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Gender Association with Stringed Instruments: A Four-Decade Analysis of Texas All-State Orchestras

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The violin, viola, cello, and double bass have fluctuated in both their gender acceptability and association through the centuries. This can partially be attributed to the historical background of women's involvement in music. Both church and society rigidly enforced rules regarding women's participation in instrumental music performance during the Middle Ages and Renaissance. In the 1700s, Antonio Vivaldi established an all-female string orchestra and composed music for their performance. In the early 1800s, women were not allowed to perform in public and were severely limited in their musical training. Towards the end of the 19th century, it became more acceptable for women to study violin and cello, but they were forbidden to play in professional orchestras.

Societal beliefs and conventions regarding the female body and allure were an additional obstacle to women as orchestral musicians, due to trepidation about their physiological strength and the view that some instruments were "unsightly for women to play, either because their presence interferes with men's enjoyment of the female face or body, or because a playing position is judged to be indecorous" (Doubleday, 2008, p. 18). In Victorian England, female cellists were required to play in problematic "side-saddle" positions to prevent placing their instrument between opened legs (Cowling, 1983). The piano, harp, and guitar were deemed to be the only suitable feminine instruments in North America during the 19th Century in that they could be used to accompany ones singing and "required no facial exertions or body movements that interfered with the portrait of grace the lady musician was to emanate" (Tick, 1987, p. 327).

In the 1920s and 1930s women orchestras began to burgeon and in 1925 Ethel Leginska had her American premiere as a conductor of the all-male New York Symphony Orchestra (Macleod, 1993). Female composers and performers received support from various women's clubs and music clubs. Scholarship assistance was also available for women pursuing musical training. All-female orchestras were established to provide a venue for the women musicians, since they were denied membership in the male orchestras (Neul-Bates, 1982). With the exodus of so many male musicians during the onset of World War II, women were finally allowed to join established orchestras. However, it was 1997 before the Vienna Philharmonic Orchestra reluctantly accepted its first female into membership—a harpist (Doubleday, 2008).

In the 21st century, males and females in the US have equal access to any instrument, yet instrument gender associations still exist. What has prompted the assignment of instruments to a particular gender? Doubleday (2008) explains that, "an instrument's look or sound may come to embody gendered meaning. Instruments may be imaged or named as male or female entities, as paired entities combining male-female characteristics, or as gendered members of a family" (p. 29). The concept of instrumental families heralds back to Michael Praetorius, who made reference to the "violin family" in his treatise, *Syntagma Musicum* in 1619 (Boyden, 1984). *The New Grove Dictionary of Musical Instruments* contains a pictorial representation of "the violin family" utilizing a cello, a viola, and two violins made by Antonio Stradivari (Boyden, 1984). This concept of a family of instruments—large to small—conjures an image of the human family unit of father, mother, and babies, with the male automatically being associated with the largest instrument.

Society, parents, and peers may be responsible for perpetuating engrained gender stereotypes that influence instrument choice (Abeles, 2009; Abeles & Porter, 1978; Conway, 2000; Delzell & Leppla, 1992; Fortney, Boyle, & DeCarbo, 1993; Green, 1993; Griswold & Chroback, 1981; Lueptow, Garovich-Szabo, and Lueptow, 2001; Sinsabaugh, 2005). Studies indicate that a student's formation of gender association with an instrument can be impacted by role models, a supportive environment, and the method in which instruments are demonstrated (Abeles & Porter, 1978; Bruce & Kemp, 1993; Buttu, 2008; Conway, 2000). Teachers can play a key role in helping students set aside gender stereotypes when choosing an instrument (Bayley, 2000; Brophy, 1985; Conway, 2000; Fortney et al, 1993; Green, 1993; Johnson & Stewart, 2004, 2005; Sinsabaugh, 2005).

Research supports the notion that females are more likely to cross gender lines in a band setting than males (Abeles, 2009; Conway, 2000; Delzell & Leppla, 1992; Zervoudakes & Tanner, 1994). Buttu's study (2008) of a single-sex school reveals that, although female students were aware that gender stereotypes existed, they felt freedom to break social convention and select low brass and percussion instruments (traditionally played by males) due to a safe and supportive environment. Their peers regaled them as being "courageous" and described them as having "an unwavering sense of confidence and pride for their instrument" (Buttu, 2008, p. 31).

Further, students indicated that they believed it was easier for females to cross social barriers in instrument selection because they were viewed as "pioneers" and "forward thinking," whereas males playing a "feminine" instrument ran the risk of being ridiculed, bullied, and committing "social suicide" (Buttu, 2008, p. 32). Sinsabaugh's study (2005) supports the contention that males face greater challenges crossing gender barriers in instrumental selection, naming the flute as being the most controversial, due to concerns about teasing by peers. Other research reinforces the perception that males are more subject to social pressure surrounding instrument gender stereotypes (Cramer, Million, & Perrault, 2002; Delzell & Leppla, 1992; Harrison, 2003). Green (2002) examined secondary music teachers' and students' views of gender musical practices, abilities, and inclinations. Teachers stated that girls far outnumbered boys in participating in classical music and playing classical instruments, such as violin, flute, and piano. Students underscored their teachers' view, stating that girls were most likely to play the violin and cello and perform slow, classical music. Green (2002) summarizes gender association with music as follows:

> For a boy to engage in vocal or orchestral music, "slow" music, or music that is associated with the classical style in school, involves taking a risk with his symbolic masculinity. If these activities provide a suitable mantle for girls, then they are for boys rather like putting on a dress. Just as girls negotiate a feminine gender identity through

> music, so boys negotiate a masculine gender identity; and they are often under a great deal of pressure to appear "macho." (p. 5)

Peer pressure has been shown to be the primary factor in influencing students' choice of instruments (Bayley, 2000; Bazan, 2005).

While the majority of studies have addressed gender stereotypes among band instruments, a few studies have included string instruments. Harrison's study (2003) determined that females are more inclined to play strings or woodwinds than males. Hassinger (1989), in her investigation of US jazz history, found that strings and flute were fixed firmly in the female domain. In their study of stereotypes among high school musicians, Builione and Lipton (1983) discovered that their peers labeled strings and woodwind players as being "intelligent," "feminine," and "introverted." Musicians in professional orchestras ranked the strings section as being significantly different from the other three sections in terms of being more introverted, not enjoying alcohol, having an inactive sense of humor, being nonathletic, and being insensitive. String players described themselves as "sensitive," "competitive," "neurotic," and "insecure," while other sections used descriptors including "weird," "boring," "quiet," and "feminine" (Lipton, 1987, p. 89). A study conducted by Abeles and Porter (1978) revealed that the violin was labeled as being feminine, along with the flute and clarinet, whereas the cello and saxophone were considered gender neutral. In 1981, Griswold and Chroback conducted an instrument gender association study, using a variety of instruments, and found that both the cello and double bass were rated as masculine. Abeles's study (2009) of current trends in gender instrument association showed that violin and cello were predominantly played by females. However, he added that among the 20% of males crossing instrument gender lines, more than one-half of them played the violin.

Individuals have various reasons for choosing to play an instrument that is traditionally assigned to the opposite sex. Doubleday (2008) suggested that it could be a result of artistic motivation or the desire to experiment, change cultural mores, astonish, or draw attention. She added that regardless of the reason, "such an act has a social impact, since it sets an example that others may follow" (p. 26). Sinsabaugh (2005) found that students who crossed gender lines in instrument choice received strong parental support, were encouraged by their elementary teachers, desired to establish a distinctive identity, and were unaffected by peers' negative comments. Green (2002) pointed out that "it is a vital aspect of the symbolic power of music, that it enables girls and boys to *cross over*…gender divides. Most particularly when pupils are regarded as exceptionally "talented" do such cross-overs occur" (p. 9).

Whatever the motivation, instrumental choice is critical to a student's success in performance and longevity as a musician. When students are allowed to freely select the instrument they like or with which they can most closely identify, they will be more motivated to practice, more likely to continue playing, and will be more inspired to strive for excellence in performance (Rife, Shnek, Lauby, & Lapidus, 2001).

