stress (Jensen, 2000). When students' emotions are well-managed, they are

more available for learning and better able to take advantage of the cognitive benefits that music provides.

More specifically, however, how does learning to play a musical instrument affect a student's performance in reading? There are direct parallels between the processes of reading words and reading music. The elements of reading, namely, phonemic awareness, phonics, fluency, vocabulary, and comprehension, all have musical counterparts. Focusing on one domain could reasonably translate to gains in the other. Similarly, expression in reading and expression in music both help make the passage's meaning clear. The importance of reading skill and the value of musical performance make the question of how the two are related one worth pursuing.

### **Statement of the Problem**

This study seeks to evaluate the relationship between instrumental music instruction and reading achievement in third, fourth, and fifth grade students. Is there a difference in the overall reading performance of students who study a musical instrument, compared to those who do not? The information gained from the study would be valuable in helping to determine future plans for musical offerings within the school.

### **Hypothesis**

The results will show no significant difference in the reading performance of students who study a musical instrument compared to those who do not. The minimal amount of instructional time devoted to instrumental music instruction at the elementary level, as well as the likelihood that students have only studied their instrument for a short time, will contribute to this outcome.

### **Operational Definitions**

The independent variable for this study is whether a student has had instrumental music instruction. Instrumental music instruction is defined as formal, school-based lessons on a musical instrument. Students were also asked about private music lessons, although this data was not included when determining whether a student was considered to have had instrumental music instruction for this study.

The dependent variable is a student's reading performance. This was determined by using the Fountas & Pinnell Benchmark Assessment, 2<sup>nd</sup> Edition. This is a one-on-one assessment that provides a reading level from A through Z. It was administered to students in October for a baseline and again in May to determine progress.

## **CHAPTER II**

### **REVIEW OF THE LITERATURE**

This literature review seeks to explore the impact of music study on reading performance. Section one provides an overview of the reading process. Section two describes how the brain processes music. Section three examines parallels and similarities between written language and music. Section four describes ways in which studying music can benefit reading performance, and in section five, a summary is provided.

#### **The Reading Process**

Learning to read is not a process that begins in school. Rather, children begin learning about print and its role in our culture and our lives at about age two, when they start to differentiate between drawing and writing (Goodman, 2008). Different philosophies of the best way to teach reading nonetheless share certain key elements. Phonemic awareness, or the understanding that words are made up of individual sounds, is among the earliest skills needed for reading (Ehri, 2011). Along with this, children need to recognize the conventions of print, for example, that the symbols on the page represent words, and that in English we read from left to right and from top to bottom (Goodman, 2008). All of this instruction can begin well before a child enters formal schooling (Goodman, 2008).

Readers also need to know phonics, or the sounds made by each letter or combination of letters, which children begin to recognize at age five or six (Goodman, 2008). The relationship between the written letters, or graphemes, and the sounds they make enables readers to piece together or decode words (Ehri, 2011). This can and should be taught using a number of techniques or angles. Direct teaching of letters and their sounds is useful. Interacting with words, manipulating them, and finding “analogies” among groups of words is another powerful



activity for teaching phonics. For example, through word study, students learn that the words *name* and *blame* follow the same pattern (Ehri, 2011). By focusing on patterns such as these across words, new readers learn to decode new words more quickly.

Another important piece of the reading puzzle is fluency, or the ability to read quickly, smoothly, and with expression. Fluency is important for making meaning, because being able to read with automaticity leaves more brain power available for comprehension (Rasinski, 2011). Whether reading silently or out loud, fluency is an integral part of the overall reading picture. Oral reading rate, or oral reading fluency, has been linked to comprehension and reading comprehension achievement (Rasinski, 2011). Oral reading helps readers develop prosody, the skill of reading with expression. Prosody is important, in part, because we develop meaning from the sound of the words as well as from their appearance (Rasinski, 2011).

Readers' theatre, in which students take roles and read a script aloud, is one activity designed to focus on fluency. Readers' theatre activities can be used from elementary school through high school (Rasinski, 2011). The practice and performance involved make the experience enjoyable, and these productions can be simple or elaborate. Even silent reading supports fluency (Rasinski, 2011). Wide reading, or spending shorter amounts of time on a many different texts, and deep reading, spending an extended amount of time reading, re-reading, and working with a single text, both have value for fluency (Rasinski, 2011). These tools for teaching fluency all focus on speed and automaticity as well as on prosody and comprehension, for reading quickly is of no use if the reader cannot make meaning. It is also important to note that while fluency may seem to be geared toward oral reading, the benefits of fluency practice apply to silent reading as well (Rasinski, 2011).

