

EXPLORING THE RELATIONSHIP BETWEEN AFFECTIVE DISPOSITION AND NAEP MUSIC SCORES

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ABSTRACT

This study presented a secondary analysis of the National Assessment of Educational Progress (NAEP) data set. The paper explored the relationship between affective disposition and average scores on the 2016 NAEP music assessment for eighth-grade students. To gain a better understanding of the relationship between students' affective disposition and average music scores, this study used a quantitative descriptive research design to analyze the secondary data extracted from the 2016 NAEP data set. The findings include (1) students who agreed that they had a talent for music had significantly higher average music scores. (2) Students who had been told by others that they are good musicians had significantly higher average music scores. (3) Students who reported that they liked playing music for others had significantly higher average music scores. These findings indicate that budget constraints and cuts to music education in public schools may limit student intelligence and the development of a positive self-concept.

Keywords: NAEP, Student, Music Education, Self-Concept, Multiple Intelligences.

1.0. INTRODUCTION

Music is often called a universal language (Gottlieb, 2019). Therefore, the importance of music education cannot be overstated. Research suggests that music education at a young age "sets up children's brains to make them better learners by enhancing both sound processing in the brain and cognition" (Kraus & White-Schwoch, 2020, p. 210). Further research has identified music education as being beneficial to language development, memorization, and coordination (NAfME, 2014). However, many students are not engaged in music or do not have access to music education in school. As a result, students' musical self-concept and affective disposition toward music will vary based on their prior experiences with music education.

1.1 Research Problem

The purpose of this research is to explore the relationship between students' affective disposition and their 2016 NAEP eighth-grade music scores.

In addition to the previously stated benefits of music education, students who identify as musicians were found to be more likely to develop long-lasting social relationships with others (Martin, 2020). Music can teach students valuable lessons on self-reflection and assessment (Herb, 2022), which may improve their self-concept and academic performance (Hash, 2017). Music can also serve as an entry point for new content and encourage discussions by

introducing music to the classroom (Mills, 2001). Research has shown individuals with higher musical self-concepts are also more likely to attain higher levels of musical creativity (Mawang et al., 2018).

1.2 Deficiencies in Evidence

Further research on this topic is needed to understand the relationship between students' affective disposition and their music scores. Existing research suggests that higher self-concept correlates to higher levels of academic achievement, but students may also consider themselves good musicians and still perform poorly on a standardized test. Few studies have analyzed the relationship between students' affective dispositions and their NAEP music scores. This study explores whether eighth-grade students with a higher musical self-concept had higher average scores on the 2016 NAEP music assessment.

1.3 The Audience

The primary audiences for this research are educators and parents looking to understand how students' self-concepts and perceptions of their abilities relate to achievement in academic assessments. Educators could use this information to modify their lesson plans to accommodate students with higher or lower self-concepts. Additionally, administrators may be interested in the relationship between students' affective disposition and music test scores. These findings could inform policies and recommendations for students struggling with music education. This study focused on three student-reported questions to better understand students' affective disposition.

1.4 Research Questions

1. How much do you agree with each of the following statements?

I think I have a talent for music.

2. How much do you agree with each of the following statements?

People tell me I am a good musician.

3. How much do you agree with each of the following statements?

I like to play music for other people.

Our theoretical framework for this research adopts a scientific inquiry-based approach. The Scientific inquiry-based approach, according to the National Science Education Standards (NRC, 1996), the Benchmarks of Science Literacy (AAAS, 1994), the International Society for Technology in Education, (ISTE, 2014), and Next Generation Science Standards (NGSS, 2013), is investigation driven and science process initiated. It also goes beyond the mere development of process skills such as observing, inferring, questioning, interpreting and analyzing data. It combines these processes with scientific knowledge, scientific reasoning, and critical thinking to develop scientific knowledge (Lederman, Antink, & Bartos, 2014). Scientific inquiry will guide us in examining the nature of the data (Yao, Zhong, & Zhao,

2008). By following the scientific inquiry, we will begin with an extensive exploration of the dataset (NAEP) and then design our data-based research questions to mine the data systematically since there is no single set of sequential steps to follow in the scientific inquiry (Lederman et al., 2014; Sandoval, 2005). The focus of the research is the goal of the data mining – the discovery of knowledge from data (Piatetsky-Shapiro, 1996). With the scientific inquiry-based approach and data mining focus, we established our theoretical framework for this quantitative data mining research.