The purpose of this study was to track the gender makeup of the five string sections (Violin 1, Violin 2, Viola, Cello, and String Bass) of Texas Music Educators Association (TMEA) All-State Orchestras from 1971 to 2010, to determine if a clear gender stereotype was evident in any of the sections and if there had been a trend towards a change in gender and instrument association over the past four decades.

Method

Data were extracted from the "All-State History Rosters" located on the Texas Music Educators Association website (www.tmea.org). The highest-ranking players in each section were members of the Symphonic Orchestra and the next highest tier played in the Philharmonic Orchestra (originally called the Youth Orchestra). A third-tier orchestra, the String Orchestra, was added in 1999. The list of All-State members was sorted by instrument, ensemble, and year, and then students were categorized by gender based on their names. Androgynous names were omitted. Results were tabulated in percentages and displayed in bar graphs, grouped by decades.

Results

Memberships in each of the Violin 1, Violin 2, and Viola sections are presented below as average percentage of participation per gender across the first three decades of data (1971-2000). Data for 2001-2010, during which majority shifts in these specific sections often occurred, are described separately. Population trends differed for Cello and String Bass sections; data is therefore presented by decade to better illuminate changes from one decade to the next.

Females dominated male populations in the Violin 1 section in two orchestras from 1971 to 2000, making up 65% of membership in the Symphony Orchestra (see Figure 1) and 61% in the Philharmonic Orchestra across 3 decades (see Figure 2). In the last decade, 2001 – 2010, males held the majority of the positions (51%) in the Violin 1 section of both All-State full orchestras. In the Violin 2 section, the female majority was consistent during each of the three decades, 1971 – 2000, averaging 63% in the Symphony Orchestra (see Figure 3) and 67% in the Philharmonic Orchestra (see Figure 4). In 2001-2010 males dominated the Violin 2 section of the Symphony Orchestra (56%) and gained a higher percentage of positions in the Philharmonic Orchestra (45% compared to 33% the previous three decades).

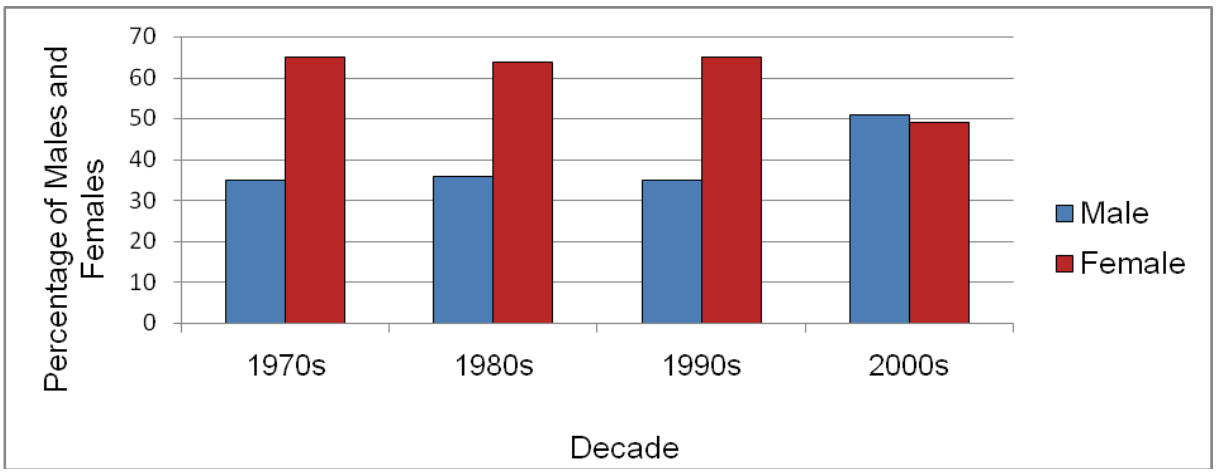

Figure 1. Violin 1 – All-State Symphony Orchestra – 1972 – 2010 by gender.

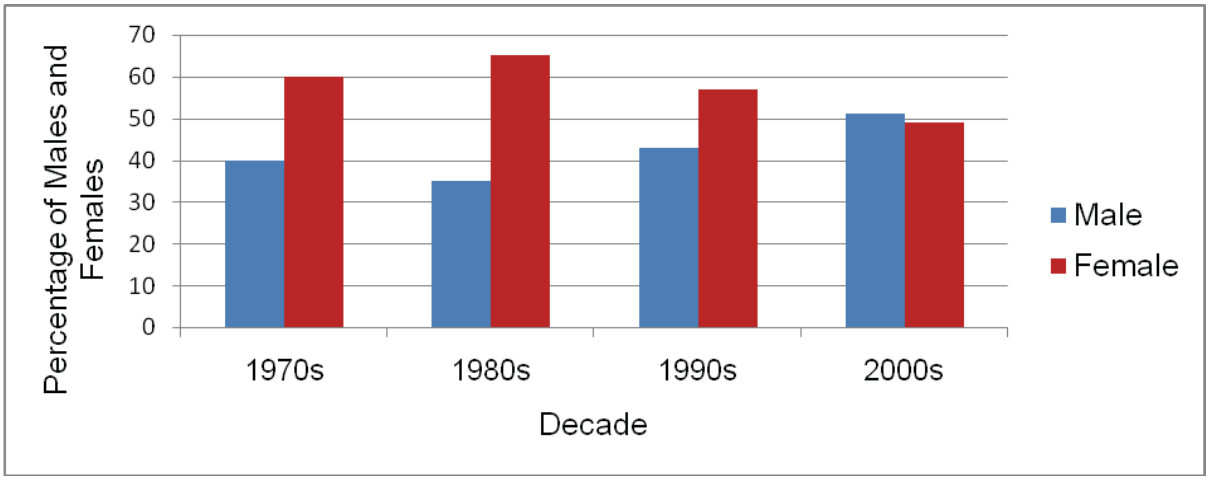

Figure 2. Violin 1 – All-State Youth/Philharmonic Orchestra – 1971 – 2010 by gender.

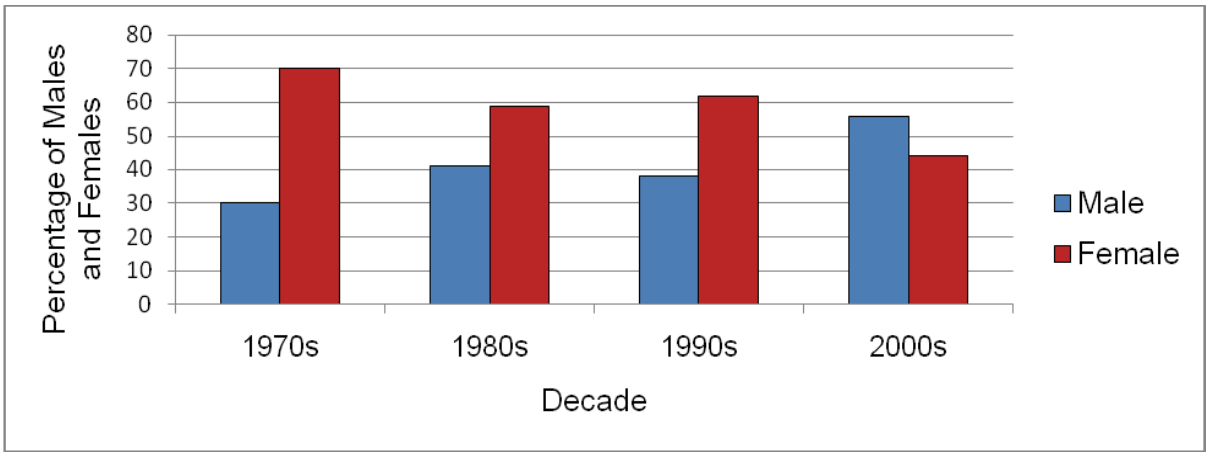

Figure 3. Violin 2 – All-State Symphony Orchestra – 1972 – 2010 by gender.