Vocabulary is another key element of learning to read, and a balanced vocabulary program is crucial. This includes engaging in a variety of reading and writing experiences, focusing directly on words and their meanings, learning strategies for discovering the meanings of unfamiliar words, and becoming aware of words and how they are used (Fisher, Blachowicz, & Watts-Taffe, 2011). These strategies are incorporated into activities throughout the day and across content areas, making the study of vocabulary an ongoing adventure that is embedded into each day's lessons (Fisher et al., 2011).

New words can be directly taught or inferred from context. However, especially as students progress to fourth grade and beyond, a focus on the meanings of word parts, or morphology, can help readers figure out the meanings of unfamiliar words (Goodwin, Lipski, & Ahn, 2012). Fourth grade is also the time when texts become more complex as the reading demands in the content areas increase (Goodwin et al., 2012).

All of the elements of reading outlined so far work toward the ultimate goal: comprehension. The ability to understand what is read is, after all, the most important thing. Beginning in the pre-school years, children notice and start to understand that our spoken words can also be written down. Phonemic awareness is a focus of pre-K, kindergarten, and first grade reading lessons. This gives way to phonics, associating those sounds with their written counterparts, as an important part of first and second grade classrooms. More attention is paid to reading fluently from third grade on (Goodman, 2008). Vocabulary is studied in more depth as students progress as well, with those in fourth grade and beyond looking at word parts to help define unfamiliar words. Synthesizing these skills and using them to read authentic texts such as trade books, song lyrics, magazines, and other forms of print ultimately lead to successful readers (Goodman, 2008).

## **The Brain and Music**

The human brain is a fascinating thing. Its many regions interact in surprising ways to perform an incredible array of tasks, from keeping our hearts beating and our lungs breathing to creating and responding to music. There are auditory, visual, motor, memory, and emotional aspects of music to consider. Just how does the brain process music?

Peretz and Zatorre (2005) examined how the brain processes music from a neuroscientific perspective. Looking at both temporal (rhythm) and pitch-related (melody) examples, as well as emotional and memory-related issues, they described the many regions of the brain that must activate. To process music, one must rely on perception, motor, memory, emotional, and cognitive functions which use resources from many areas within the brain. Our culture plays a role as well; musical patterns common to the music of our culture (e.g., Western music in the United States) become familiar and therefore easier to process at a very young age (Peretz & Zatorre, 2005).

Jensen's (2000) book, *Music with the Brain in Mind*, examines, in less technical language, how music and the brain interact. Jensen explains how the brain relates to music in terms of cognitive, emotional, perceptual-motor, stress response, and memory systems. Perceiving music is a complex activity that involves both hemispheres of the brain (Jensen, 2000). Performing music is even more complex, activating still more regions of the brain, and listening for a purpose, rather than simply for enjoyment, activates different parts of the brain (Jensen, 2000).

Our relationship with music begins in infancy, if not before. Even newborns show preference for certain types of music, and before one year of age, infants can recognize different melodies as well as changes to a familiar tune (Jensen, 2000). Toddlers and preschoolers can

begin playing simple instruments, and some are ready to be introduced to piano or violin (Jensen, 2000). By elementary school age, children can compose melodies and are ready to learn an instrument. From age ten and up, training and practice are the biggest factors in musical success. However, making music has benefits that go beyond the music itself (Jensen, 2000).

Some scientists, most notably Dr. Gordon Shaw, theorize about a “neural symphony” (Jensen, 2000, pp. 31–32); that is, the idea that music enhances or creates coherence among brain functions, allowing them to process more complex functions, including those in memory and cognition. There is also some evidence to support the theory that music study improves math skills, at least in spatial-temporal reasoning ability, “which is considered a key building block for higher math skills (specifically geometric and topological)” (Jensen, 2000, p. 35).

Music has also been shown to improve emotional intelligence, which is, in part, the ability to identify emotions, to express them appropriately, to control impulses, and to reduce stress (Jensen, 2000). Listening to music helps with these skills. Performing, however, adds another level. The constant feedback from performing may enable the brain to form neural networks that foster the development of emotional intelligence (Jensen, 2000).