2.0 LITERATURE REVIEW

According to data reviewed by the Arts Education Data Project (AEDP), approximately 8% of public school students did not have access to music education during the school day in 2019 (Yamaha Staff, 2022). While that means 92% of public school students had access to music education, fewer than half of all students participated in music education (Yamaha Staff, 2022). This is alarming for a number of reasons, but it is not surprising because music programs are often at risk when school districts are faced with budget cuts. This is because of the high cost of instruments, as well as the lack of support from parents and school administrators (Peralta, 2021). However, music education gives students chances to improve their musical intelligence, teaches important lessons about practice, and may improve nonmusic academic achievement.

2.1 Understanding Music as a Form of Intelligence

Musical intelligence is one of the eight bits of intelligence that Gardner (1987) used to define the Theory of Multiple Intelligences. Individuals who have developed their musical intelligence have been found to be more likely to associate their thoughts with a melody or tone, appreciate more aspects of music, play musical instruments, compose musical pieces, or listen to music more (Bartolomei-Torres, 2022). Gardner (1987) provided an example of musical intelligence by stating, "Leonard Bernstein has lots, Mozart had even more" (p. 28). However, that does not mean listening to Mozart will make you smarter.

Although prior research showed that listening to Mozart can improve IQ test scores, it is more likely that listening to music simply helps to reduce stress and improve focus (Musacchia & Khalil, 2020, p. 2). Musical intelligence can also benefit students in nonmusic classrooms where educators may use music in their lessons to help encourage discussions or to introduce new subjects. Similar to the other intelligence in Gardner's theory, musical intelligence can "be exploited as a means of transmission, often referred to as an entry point or catalyst for learning all manner of content" (Mills, 2001, p. 4). Educators can use music to connect with students in nonmusic classrooms by playing songs related to the content for students to discuss.

While listening to music can decrease stress, improve focus, or serve as an entry point for new material, learning how to play instruments and write music has been shown to improve brain function in the auditory system, as well as helping with the development of motor skills, reading, and socio-emotional awareness (Musacchia & Khalil, 2020, p. 3). This is key to understanding why so many schools encourage students to learn an instrument at an early age. Music teaches children practical skills and valuable life lessons that could help them in other subjects.

2.2 Practice Makes Perfect: What Music Education Teaches Students

Providing students with music education can do more than just improve their ability to play instruments and write pieces of music. Student performance in music education has been found to be an important factor in their development as learners for nonmusic subjects as well. Specifically, music education has been shown to enhance language and vocabulary development, improve memory and problem solving skills, strengthen hand-eye coordination, and encourage teamwork (Silverstone, 2018). Music education also teaches students about proper study habits through concerted effort and consistent practice (Silverstone, 2018).

Music education involves more than just practicing scales. In fact, "a child learning about music has to tap into multiple skill sets, often simultaneously. For instance, people use their ears and eyes, as well as large and small muscles" (Brown, 2012). Research has also shown that music education helps children develop and improve their language skills, as well as fostering memorization skills and encouraging collaboration with others (Martin, 2020). In addition to these benefits, music has been found to be a factor in forming our identities during adolescence, which influences how we are perceived by others (Tarrant et al., 2002).

There are a number of reasons why someone might gravitate towards specific types of music, but one study found that adolescents primarily listened to music as a means of fulfilling emotional needs (Tarrant et al., 2002, p. 135). This includes emotional release and expression of emotions that are unique to everyone and may provide insight into our musical intelligence and how we perceive ourselves in relation to the music we listen to. Research has shown that how students perceive themselves and their abilities has an influence on their academic achievement, which in turn influences their self-concept (Hash, 2017).