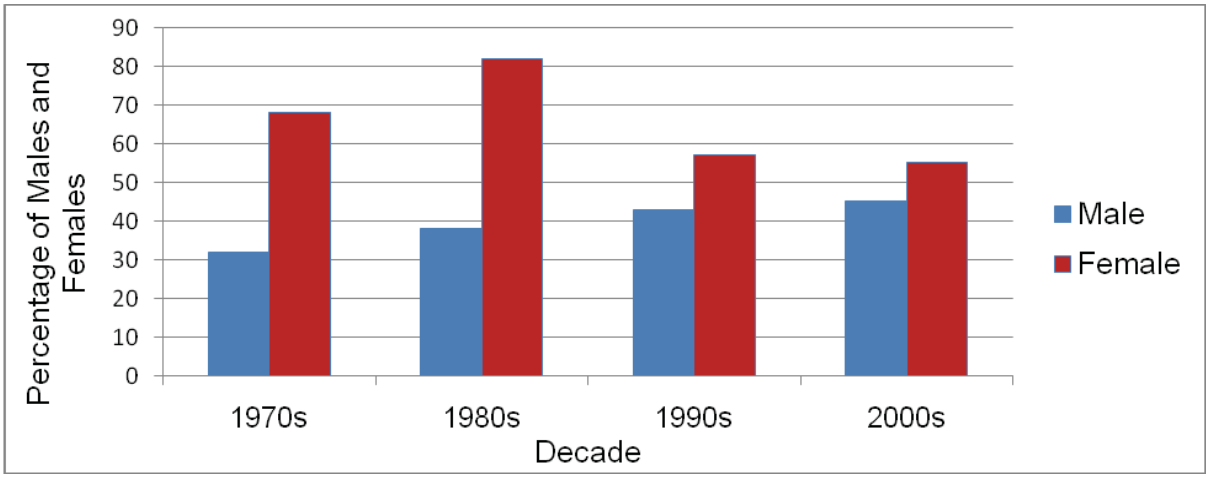

Figure 4. Violin 2 – All-State Youth/Philharmonic Orchestra – 1971 – 2010 by gender.

During the period from 1971 to 2000, female violists held the majority of seats in the Symphony Orchestra (see Figure 5), averaging 58%, as well as in the Philharmonic Orchestra (68%) across three decades (see Figure 6). Most recently, between 2001 and 2010, males acquired a 51% majority among violists in the Symphony Orchestra, and showed a marked increase in participation in Philharmonic Orchestra, with membership at 49% compared to an average of 32% in the previous three decades.

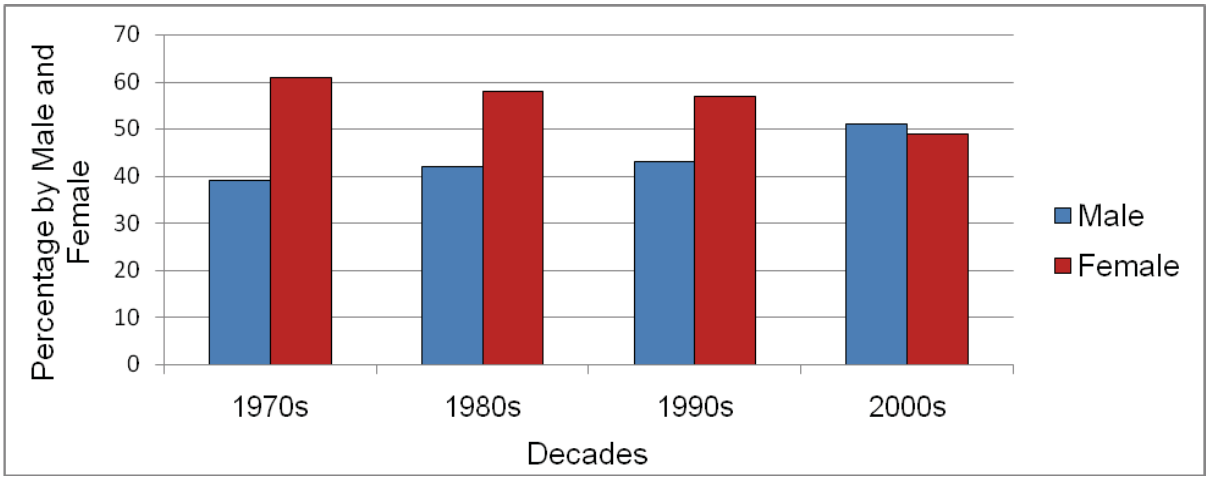

Figure 5. Viola – All-State Symphony Orchestra – 1972 – 2010 by gender.

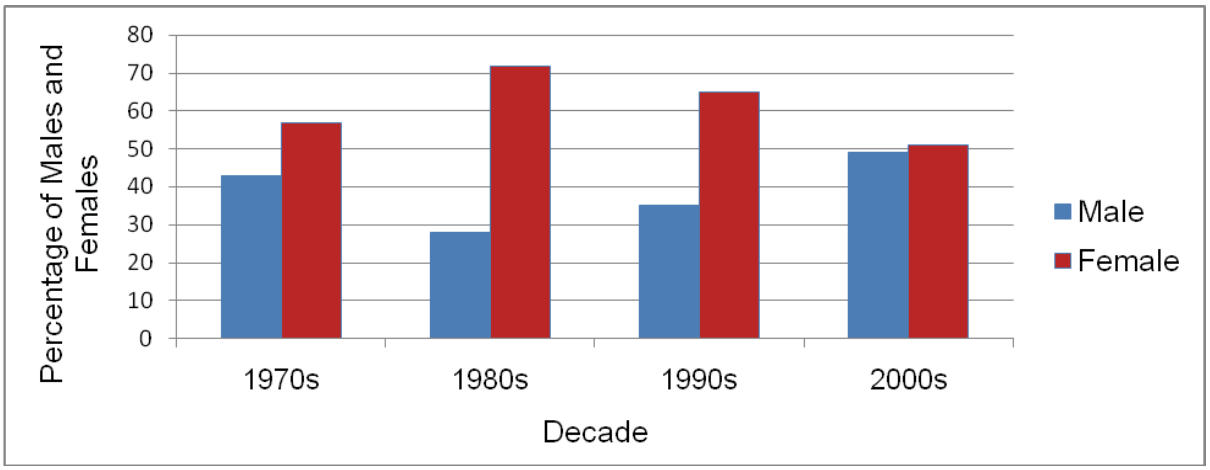

Figure 6. Viola – All-State Youth/Philharmonic Orchestra – 1971 – 2010 by gender.

The Cello section of the Symphony Orchestra (see Figure 7) began with a clear male domination in the 1970s (61%). In the 1980s there was a 50-50 split between the two genders; in the 1990s, females gained the majority (57%); and in the last decade those percentages reversed, with males holding the 57% majority. Likewise, the majority (51%) of cellists in the Philharmonic Orchestra (see Figure 8) in the 1970s were male. Females gained a 55% majority in the 1980s and 1990s, but from 2001 to 2010, membership between males and females was almost split in the section with males averaging 49% of the population.

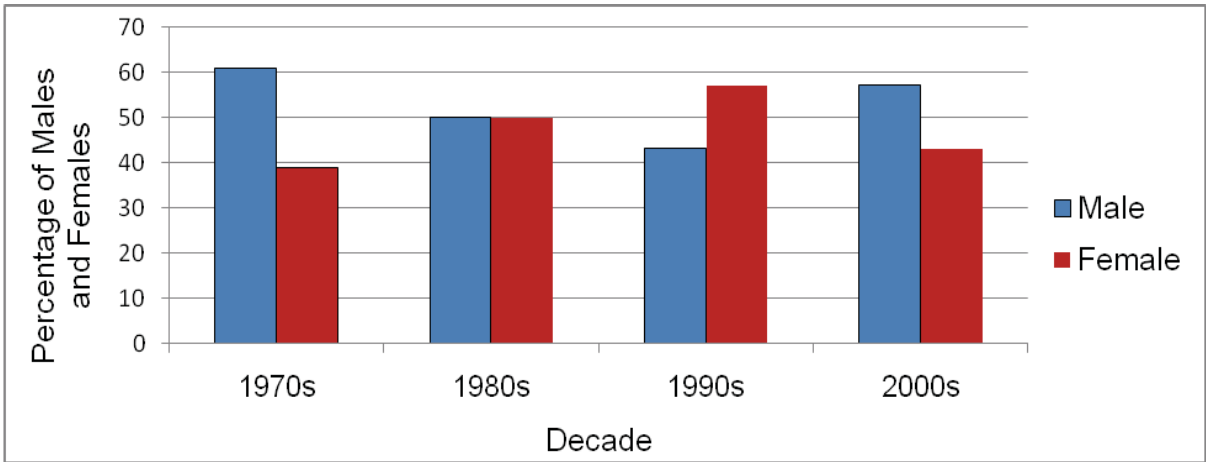

Figure 7. Cello – All-State Symphony Orchestra – 1972 – 2010 by gender.