“The more one is exposed to music making, the more changes occur in the brain’s neural map” (Jensen, 2000, p. 53). Interestingly, it seems that the greatest changes to the neural map of the brain’s cortex occur in musicians who use their hands the most. Similarly, the cerebella of musicians were on average five percent larger than those of non-musicians; the cerebellum is active in maintaining beat and rhythm. An even larger difference of fifteen percent in the size of the corpus callosum (the fibers that connect the left and right hemispheres of the brain) has been seen in musicians as compared to non-musicians (Jensen, 2000).

Studies have suggested that “rhythm therapy” (Jensen, 2000, p. 56) can help improve students’ behavior and improve speech patterns in brain-damaged adolescents. Another study showed positive improvements in focus, mood control, and social skills of ADD/ADHD children when they participated in listening and feedback sessions using Mozart’s music. The effects were generally maintained six months later (Jensen, 2000). Visual and motor skills may also be enhanced by studying music, as seen in a study in which 3- to 6-year-old students studied Suzuki music for four months (Jensen, 2000). Even physical strength and muscle control may be positively affected. Some trainers use rhythmic music to help runners and swimmers improve their times (Jensen, 2000).

Because the human body has a constant, innate vibration, it should not be surprising that music’s rhythms can effect physical changes (Jensen, 2000). Music’s ability to affect our emotions is well-known, and it is also well-known that stress can affect our physical health. Music has also been shown to reduce levels of the stress hormone cortisol, and to increase melatonin, norepinephrine and epinephrine levels (Jensen, 2000). Since these hormones affect both emotional and physical health, music’s beneficial effects here should not be overlooked.

Music benefits our memory system both by focusing our attention on rhythm, timbre, pitch, and emotion, and by “activating multiple memory pathways” (Jensen, 2000, p. 69) for explicit (conscious) and implicit (unconscious) memory. Different music tasks use different areas of the brain, such as episodic memory for storing the circumstances around a particular musical experience; semantic memory for sight-reading or discussion about music, and reflexive memory for automatic tasks like tapping a beat (Jensen, 2000). Even simply listening to music gives our brains a workout that can enhance our ability to listen to other things.

## How Music and Reading Are Related

There are some obvious similarities between reading text and reading music. Both involve the interpretation of written symbols into sounds. Both progress from left to right on the page (Corrigan & Trainor, 2011; D'Agrosa, 2008). The ability to recognize words and notes at sight is another parallel (Hansen & Bernstorff, 2002). Both reading and music benefit from adding feeling; we call it *prosody* in reading and *expression* in music. Jensen (2000) states, "When musicians read music, they use an area of the brain in the right hemisphere that is normally associated with reading text" (p. 55). As with text, the different elements of reading music are processed in different parts of the brain then synthesized into the finished product (Perret & Fox, 2006).

Other studies support similar connections. Slevc, Rosenberg, and Patel (2009) tested the theory that linguistic processing and music processing share the same resources in the brain. Their results supported the theory that the same areas of the brain process linguistic syntax and musical syntax. Banai and Ahissar (2013) investigated the relationship between auditory processing and reading accuracy, verbal memory, phonological awareness, and general reasoning abilities. Their findings supported the theory that some amount of musical training does improve these reading skills.

The elements of reading described earlier also relate to reading music, especially in songs with lyrics. Individual sounds in both text and music must be recognized (phonological awareness) and associated with symbols (phonics) (Banai & Ahissar, 2013; Perret & Fox, 2006). Automatic and timely reading (fluency) is crucial for accurate performance. Music has its own set of vocabulary that must be learned, and song lyrics may present new vocabulary words. In addition, each piece of music is tied to a time and place in history and culture. All of these

elements must be combined to create a performance that is more than isolated notes strung together; they must be synthesized in order to generate comprehension. Just as understanding what is read is the ultimate goal of reading, creating a coherent performance that goes beyond stumbling through notes and rhythms is the goal of making music.

### **How Music Instruction Benefits Reading Achievement**

Music can be beneficial to reading in many ways, some obvious and some subtle. Jensen (2000) cites a study in which music was added to a kindergarten reading program. The students with the music component performed better on recall and had fewer errors in substitution and omission, supporting the idea that “music facilitates verbal memory” (Jensen, 2000, p. 73). Another study showed that adding background music that matched the mood of the reading selection improved students’ memory of the text (Jensen, 2000).