2.3 The Role of Self-Concept in Academic Achievement

According to existing research, "achievement and self-concept are causes and effects of each other. As a result, an increase or decrease in one of these constructs will cause a similar change to the other within the same domain" (Hash, 2017, p. 205). This is one of the reasons why musicians are often so critical of their own work and "students in music education programs tend to review their teaching and playing using written or spoken self-reflections, so they might be more familiar with self-assessment and reflection" (Herb, 2022, p. 26). This self-assessment and reflection gives students the feedback they need to form their own self-concept.

Even though self-concept is not exclusive to music and may include a number of subjects a student is interested in, "it seems likely that satisfying musical experiences will help to enhance music self-concept and that, in turn, high music self-concept will encourage students to seek out enjoyable music-making experiences" (Sanders & Browne, 1998, p. 83). This heightened level of enjoyment in music could be a driving factor in the development of musical intelligence and give students a means of expressing themselves beyond just listening to music. Students may then create their own music to meet their emotional needs and express themselves in a way that may be more enjoyable to them than other artistic means.

2.4 Summary

Although music education is often overlooked and underfunded in public schools, there is still a need for students to engage with music at every academic level. Students in early grades may be mandated by state requirements to learn a musical instrument and stop as soon as it is no

longer required. Other students may continue to expand their musical intelligence to develop a better appreciation for music, as well as an understanding of themselves and their skill level. As a result, students with a higher self-concept and affective disposition toward music may be more likely to have higher scores in music.

3.0 METHODS

In order to explore the relationship between students' affective disposition and music scores, the National Assessment of Educational Progress (NAEP) Data Explorer was used to determine if the relationship between affective disposition and music scores is significant. This section will describe the NAEP Data Explorer, NAEP participants and sampling methods, which NAEP survey questions were used for this study, and how the data was used to determine the significance of the relationship between affective disposition and music scores.

3.1 Participants and Sampling

NAEP is congressionally mandated and overseen by the National Center for Education Statistics (NCES), part of the U.S. Department of Education and Institute of Education Sciences (NCES, 2022a). Known as The Nation's Report Card, the NAEP has helped improve educational policy since 1969 (NCES, 2022a). The data for this study was gathered using the NAEP Data Explorer and focused on the 2016 NAEP eighth-grade music assessment.

NAEP Sampling and Data Collection

NAEP uses a complex multistage sampling design that samples students from selected schools across the country (NCES, 2022b). During assessment cycles, "a sample of students in designated grades within both public and private schools throughout the United States (and sometimes specified territories and possessions) is selected for assessment" (NCES, 2022b). The most recent assessment for music was given in 2016 and included approximately 4,300 eighth grade students from around 260 public and private schools (NCES, 2020). As a result of budget constraints, the 2016 NAEP music assessment only assessed students' response process in music and did not assess students' ability to create or perform music (NCES, 2020).

Public School Selection in State Assessment Years

NCES compiles a comprehensive list of public schools operating in each jurisdiction, the Common Core of Data (CCD) file, and uses this list as a sampling frame for a selection of public schools (NCES, 2022b). This list also contains information about what grades are served at the school, as well as enrollment data and the location of each school (NCES, 2022b). Schools are then combined into groups based on various characteristics. "These characteristics include the physical location of the school, extent of minority enrollment, state-based achievement scores, and median income of the area in which the school is located" (NCES, 2022b). Grouping schools within these groups, or strata, is done to provide an ordered selection process to improve the reliability of the results (NCES, 2022b).

3.2 Data Analysis

The NAEP Data Explorer was used to analyze the eighth-grade public schools music scores for the year 2016. The NAEP Data Explorer is a web-based system that draws from a database of responses provided by students and schools to compute real-time statistics for every main NAEP assessment since 1990 (NCES, 2008). Cohen's d effect sizes were calculated using the University of Colorado Colorado Springs (UCCS) effect size calculator (Becker, 2000).