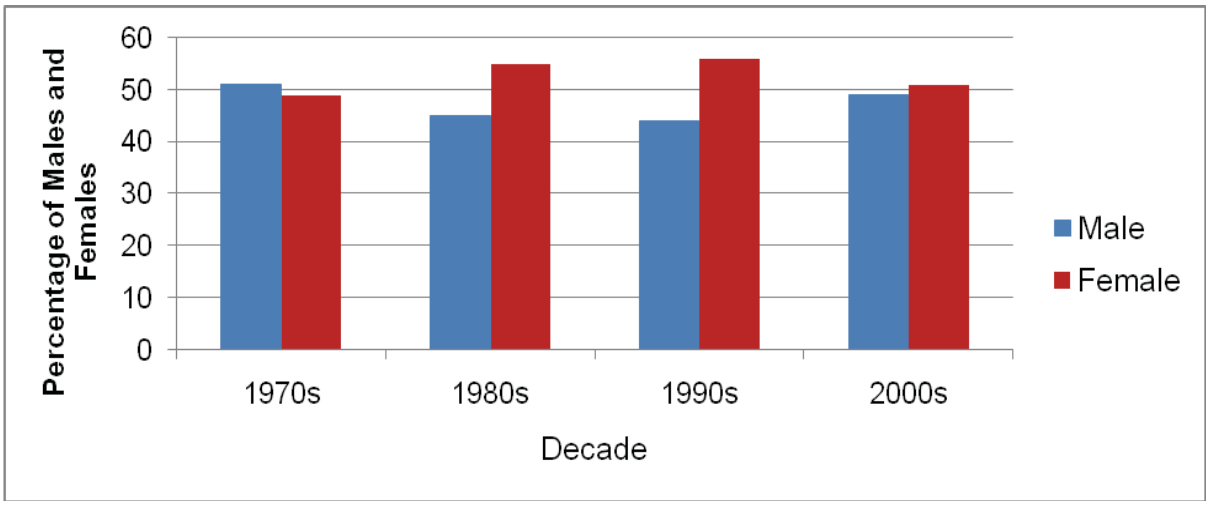

Figure 8. Cello – All-State Youth/Philharmonic Orchestra – 1971 – 2010 by gender.

In the String Bass section of the Symphony Orchestra (see Figure 9), females reached their highest percentage of membership (22%) in the 1970s. During the next three decades the percentage of female string bass players declined to an average of 12%. A higher percentage of female string bass players held membership in the Philharmonic Orchestra (see Figure 10), averaging 29% in the 1970s, 21% in the 1980s and 1990s, then rising slightly to 24% in the last decade.

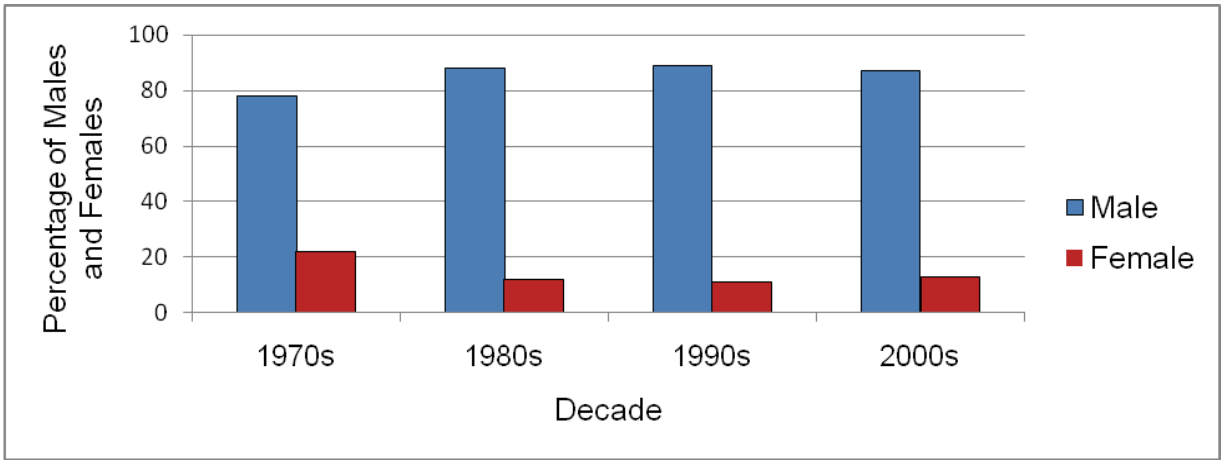

Figure 9. String Bass – All-State Symphony Orchestra – 1972 – 2010 by gender.

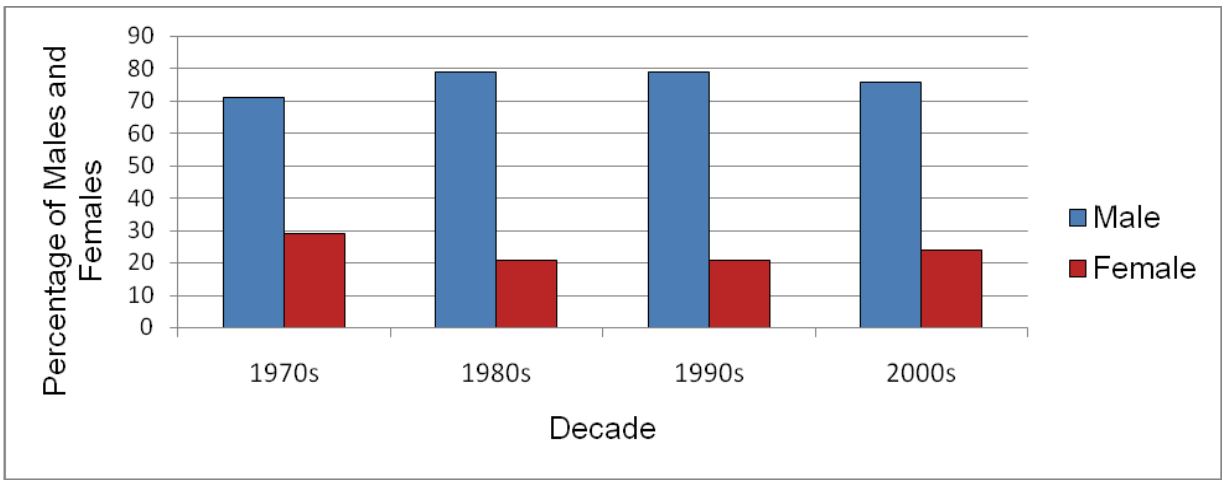

Figure 10. String Bass – All-State Youth/Philharmonic Orchestra – 1971 – 2010 by gender.

Data from the third-tier All-State String Orchestra (see Figure 11) was available from 1999 to 2010. Gender distribution for each instrument for that same period was extracted from the top two All-State orchestras as a basis of comparison. Females held the highest percentage of membership in both the Violin 1 (57%) and Violin 2 (54%) sections of the String Orchestra, whereas males dominated those sections in the Symphony Orchestra (Violin 1 – 51%; Violin 2 – 56%). While males had a 51% majority in the Violin 2 section of the Philharmonic Orchestra, the Violin 2 section was 54% female, which was identical to membership in the String Orchestra. The gender makeup of the viola section was almost identical in all three groups: Symphony Orchestra (51% male), Philharmonic Orchestra (51% female), and String Orchestra (50%). Male cellists had an almost identical percentage in the Symphony Orchestra (57%) and String Orchestra (56%), but numbered less than half (49%) in the Philharmonic Orchestra. Male string bass players held a significant majority in all three orchestras—87% in the Symphony Orchestra; and 76% in both the Philharmonic Orchestra and String Orchestra.