Forgeard et al. (2008) found correlations between aspects of music and reading at a variety of ages from pre-school through late elementary school. Banai and Ahissar (2013) noted that in students with no musical training, auditory processing skill is correlated to verbal and working memory, reading accuracy, and phonological awareness. Corrigan and Trainor (2011) found a strong correlation between the number of years of music training and reading comprehension among 6- to 9-year-old students. Darrow (2008) cites a meta-analysis of 25 studies, which supports the theory that music can help improve reading ability. In fact, Darrow states that when the music activities focus on specific reading skills, the improvement can be significant.

Music training may also be useful for students with dyslexia, which is a problem with phonological processing. The deficits in dyslexia include weaknesses in rhythm and pitch discrimination and difficulty learning to read music (Forgeard et al., 2008). By training students

to listen to nuances in musical sound, we may be able to strengthen students' skills in phonemic awareness, thereby benefitting those with dyslexia (Perret & Fox, 2006). In addition, studies have shown correlations between students' pitch discrimination and their ability to read, and between sensitivity to rhythm and vocabulary, reading, and spelling (Jensen, 2000). Music therapists can assist students with special needs by using music to help teach specific reading skills (Darrow, 2008).

In a Brazilian study, Cogo-Moreira, de Ávila, Brand, Ploubidis, and Mari (2013), showed promising results that music education helps improve reading skill, although the results were not strong enough to lead to the inclusion of music education across the board there. Certainly, more study is needed and questions remain. However, there is significant evidence that music education is beneficial in a variety of ways.

### **Conclusion**

Reading and music share many similarities, and many studies have attempted both to identify them and to determine how they interact. Whether singing, listening, or playing instruments, studying music involves learning to read it. This provides at least one clear link between the two disciplines. Future research will continue to examine the relationship between reading and music and, hopefully, help us understand how we can use one to improve the other.



## **CHAPTER III**

### **METHODS**

#### **Design**

The purpose of this study was to determine the relationship between instrumental music instruction and reading performance in third, fourth, and fifth grade students.

This was a causal-comparative study that compared the reading performance of third, fourth, and fifth grade instrumental music students with the performance of students who did not study a musical instrument. Students completed a survey to determine their level of instrumental instruction. Reading performance was evaluated using a teacher administered reading assessment that was administered in October and again in May.

The independent variable for the study was whether or not students received instrumental music instruction at school. The dependent variable was their reading achievement in May as compared to their baseline from October.

#### **Participants**

This study was conducted at an elementary school in Anne Arundel County, Maryland, just outside Annapolis. It is a middle-class area, and the school has approximately 500 students in kindergarten through fifth grade. The student population is predominantly white, with an increasing number of minority and English Language Acquisition students from a variety of cultures. The third, fourth, and fifth grades comprise 196 students, of which 139 are or have been part of the band and strings programs.

The school's performance on Race to the Top tests has been strong, although achievement gaps are noticeable between white and African-American students. The special

education population is large, as the school is one of just a few sites for multiple intensive needs children (MINC).

Students have the opportunity to participate in strings beginning in third grade. They may choose to study violin, viola, cello, or double bass. In fourth grade, instruction on band instruments is also offered. Students may study trumpet, trombone, baritone horn, tuba, flute, clarinet, saxophone, or percussion. Each instrumental ensemble typically has about 25 students per grade, although a few drop out each year. In addition to the strings and band programs, which are graded, optional classes offered during the school day, fourth and fifth grade students can join the optional, graded chorus class. Extra-curricular, ungraded handbell, and recorder ensembles are available at different times during the year.

### **Instruments**

All students completed a survey to help determine whether they received instrumental music instruction. The survey asked whether the student had ever participated in band or strings, the instrument studied, and for how long. This is the data that relates directly to the study's purpose. In addition, students were asked whether they had ever taken private lessons on their school instrument or on another instrument. This information was used to provide additional insight into the study's results. This survey was developed by the researcher and has not been reviewed. Therefore, its validity and reliability cannot be determined.

To determine reading achievement, classroom teachers administered the Fountas and Pinnell Benchmark Assessment, 2<sup>nd</sup> Edition, to their students. This is a one-on-one assessment that provides an overall reading level indicated by a letter from A to Z. The test was administered in October to obtain a baseline reading level and again in May to determine

progress. Most notably in the upper grades, not all students were tested, which reduced the size of the sample.