NAEP Data Explorer

The NAEP Data Explorer is able to provide tabular data, run tests, and generate charts or other visualization materials (NCES, 2008). The customizable tabular summaries can then be exported to other software tools, including statistical software, word-processors, spreadsheets, or presentation slides (NCES, 2008). For this study, descriptive tables were provided by the NAEP Data Explorer (NCES, 2022a). In some instances, the tables were formatted without altering the data inside the tables. Three coded survey questions were selected with each question having the option for agree, disagree, or not sure. These questions include:

1. How much do you agree with the following statements?

I think I have talent for music. (student-reported) ID: BM00003

2. How much do you agree with the following statements?

People tell me I am a good musician. (student-reported) ID: BM00004

3. How much do you agree with the following statements?

I like to play music for other people. (student-reported) ID: BM00005r

4.0 RESULTS

The NAEP Data Explorer does not provide the exact number of student-responses. This section will provide the average scale score and standard deviation for three variables related to affective disposition. Table 1 presents the NAEP eighth-grade music average scale score and standard deviation for national public schools during assessment year 2016. This average scale score represents 100% of the eighth-grade students on the 2016 NAEP music assessment. The average scale score was 146 on a scale of 0-300 with a standard deviation of 35.

Table 1

Average scale scores and standard deviations for grade 8 music, by all students [TOTAL] and jurisdiction: 2016

Year	Jurisdiction	All students	Average scale score	Standard deviation
2016	National public	All students	146	35

Note: Some apparent differences between estimates may not be statistically significant.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2016 Music Assessment.

RQ #1: Think I have talent for music [BM00003]

Table 2 presents the 2016 NAEP eighth-grade music average scale score and standard deviation for national public schools based on how students perceive their talent for music.

Table 2

Average scale scores and standard deviations for grade 8 music, by I have talent for music [BM00003] and jurisdiction: 2016

Year	Jurisdiction	Think I have talent for music	Average scale score	Standard deviation
2016	National public	Agree	162	36
		Not sure	144	33
		Disagree	134	30

Note: Some apparent differences between estimates may not be statistically significant.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2016 Music Assessment.

Table 3 presents the significance test results based on whether students' thought they had a talent for music. The difference in average scale scores were statistically significant ($p < .001$) for each of the pairs and are reported in detail below.

Table 3

Difference in average scale scores between variables, for I have talent for music [BM00003] National public, 2016

	Agree	Not sure	Disagree
Agree			
Not sure	<		
	Diff = -18		
	P-value = 0.0000		
	Family size = 3		

Disagree	<	<
	Diff = -28	Diff = -10
	P-value = 0.0000	P-value = 0.0000
	Family size = 3	Family size = 3

LEGEND:

<	Significantly lower.
>	Significantly higher.
x	No significant difference.

Note: Within jurisdiction comparisons on any given year are dependent with an alpha level of 0.05.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2016 Music Assessment

Students who agreed with the statement that they had a talent for music had an average scale score (M = 162; SD = 36) that was significantly ($p < .001$) higher than those who were not sure (M = 144; SD = 33) or disagreed (M = 134; SD = 30). Also, students who were not sure if they had a talent for music had an average scale score (M = 144; SD = 33) that was significantly ($p < .001$) higher than those who reported not having a talent for music (M = 134; SD = 30). The effect size for each significant mean difference was calculated and presented in Table 4.

Table 4
Effect sizes of significant mean score differences in self-reported talent for music

		Cohen's <i>d</i>
Agree	Disagree	0.85
Agree	Not Sure	0.52
Not Sure	Disagree	0.32

The effect size of the difference between average scale score for students who agreed that they had a talent for music and students who disagreed was $d = 0.85$ (Table 4). The effect size of the difference between average scale scores for students who agreed that they had a talent for music and students who were not sure was $d = 0.52$. The effect size of the difference between average scale scores for students who were not sure if they had a talent for music and students who thought they did not have a talent for music was $d = 0.32$. The effect sizes for this question were small (0.32), medium (0.52), and large (0.85).