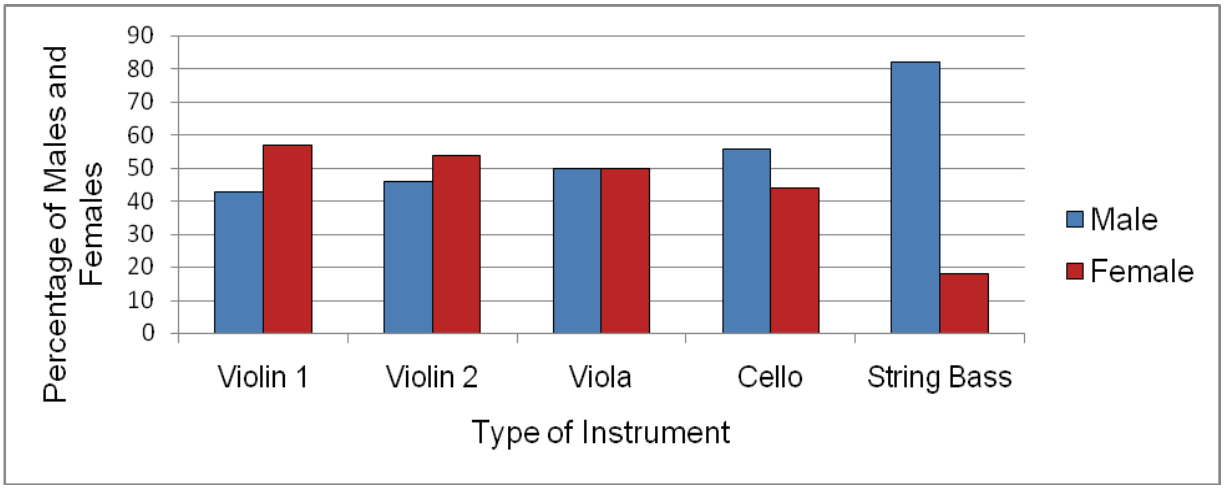

Figure 11. All-State String Orchestra – 1999 – 2010 by instrument and gender.

Discussion

This study indicates that gender and instrument association has changed in some sections but has remained consistent across the past four decades in others. The Violin 1 section demonstrates the greatest amount of change, moving from a clear female majority for a span of three decades before shifting to a male majority since 2001. Likewise, there has been an increase in the percentage of male Violin 2 members over the last decade, claiming a 56% majority in the Symphony Orchestra. While past research concurs that the violin has a "feminine" designation, a recent study conducted by Abeles (2009) pointed out that over half of the males that had crossed gender lines in instrument selection were playing violin.

While females dominated the viola section during the first three decades, the majority has shifted to males since 2001. This seems to follow the same pattern of an increase in male violin players. Although the research studies did not specifically address the viola, one would assume it would have a stronger feminine association since it is considered the "alto" voice of the violin family. Perhaps males no longer view the viola as being as feminine as they have in the past.

The cello has shifted from being male-dominated in the 1970s to being female-centered in the 1980s and 1990s, with a return to being male-dominated this past decade. A similar inconsistency in gender association of the cello is evident in research studies in that it was first deemed gender neutral (Abeles and Porter, 1978), then considered masculine (Griswold and Chroback, 1981), and most recently shown to be perceived as a feminine instrument (Abeles, 2009).

The percentage of female string bass players was at its height in the 1970s, declined in the 1980s and 1990s, but has begun to raise slightly this past decade. However, males have consistently made up three-fourths of the string bass section. This male domination is supported by research positing that the bass is considered a masculine instrument (Griswold and Chroback, 1981) or the "father" of the violin family (Boyden, 1984). While strides have been made to diffuse gender stereotypes among the other instruments in the string family, the bass seems to be

irretrievably linked with males. This phenomenon can partially be attributed to the physical characteristics required to play such a large instrument.

These data signify trends among the most gifted string players in the state of Texas and may not be representative of the general student population. It is assumed that earning a seat in a Texas All-State Orchestra requires a high level of musical talent and skill, as well as motivation, discipline, and a strong work ethic. Further, it is important to note that, according to Green (2002), students who possess exceptional music talent are more likely to cross gender lines. These young musicians not only set the standard for a high level of musical performance, but their willingness to play instruments outside of their gender designation may encourage their peers to follow their example (Doubleday, 2008).

Because this study has a limited demographic, it would be beneficial to examine the gender-instrument relationship among All-State orchestras and the general population of string players in other states to determine if the trends noted in this study are consistent in string programs across the US. Results of this investigation provide pre-service and in-service music educators with data demonstrating the trends towards students in orchestra program successfully crossing gender lines in instrument selection, and hopefully diminishing the role gender bias plays in instrumental selection.

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Differences in Music Performance Anxiety Levels between Underclassmen and Upperclassmen Music Education Undergraduates

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Research has documented that music performance anxiety is an issue that can affect musicians at all levels (Dews & Williams, 1989; Hamann, 1982; Hamann & Sobaje, 1983; Kirchner, 2003; Kokotsaki & Davidson, 2003; Osborne & Kenny, 2008; Ryan, 2004). In particular, the effect of music performance anxiety on the quality of performance and the mental well-being of performers has been well documented (Clark & Agras, 1991; Kirchner, 2003; LeBlanc, Jin, Obert, & Siivola, 1997), and musicians at even the highest levels continue to suffer from issues related to it. Performers who suffered from music performance anxiety noted that they were often consumed with feelings of apprehension, poor self-esteem, and despondency (Kirchner, 2003).

Researchers generally divide anxiety into two types: state and trait (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Spielberger et al. defined state anxiety as anxiety experienced in a particular situation, or a "palpable reaction or process taking place at a given time and level of intensity" (1983, p. 5). Trait anxiety, conversely, refers to "differences between people in the tendency to perceive stressful situations as dangerous or threatening and to respond to such situations with elevations in the intensity of their state anxiety reactions" (1983, p. 5). Subjects can have differing levels of state and trait anxiety. An example of high state anxiety can include being nervous before a performance or test, while high trait anxiety could manifest itself as someone who worries more than the average person, or who tends to be anxious in all situations, not just those where high stress is involved. Spielberger et al. developed the State-Trait Anxiety Inventory as a standardized instrument to measure levels of both of these types of anxiety. Many studies (Abel & Larkin, 1990; Cox & Kenardy, 1993; Hamann, 1982; Hamann & Sobaje, 1983; Kendrick, Craig, Lawson, & Davidson, 1982; Kokotsaki & Davidson, 2003; Nagel, Himle, & Papsdorf, 1989; Ryan, 2004; Zinn, McCain, & Zinn, 2000) have utilized this instrument as a primary method of measuring self –reported anxiety.

Through the State-Trait Anxiety Inventory and other measures, a variety of factors that can contribute to music performance anxiety have been established. In many studies, performance anxiety has been found to have differing effects on performances of musicians of different genders (Abel & Larkin, 1990; Kokotsaki & Davidson, 2003; Osborne & Kenny, 2008; Rae & McCambridge, 2004; Ryan, 2004). Ryan (2004) noted that male and female piano students

reacted differently to high-stress performance situations. Utilizing heart rate monitors and behavioral observation, the study found that female students reached a higher heart rate before playing, while male heart rates were highest while performing. In addition, male students displayed anxious behaviors including movement of the arms, hands, feet, and legs, significantly more frequently than did females. Whereas Ryan (2004) measured physiological characteristics, Kotosaki and Davidson (2003) noted that college-aged senior females were more likely to report anxiety than were males when given the State-Trait Anxiety Inventory. The authors suggested this might be due to a greater willingness among females to self-report anxiety than males. Rae and McCambridge (2004) had similar findings among secondary-level music students, with females having higher levels of self-reported music performance anxiety compared to their male peers. As Abel and Larkin (1990) found, it may be that in high-anxiety situations, females tend to report greater subjective anxiety, while males tend to exhibit greater physiological responses.