### **Procedures**

Musical instruction was defined as participation in the school's band or strings program. Students in band or strings receive two 30-minute small-group lessons per week. They perform at least twice during the school year. Although participation is optional, students in band or strings receive a report card grade for the class.

To determine whether a student should be considered to have had musical instrument instruction, students completed a survey that asked about school-based and private lessons. Questions included whether the student had ever participated in band or strings, the instrument studied, and the length of time studied. The survey went on to ask whether the student had taken private lessons on his or her school instrument. Finally, the survey asked whether the student had ever taken lessons on another instrument outside of school, which instrument, and for how long. All third, fourth, and fifth grade students completed the survey during their general music class. The pencil and paper survey took about ten minutes to complete.

Each student's reading level and advancement over the school year were determined using the Fountas and Pinnell Benchmark Assessment, 2<sup>nd</sup> Edition. Classroom teachers administered this assessment individually to their students in October and again in May. The testing incorporates reading fluency and comprehension, resulting in a lettered reading level between A and Z. To determine reading achievement, progress from October to May was evaluated. The results were then compared between the instrumental music students and the non-instrumental students.

## CHAPTER IV

### RESULTS

The purpose of this study was to evaluate the relationship between instrumental music instruction and reading achievement in third, fourth, and fifth grade students.

The pretest and posttest results for students participating and not participating in strings and band were analyzed using a t test for independent groups. The results are presented in Table 1 below.

Table 1

*Reading Pretest and Posttest Results for Students Participating and Not Participating in Strings and Band*

Test	Group	Mean	N	Standard Deviation	t	Significance
F&P Pretest	No Band/Strings	15.2	27	2.54	3.23	0.002*
	Band/Strings	16.8	78	2.19		
F&P Posttest	No Band/Strings	17.7	27	2.60	2.58	0.01*
	Band/Strings	19.1	78	2.18		

\*p< or = 0.01

Both the pretest and posttest mean reading scores for students participating in either strings, band, or both was significantly higher than the reading mean for students who did not participate. In order to control for the significant pretest mean reading scores, an analysis of covariance was conducted controlling for the pretest score. In the corrected model, the Mean Square = 222.87, F= 173.19, and the significance was 0.000. This means that after adjusting for the significant pretest scores, the reading posttest scores for students participating in strings, band, or both remained significantly higher than the reading mean for students who did not participate.

The hypothesis that there would be no significant difference in the reading performance of students who participated or did not participate in band or strings was rejected. Students who participated in band or strings showed a higher reading level than students who did not participate, even when the differences in pretest levels were controlled using ANCOVA.

## **CHAPTER V**

### **DISCUSSION**

#### **Results**

A comparison of the reading performance levels of students who participated and who did not participate in instrumental music instruction revealed a significant difference between the two groups. There were 78 students who participated in band or strings and 27 students who did not participate. Individual Fountas and Pinnell testing in October and again in May revealed a mean pretest score of 16.8 levels for those who participated in band and/or strings, compared to a mean pretest score of 15.2 for students who did not participate in band or strings. Students participating in band or strings had a mean posttest score of 19.1, compared to 17.7 for students who did not participate in band or strings.

A t-test for independent groups returned a t-value of 3.23 for the pretest and a t-value of 2.58 for the posttest. The significance was 0.002 for the pretest and 0.01 for the posttest. Both of these values show that the differences between students participating in band and strings and those not participating are significant.

#### **Implications**

This study did not consider student differences other than whether or not each student participated in instrumental music instruction during school. However, the significant results of the research suggest that encouraging students to participate in instrumental music study (i.e., band or strings at school) could be helpful. There are, of course, many individual differences among students beyond their participation in instrumental music instruction. Aptitude for reading, music, or both could impact a student's performance.

The processes of reading text and reading music share many similarities, which makes studying musical performance valuable as reinforcement for reading text. Not only are music and English both read from left to right and from top to bottom, but there are parallels in phonemic awareness, phonics, fluency, vocabulary, and comprehension as well.

The results of this study support other research that has found musical study to benefit reading performance, as well as performance in many other mental tasks. The results also reinforce the philosophy that musical instruction should remain a valuable part of elementary education, whether or not its specific benefits to reading are considered.