RQ #2: People tell me I am a good musician [BM00004]

Table 5 presents the 2016 NAEP eighth-grade music average scale score and standard deviation for national public schools based on whether students agreed or disagreed that they had been told they were a good musician by other people.

Table 5

Average scale scores and standard deviations for grade 8 music, by people tell me I am a good musician [BM00004] and jurisdiction: 2016

Year	Jurisdiction	People tell me I am a good musician	Average scale score	Standard deviation
2016	National public	Agree	169	33
		Not sure	145	34
		Disagree	135	30

Note: Some apparent differences between estimates may not be statistically significant.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2016 Music Assessment.

Table 6 presents the significance test results based on whether students' reported that they have been told they are a good musician by other people. The difference in average scale scores were statistically significant ($p < .001$) for each pair and are reported in detail below.

Table 6

Difference in average scale scores between variables, for people tell me I am a good musician [BM00004] National public, 2016

	Agree	Not sure	Disagree
Agree			
Not sure	< Diff = -25 P-value = 0.0000 Family size = 3		
Disagree	< Diff = -35 P-value = 0.0000 Family size = 3	< Diff = -10 P-value = 0.0000 Family size = 3	

LEGEND:

< Significantly lower.

>	Significantly higher.
x	No significant difference.

Note: Within jurisdiction comparisons on any given year are dependent with an alpha level of 0.05.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2016 Music Assessment

Students who agreed that other people have said they are a good musician had an average scale score ($M = 169$; $SD = 33$) that was significantly ($p < .001$) higher than those who were not sure ($M = 145$; $SD = 34$) or disagreed ($M = 135$; $SD = 30$). Students who were not sure if other people had told them they were a good musician had an average scale score ($M = 145$; $SD = 34$) that was significantly ($p < .001$) higher than those who disagreed ($M = 135$; $SD = 30$). The effect size for each significant mean difference was calculated and presented in Table 7.

Table 7

Effect sizes of significant mean score differences for students who have been told they are good musicians by other people.

		Cohen's <i>d</i>
Agree	Disagree	1.08
Agree	Not Sure	0.72
Not Sure	Disagree	0.31

The effect size of the difference between average scale score for students who agreed that they have been told they are a good musician by other people and students who disagreed was $d = 1.08$ (Table 4). The effect size of the difference between average scale scores for students who agreed that they have been told they are a good musician by other people and students who were not sure was $d = 0.72$. The effect size of the difference between average scale scores for students who were not sure if they have been told they are a good musician by other people and students who disagreed was $d = 0.32$. The effect sizes for this question were small (0.31), medium (0.72), and large (1.08).

RQ #3: Like to play music for other people [BM00005]

Table 8 presents the 2016 NAEP eighth-grade music average scale score and standard deviation for national public schools based on whether students agreed or disagreed that they like to play music for other people.

Table 8

Average scale scores and standard deviations for grade 8 music, by like to play music for other people [BM00005] and jurisdiction: 2016

Year	Jurisdiction	Like to play music for other people	Average scale score	Standard deviation
2016	National public	Agree	160	38
		Not sure	150	35
		Disagree	139	31

Note: Some apparent differences between estimates may not be statistically significant.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2016 Music Assessment.

Table 9 presents the significance test results based on whether students' reported that they like to play music for other people. The difference in average scale scores were statistically significant ($p < .001$) for each of the pairs and are reported in detail below.

Table 9

Difference in average scale scores between variables, for like to play music for other people [BM00005] National public, 2016

	Agree	Not sure	Disagree
Agree			
Not sure	< Diff = -10 P-value = 0.0000 Family size = 3		
Disagree	< Diff = -21 P-value = 0.0000 Family size = 3	< Diff = -11 P-value = 0.0000 Family size = 3	

LEGEND:

- < Significantly lower.
- > Significantly higher.
- x No significant difference.