Many studies have found that years of experience or performance level had little or no correlation to the amount of music performance anxiety experienced by a performer (Cox & Kenardy, 1993; Kirchner, 2003; Rae & McCambridge, 2004). Kirchner (2003), in particular, found that piano professors who gave multiple recitals suffered from the same physiological and psychological effects, as did many undergraduates. Conversely, Hamann's (1982) study of undergraduate and graduate music students found that while performers with a greater number of years of formal study may perform better in increased anxiety conditions, increases in performance anxiety were more commonly linked to self-reported high trait anxiety.

Research looking specifically at the performance anxiety levels of undergraduate music education majors is sparse. In one of the few studies that examined this issue, Conway, Eros, Pellegrino, and West (2010) found that the different emphases placed on music education majors made for a wider array of activities and foci. Undergraduates who focus primarily in performance generally are concerned with ensembles and practicing, while music education undergraduates have many of the similar tasks combined with the pressure to go into schools and teach as early as possible. Students in the study noted tension they experienced between practicing and educational aspects of their degrees. Additionally, music education undergraduates perceived themselves as having a different identity from performance students, due to their additional tasks (Isbell, 2006). Performance anxiety could affect music education majors differently due to this difference; this study intends to begin to look at this population. Therefore, the primary purpose of this study is to determine whether there are differences in self-reported levels of music performance anxiety between under- and upper-classmen music education undergraduate students.

Method

The participants were music education majors enrolled in four sections of a required woodwinds methodology course at a large university in Texas. Participants included 32 underclassmen (12 males and 20 females) and 24 upperclassmen (11 males and 13 females). Underclassmen were students in their first two years of undergraduate university study; upperclassmen were all other students.

Students self-assessed their performance anxiety by answering questions on a researcher-designed assessment tool, the Performance Anxiety Inventory (PAI). The instrument was based on the standardized State-Trait Anxiety Inventory (STAI), developed to measure self-reported levels of anxiety (Spielberger et al., 1983). The STAI measures two types of anxiety: state

(anxiety in a particular situation) and trait (general anxiety). The complete inventory contains two halves, each with 20 items using 4-point Likert-type scales.

The adapted Performance Anxiety Inventory contains 73 items using a 5-point Likert-type scale with response options that range from "Never" to "Always." The inventory begins with: "During a solo musical performance, in front of an audience of social and professional peers, I feel…" The items on the inventory include both positive and negative reactions and feelings that may exist during performances. Items on the inventory are divided into two groups: 47 statements regarding psychological effects of performance anxiety and 26 items regarding physiological effects. The possible score range of the instrument is from 73 to 365, with a higher score indicating a greater degree of self-reported music performance anxiety. Participants were given 20 minutes to complete the questionnaire at the end their class period. The researcher read the recruitment statement before distributing informed consent forms to those who chose to participate in the study.

Items for the inventory were checked for content validity by a panel of experts, which included an undergraduate music major, a doctoral performance major, and a music professor. A field test was conducted to check for clarity using three undergraduate music majors, including a vocal music education major, an instrumental music education major, and an instrumental performance major. The questionnaire was pilot tested with another section of the woodwinds methods course from which the population was drawn. Internal consistency for the inventory was deemed sufficient (Cronbach's alpha = .952).

Normality of the data was assessed through observation of the skewness and kurtosis values of the dependent variable (performance anxiety) for each level of the independent variable (undergraduate level of study) as well as the observation of the relevant histograms. No value exceeded one; therefore, the data were assumed to be normal. Homogeneity of variance was found to be violated (p = .003); therefore, an independent samples Student's t-test with equal variances not assumed was used.

Descriptive statistics, including ranges, means, and standard deviations were calculated for each level of the independent variable. Undergraduate level of study was determined through demographic self-responses from the participants. An independent samples Student's t-test with equal variances not assumed was calculated to compare underclassmen and upperclassmen means on the Performance Anxiety Inventory. An alpha level of .05 with a non-directional hypothesis was established for the analysis.

Results

A wider range of scores was reported for underclassmen (ranging from 114 to 267) than for upperclassmen (ranging from 153 to 224). While underclassmen performance anxiety scores (M = 180.594, SD = 40.331) were lower than were those of upperclassmen (M = 184.542, SD = 21.053), an independent samples Student's t-test with equal variances not assumed found no statistically significant difference between the means t (48.915) = -.474, p = .637, d = .123. The calculated effect size indicates no practical effect, according to Cohen's suggested cut-off of .2 for a small effect (Cohen, 1988). In addition, the 95% confidence interval of -20.677 and 12.782 captures zero, indicating that the result is not statistically significant from the null hypothesis (mean difference = 0), and therefore, the null hypothesis was not rejected.

Discussion

This study was conducted to determine whether there was a difference in self-reported music performance anxiety between underclassmen and upperclassmen level undergraduate music education majors. Subjects were given the Performance Anxiety Inventory (PAI), a researcher developed instrument that had been pilot tested on a similar population prior to the study. The lack of statistical significance and small effect size indicated that there was no difference between the groups, and therefore, the null hypothesis was not rejected.

The lack of difference between the means of the groups is consistent with previous literature that has shown increased experience level does not correlate with a decrease of performance anxiety (Cox & Kenardy, 1993; Kirchner, 2003; Rae & McCambridge, 2004). Cox and Kenardy (1993) noted that performance anxiety was no different for students with fewer years of study than for those with more experience. This supports the conclusion that the music education undergraduate population is similar to others previously examined in the literature. Although music education majors often have different perceptions of their own identity as musicians, as noted by Isbell (2006), this current study suggests that they may be similar to the general population of musicians in terms of music performance anxiety research.

There are certain variables that may have been unaccounted for in this study. Because this study measured only self-reported performance anxiety, subjects could misestimate their own levels of anxiety. As Abel and Larkin (1990) noted, females tend to self-report higher levels of anxiety, while males tend to exhibit greater physical symptoms of anxiety. Therefore, the results within each group could differ based on having unequal numbers of each gender within each group (underclassmen and upperclassmen). Additionally, the researcher-developed Performance Anxiety Inventory asked the subjects to visualize themselves in a solo performance situation, as opposed to giving the test during that type of situation, as is common with the State portion of the State-Trait Anxiety Inventory. Subjects could misestimate their recollections of music performance anxiety. The instrument could be modified and pilot tested again to see if it is as reliable in those types of situations.

Music performance anxiety can affect musicians at all levels. Previous research studies have tended to document that years of experience do not affect self-reported and physical measures of music performance anxiety. This study supports previous research while tentatively extending those generalizations to music education undergraduates, as opposed to a general musician population. Further research is necessary to examine music education undergraduates and their relationship with music performance anxiety. Due to their multifaceted identities, studies looking at relationships between music performance anxiety and speech anxiety among music education undergraduates would be useful in determining whether general anxiety exists across all aspects of music educators.

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A Pilot Study: The Effect of Singing and Non-Singing — Instructional Strategies on Harmonic Listening Skills

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A shared understanding among many music educators is that the ability to sing musical structures (scales, intervals, chords) informs the ability to sight sing and to take dictation. To date, however, there is little or no research that systematically investigates whether or not singing experiences help students to acquire harmonic listening skills. Chittum (1969) observed that one can rarely recognize what one cannot produce. By extension, Chittum hypothesized that reproducing harmonies with one's voice—by singing chord arpeggios—prepares one to take harmonic dictation: students who learn to sing chord arpeggios develop more easily the ability to take harmonic dictation. Chittum asserted that students should only begin to engage in written harmonic dictation after they are successful in reproducing arpeggios with their own voices.

Furthermore, Chittum suggested that the most common method of harmonic dictation taught in many colleges and universities is not harmonic dictation, but rather, melodic dictation of the bass and soprano lines followed by analysis to determine a chord's identity. Karpinski referred to this method as *harmonic looking*, rather than *harmonic listening* (Karpinski, 2000, p. 118). Chittum asserted that most theory professors know that this methodology—parallel melodic dictation of the outer voices—is ineffective, but hypothesized that this approach persists because the prior musical experiences of most students is of performing a single-line instrument, such as a clarinet, rather than a chordal instrument like the piano. However, Chittum provided no empirical data to support his hypothesis about the relationship between singing and harmonic listening skills.