### **Threats to Validity**

Many factors surrounding this research may have affected the results. The study only considered instrumental music instruction provided through the school. Private lessons on the student's school instrument or another instrument were not taken into account. Thus, students who did not participate in band or strings but did take piano lessons were not properly represented. Similarly, students' practice habits were not considered. A student with three years of school instruction on clarinet who did not invest any time in at-home practice was treated the same way as a student with three years of clarinet instruction who practiced daily and also took piano lessons. In addition, socioeconomic factors may prevent some students from taking private lessons in spite of interest and/or aptitude.

While the group size for this research was adequate, not all students in grades 3, 4, and 5 were included. Classroom teachers performed the Fountas and Pinnell testing, and each teacher selected a group of students to be tested. Without control over the sample, it is unknown whether the chosen students comprised a representative sample of the student population.

Students' reading habits outside of school were also unknown and uncontrolled. Some students spend more time reading and may also have a home environment that supports or encourages reading. Thus, without regard to a student's initial reading level, some students may be predisposed to make more progress due to factors at home, and the same could be true in reverse.

### **Connections to Previous Research**

The findings of this study are consistent with the results of other research. Cogo-Moreira et al.'s 2013 study in Brazil produced similar improvements in student reading performance when music was added to the school curriculum. Research from Slevc et al. (2009) reinforced the theory that the same areas of the brain process linguistic syntax and musical syntax. Correlation between the number of years of music training and reading comprehension was shown in in Corrigan and Trainor's 2011 research that studied elementary school students. Darrow's 2008 research cited a meta-analysis of 25 studies, which supports the theory that music can help improve reading ability.

All of this earlier research produced positive results similar to those of this study. The Fountas and Pinnell testing used to determine reading level encompasses a variety of reading skills, including word identification and comprehension components. The Analysis of Covariance showed higher reading performance in students who studied a musical instrument. From phonological awareness through comprehension, the parallels between reading music and reading text are easy to see. The similarities in how the brain processes elements of reading and elements of music also add to the case in favor of music training as a way to help improve reading performance. As Jensen (2000) explains, "When musicians read music, they use an area of the brain in the right hemisphere that is normally associated with reading text" (p. 55). This



suggests that students learning a musical instrument are getting an extra reading-related workout every time they sit down to play. In this research study, as in many others, it appears that these workouts are producing good results.

### **Suggestions for Future Research**

This limited study left many questions unanswered. Because of its small scope, we can gain only the most general information, and the results cannot be generalized to the population at large. Would considering or controlling for other factors, such as students who take private lessons or students who have support at home for reading and/or music, have made a difference in the results? Is there a difference in performance level based on instrument? That is, do students who play violin do better than students who study clarinet? What factors might contribute to the differences? Does studying multiple instruments have a greater impact than merely learning a single instrument?

To help compensate for some of these unknowns, future research should consider all forms of instrumental music instruction. A more longitudinal design, in which the study follows students over their entire elementary school careers and perhaps beyond, would also provide more comprehensive and accurate data.

Music's positive impact on many mental processes has long been touted. Combining this general knowledge with the understanding that reading is a vital skill, it becomes clear that we should learn all we can about how the two disciplines work together.

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## Appendix A: Instrumental Music Survey

### Instrumental Music Survey

1. Have you ever played an instrument (band or strings) at school?      Y      N
2. If so, what instrument:
  - a. Violin
  - b. Viola
  - c. Cello
  - d. Bass
  - e. Flute
  - f. Clarinet
  - g. Saxophone
  - h. Trumpet
  - i. Trombone
  - j. Baritone
  - k. Tuba
  - l. Percussion
3. How long did you take lessons?
  - a. Less than one school year
  - b. One full school year
  - c. Between one and two full school years
  - d. Two full school years
  - e. Between two and three full school years
  - f. Three full school years
4. Do you take private lessons on your school instrument?      Y      N
5. For how long?
  - a. Less than one school year
  - b. One full school year
  - c. Between one and two full school years
  - d. Two full school years
  - e. Between two and three full school years
  - f. Three full school years or longer
6. Do you take lessons on an instrument that is not offered at school (e.g., piano, guitar, harp, etc.)?      Y      N
7. What instrument? \_\_\_\_\_
8. For how long?
  - a. Less than one school year
  - b. One full school year
  - c. Between one and two full school years
  - d. Two full school years
  - e. Between two and three full school years
  - f. Three full school years or longer