Note: Within jurisdiction comparisons on any given year are dependent with an alpha level of 0.05.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2016 Music Assessment

Students who agreed that they like to play music for other people had an average scale score ($M = 160$; $SD = 38$) that was significantly ($p < .001$) higher than those who were not sure ($M = 150$; $SD = 35$) or disagreed ($M = 139$; $SD = 31$). Additionally, students who were not sure if they like to play music for other people had an average scale score ($M = 150$; $SD = 35$) that was significantly ($p < .001$) higher than those who disagreed ($M = 139$; $SD = 31$). The effect size for each significant mean difference was calculated and presented in Table 10.

Table 10

Effect sizes of significant mean score differences for students who like to play music for other people

		Cohen's <i>d</i>
Agree	Disagree	0.61
Agree	Not Sure	0.27
Not Sure	Disagree	0.33

The effect size of the difference between average scale score for students who agreed that they like to play music for other people and students who disagreed was $d = 0.61$ (Table 4). The effect size of the difference between average scale scores for students who agreed that they like to play music for other people and students who were not sure was $d = 0.27$. The effect size of the difference between average scale scores for students who were not sure if they like to play music for other people and students who disagreed was $d = 0.33$. The effect sizes for two of the differences were small (0.27 and 0.33) while the third was medium (0.61).

5.0 DISCUSSION

The purpose of this research was to explore the relationship between students' affective disposition and their 2016 NAEP eighth-grade music scores. In this context, affective disposition specifically refers to the students' self-concept related to music and how they perceive their own talents regarding music. The 2016 NAEP music assessment did not measure students' ability to create or perform music, so this study was limited in scope to students' response process related to music. Additionally, it is important to consider that these survey items were self-reported by students who may not have responded honestly. Regardless, this study was primarily interested in exploring whether students with higher scores in music had a higher self-concept in music.

The 2016 NAEP music assessment was on a scale of 0-300 with a national average score of 146 with a standard deviation of 35. This low average could be an indication of students not

being engaged in music or a result of budget constraints either in music education or within the NAEP music assessment. This assessment did not measure students' ability to create or perform music, so students who are proficient at playing an instrument might have lower scores despite being a talented musician. Students with test anxiety may also have lower music scores simply because the music assessment was administered as a standardized test.

RQ #1: Think I have talent for music (student-reported)

Students who self-reported that they agreed with the statement "I think I have talent for music" had a higher average score than those who were not sure or who disagreed. This finding is consistent with prior research regarding music education improving study habits (Silverstone, 2018). Additionally, it supports research regarding the role of musical self-concept which has been found to benefit non-music majors (Herb, 2021; Sanders & Browne, 1998), and college students (Hash, 2017). However, these findings should be interpreted carefully.

This study did not aim to find whether a higher self-concept led to higher scores, or if higher scores led to higher self-concept. However, it is clear that the students who thought they had a talent for music had higher average scores than those who were not sure or did not think they had a talent for music. Students who agreed with this statement also had a higher average than the national average score, which may be from a lack of music education in many schools bringing the national average down for all students.

RQ #2: People tell me I am a good musician (student-reported)

Students who self-reported that they agreed with the statement "People tell me I am a good musician" had significantly higher scores than those who were not sure or who disagreed. This question in particular yielded the highest average score for the students who agreed, as well as the largest effect size between those who agreed and those who disagreed. This provides some interesting insight into how we form our own self-concept. Despite the term being of the self, our perception of ourselves is often skewed by the people around us.

As research has shown, music is a major factor in our identities and influences how we are perceived by others (Tarrant et al., 2002). How we perceive ourselves is often a reaction to how others treat us. Individuals may seek validation, or put more value in the opinion of others, to reinforce their own self-concept. Music especially encourages collaboration and teamwork by promoting social relationships between artists (Martin, 2020). These social relationships can go on to become long lasting friendships and have been found to help increase student engagement in schools where students participate in music education (Martin, 2020).