Informed by research in the areas of music psychology and cognition, music education, music theory and music perception, Karpinski's *Aural Skills Acquisition* (2000) contained effective advice on how to advance one's abilities in many of the tasks associated with aural skills. One stark exception is harmonic dictation. Rather than providing proven pedagogical methodologies, as he does for other aural skills, Karpinski critiqued common methodologies; he highlighted weaknesses without endorsing one approach more than another, or providing a viable alternative (Karpinski, 2000, pp. 117-127). Much of the discussion about harmonic dictation falls into the category of thinking *about* music, instead of thinking *in* music, which contradicts Karpinski's goal that "[t]he book is about thinking *in* music" (Karpinski, 2000, p. 4).

Karpinski evaluated singing chord arpeggios, as recommend by Chittum, as being "tedious and detail-oriented," in part, because each chord must be learned in multiple inversions (Karpinski, 2000, p. 119). Even though Karpinski included a research study by Manuel Alvarez (1980) in his reference list, Karpinski did not review Alvarez's method of identifying harmonies via a scalar technique, for which listening focuses on hearing $\hat{1}$ or $\hat{7}$ within a harmony as the first step to identifying an entire chord. Working with 72 seventh and eighth grades, Alvarez taught the scalar technique to some and a more traditional approach of identifying root movement between harmonies to others.

Alvarez's experiments (1980) investigated three basic questions:

1. Is a scalar or root harmonic aural perception technique more effective in teaching seventh and eighth-grade general music students to identify primary harmonic functions?
2. Are differences between the effects of instruction associated with tonal aptitude levels?
3. Do methods of instruction affect performances on different criterion measures of primary harmonic functions?

Alvarez found that students who learned the scalar technique performed better in all four areas tested: tonal aptitude, tonal inaptitude, the root test, and the root/inversion test.

Even though Alvarez's research did not mention singing as a methodology to acquire harmonic listening skills, it did endorse the scalar method as an effective pedagogical approach to develop harmonic listening skills—a pedagogical approach more successful than the commonly taught root technique that directs listening to the bass line. This allowed Alvarez to deduce that what makes sense with respect to knowledge of music theory does not translate to the skills of aural perception. The purpose of this investigation is to examine the effects of singing and non-singing experiences when students develop harmonic listening skills.

Method

Participants were children and adolescents who participate in a community youth choir (*N*=21). Ages ranged from 9-16 years. The subjects were organized into four separate groups. All subjects attended four consecutive days of classes and each class was 45 minutes in duration. All data were collected during the summer months of July and

August 2012. All of the students who participated in the community choir had previous experience with solfége syllables and hand signs; thereby, the instructor of the study used solfége and hand signs as pedagogical tools. Though the curriculum for all four groups was identical, two were designated as singing groups and two as non-singing. With the singing groups, the instructor modeled singing solfége, and led subjects to sing. Subjects in the non-singing groups received only spoken instruction; though most musical structures were played on the piano while the solfége was chanted. These subjects did not sing.

Classes on Day One began with all of the subjects completing a one-page survey, to collect demographic data and information regarding previous music experience (Appendix A). A pre-test post-test design assessed the students' listening skills. Each test contained four units, though question order within each unit was varied for each test (to address validity).

1. Unit one included five questions asking subjects to discern if the audio excerpt featured a single pitch or more than one pitch.
2. The remaining units all presented three questions, each with two audio excerpts. Subjects were asked to evaluate if the two excerpts were the same or different.
3. Excerpts in unit two contained melodies, while excerpts in the remaining units featured chorale-style chord progressions.
4. Excerpts in unit three varied the outer voices without changing the chords, while excerpts in unit four varied the harmonies without changing the outer voices.

On Day One the instructor described how to build triads, using the formula notated in Figure 1. Singing subjects sang the formula, whereas non-singing subjects spoke it. Both groups marked solfége ladders, as shown in Figure 2, while reciting the formula. The procedure was repeated until every syllable had served as the root of a triad, which was used to identify chords. The tonic chord was referred to as the Do-chord; dominant the So-chord; subdominant the Fa-chord; and submediant the La-chord. Initially, only the three primary triads were memorized.

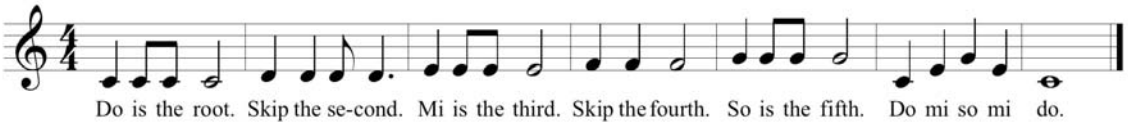

Figure 1. Formula used to build triads.

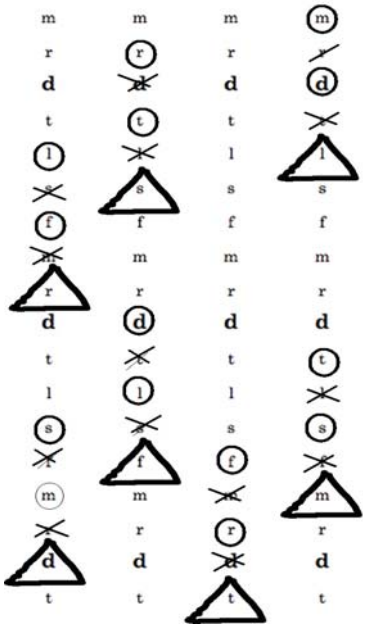

Figure 2. Solfége ladders used to build triads. Triangles are drawn around the chord root, and circles around the third and fifth.

Solfége symbols for the three primary chords were displayed on the board, all in root position. Students were asked to analyze the solfége content of each triad and to identify the common tone between the Do- and Fa-chords, and between the Do- and So-chords, indicated by the dotted lines on Figure 3.

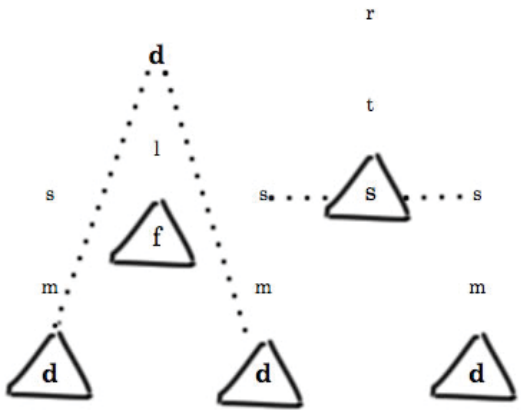

Figure 3. Dotted lines connect common tones.

Chords were re-written placing common tones adjacent to one another in a horizontal line, prompting the instructor to define the terms *root position, first inversion* and *second inversion*. Instruction on Day One ended by singing the Do-chord, Fa-chord, and So-chord in Do-Ti inversions (see Figure 4).

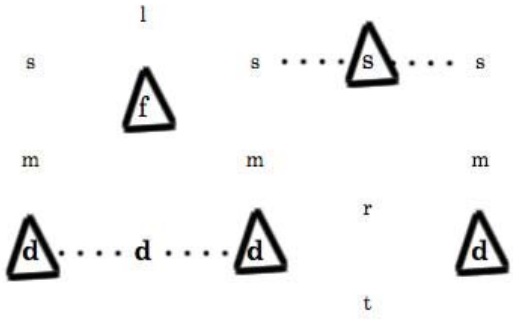

Figure 4. Solfége rearranged to place common tones in a row.

Goals for Day Two are listed below:

1. To memorize the Do-Ti inversions for the three primary triads.
2. To distinguish the distinct sound of each primary triad.
3. To learn how primary chords progress in common-practice music.
4. To listen and identify the highest and lowest pitch in a triad.

Memorizing the three primary triads in Do-Ti inversion was achieved via repetition as subjects viewed the syllables. Thirds and fifths were erased from the board to reinforce internalization.

Learning to discern the aural differences among the three primary triads was a significant purpose of this research; consequently, subjects were instructed to listen for the presence or absence of Do.

1. If Do was present, then the harmony was either a Do-chord or Fa-chord.
2. If Do was not present, then the harmony was a So-chord.