RQ #3: Like to play music for other people (student-reported)

Students who self-reported that they agreed with the statement "I like to play music for other people" also had higher average scores than those who were not sure or who disagreed. The findings here are similar to the previous research questions, with students who were not sure scoring slightly higher than the other questions. This question yielded the smallest effect sizes of the three research questions and the smallest difference between averages in each response. This could be a result of the wording of the question being ambiguous on what play means.

Students might respond differently depending on how the question is interpreted. In this context, play could mean to perform music for other people or it could mean to share music you enjoy with other people. Despite this possible confusion, the findings are still in line with the other findings that support the importance of music intelligence in various skills (Brown, 2012). Furthermore, this finding is consistent with research regarding socio-emotional awareness when making music with others (Musacchia & Khalil, 2020).

6.0 CONCLUSION

The purpose of this paper was to explore the relationship between students' affective disposition toward music and their 2016 NAEP music assessment scores. While it did not aim to determine whether higher scores lead to a more positive disposition, or whether a more positive disposition leads to higher scores, it did aim to explore the relationship between them to see if students who had a more positive disposition had significantly higher scores. As a result, three specific conclusions were drawn from the three research questions that were found using the NAEP Data Explorer regarding the 2016 NAEP music assessment.

6.1 Conclusions

First, students who agreed that they have a talent for music had higher average music scores than students who were not sure or disagreed. These students also had higher average music scores than the national average among all public schools, which was true for students who agreed to all three questions. Students with a higher self-concept in music scored higher on average than students who had a lower self-concept. This also could be a sign of the budget constraints that limit music education in national public schools. If a student does not have access to music education, it may be difficult for them to know if they have a talent for it.

Second, students who agreed that they were told by other people that they are good musicians had the highest average music scores among the three research questions. This question also had the largest effect size among the three questions. This suggests that students who receive external validation from others may be more likely to have a higher self-concept, or at least have higher scores. This could be particularly important in music where students may feel vulnerable sharing music with others out of fear of being criticized. Students are also less likely to hear they are a good musician if they do not participate in music education.

Finally, students who agreed that they enjoyed playing music for other people had higher average music scores than those who disagreed or were not sure. However, this question had the weakest effect size among the three research questions. This could be a result of confusion in the wording of the statement or simply that students enjoy playing music for themselves as much as they enjoy playing music for others. Therefore, playing music for others may not be as much of a factor for students pursuing music education, but it is still a sign of musical intelligence.

6.2 Implications

With these conclusions in mind, one implication is that our self-concept comes as a result of our belief in ourselves, as well as the validation of others. This validation is important in the arts because sharing original artwork can be a vulnerable feeling for people. This is not to say

that telling someone they are a good musician will make them a good artist, but this validation could inspire students to continue their efforts in music education when they may be struggling to believe in themselves. Ignoring the efforts of others, or outright telling someone they are bad at music, may cause them to lose interest altogether.

Another implication that arises from this study is the effect of budget constraints on both music education and music assessment. As stated earlier, music education is often the first to get cut from public schools as a result of budget constraints. As a result, most public school students do not participate in music education because of high instrument costs (Yamaha Staff, 2020). The 2016 NAEP assessment of music and visual arts also faced budget constraints that restricted the assessment from accurately measuring students' ability to create and perform music.

6.3 Limitations

This study was a secondary analysis of the 2016 NAEP eighth-grade music national dataset with several limitations. First, this study was intentionally limited in scope and did not include more years or grades in order to keep the dataset small. As a result, comparisons between years and grades were not available for this study. Further, this study only explored music scores and did not compare average music scores with other subjects, such as math, science, or reading. Additionally, this study explored the dataset provided for national public schools, so differences between states and private schools were not included. By exploring more assessment years, more grades, and more regional datasets, researchers may find more detailed trends or patterns.

6.4 Recommendations for Future Research

The NAEP Data Explorer offers more student factors that this study did not include, so further exploration could be done regarding the relationship between student factors and music scores. Future research could also focus on identifying whether students who have higher music scores also have higher scores in other subjects, such as mathematics and reading. Additionally, research regarding budget constraints in both music education and music assessment could offer insight into ways administrators and educators can make music education more accessible.

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