To learn how chords progress in common practice music, subjects in the singing group sang the song notated in Figure 5 while also tracing a diagram shown in Figure 6. Subjects in the non-singing group followed the same procedure, while speaking the lyrics.

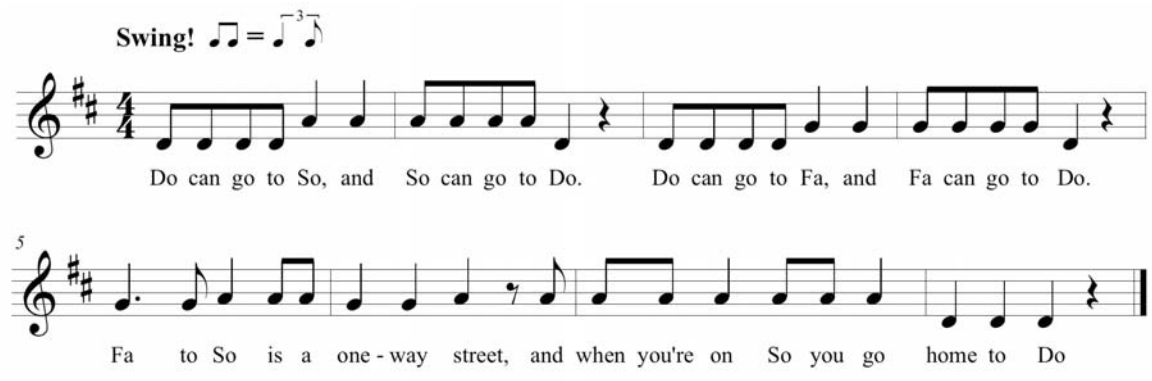

Figure 5. Text used to learn how chords could progress from one to another. Solfége syllables are the chord roots and represent the entire chord.

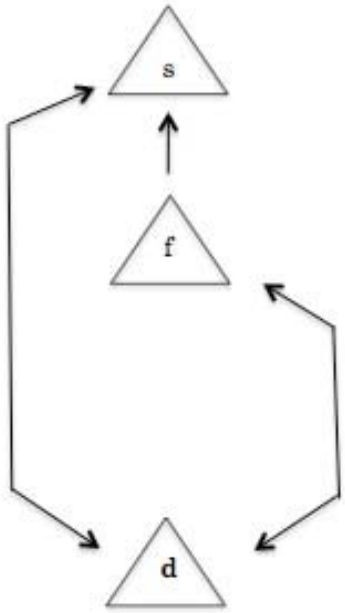

Figure 6. Diagram used to depict the song in Figure 5.

The penultimate activity on Day Two combined two skills: (1) identifying a chord via Do-Ti, and (2) knowing allowable chord progressions. Day Two concluded with instructing subjects to evaluate the lowest and highest pitches in a block-chord texture:

Day Three began with a review of the two previous classes then focused on hearing the submediant La-chord. Students practiced harmonic listening skills:

1. Analyze the Do-Ti thread in the music
2. Determine the chord root
3. Evaluate the highest and lowest pitches in each triad.

Day Four concluded with subjects taking harmonic dictation, as well as the post-test. The instructor also modeled, for both groups, how to sing chord arpeggios with a pop musical excerpt and a classical excerpt.

Results

Figure 7 presents the pre-test post-test data for all subjects, comparing the non-singing groups to the singing groups. As a whole, the non-singing groups scored higher on the pre-test than the singing groups. This difference reflects that subjects were grouped according to availability to participate in the research project during the summer months, not by the results of a diagnostic test that could have created similarly skilled groups. Regardless, it is important to note that the singing groups increase their post-test scores in all four units of question types.

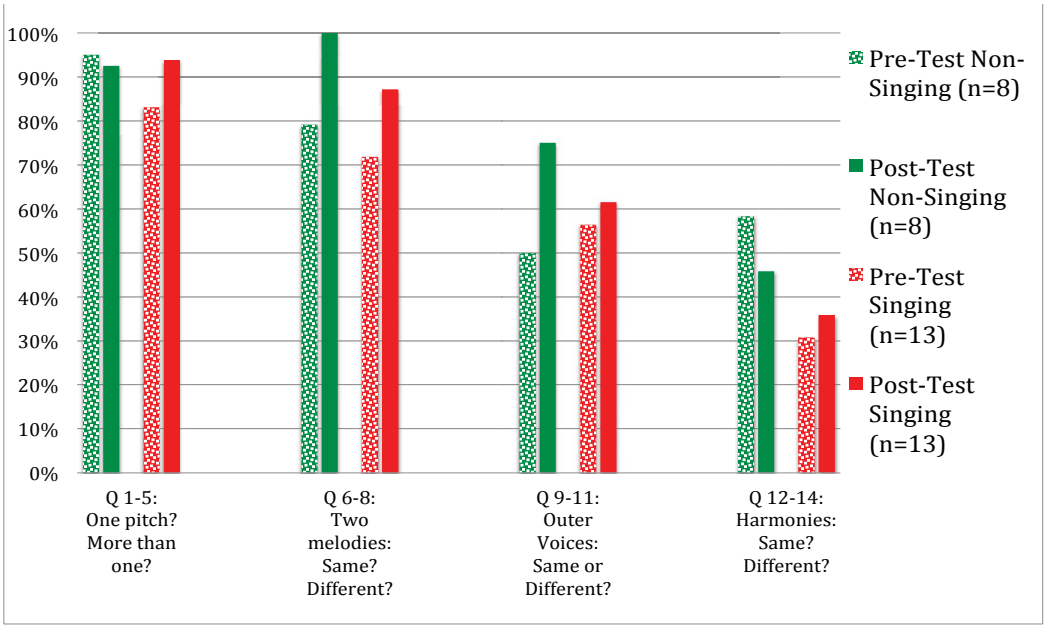

Figure 7. Pre-test, post-test results for non-singing and singing groups (organized by question groups).

Figure 8 displays the percent increase between the pre-test and post-test for both the non-singing and singing groups by comparing the average scores and the median scores. Whether calculating the increase of the average or the median, the singing groups scored higher than the non-singing groups. This is particularly true of median scores. The non-singing groups increase only 3.6%, whereas the singing groups increase 14.3%.

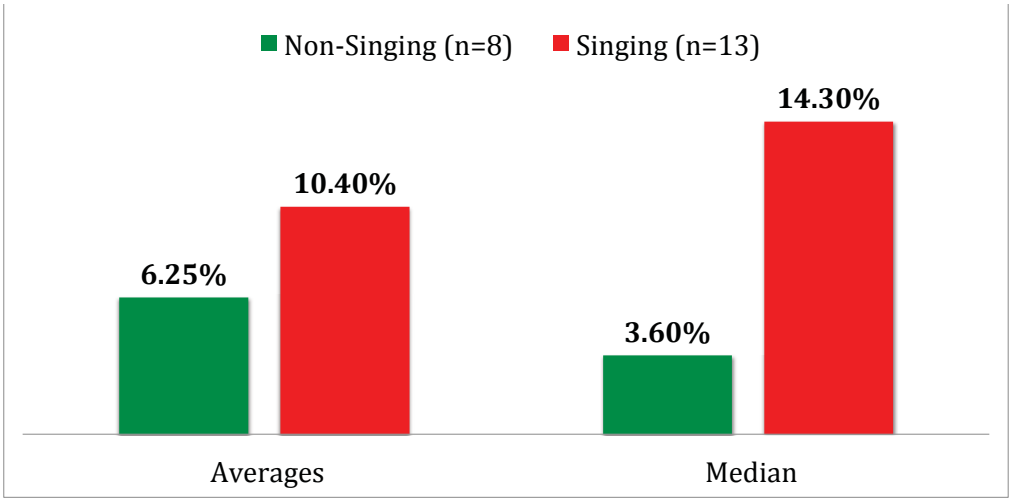

Figure 8. Percent increase in average and median scores between the pre-test and post-test.

Figure 9 compares the ability of the two groups to identify the chords in a progression. The singing groups scored higher than the non-singing groups, whether the progression is short and simple (I-IV-V-I) or long and complex (I-V-I-vi-IV-V-I). The difference between the groups is 18.3% with the former progression and 10.5% with the latter.

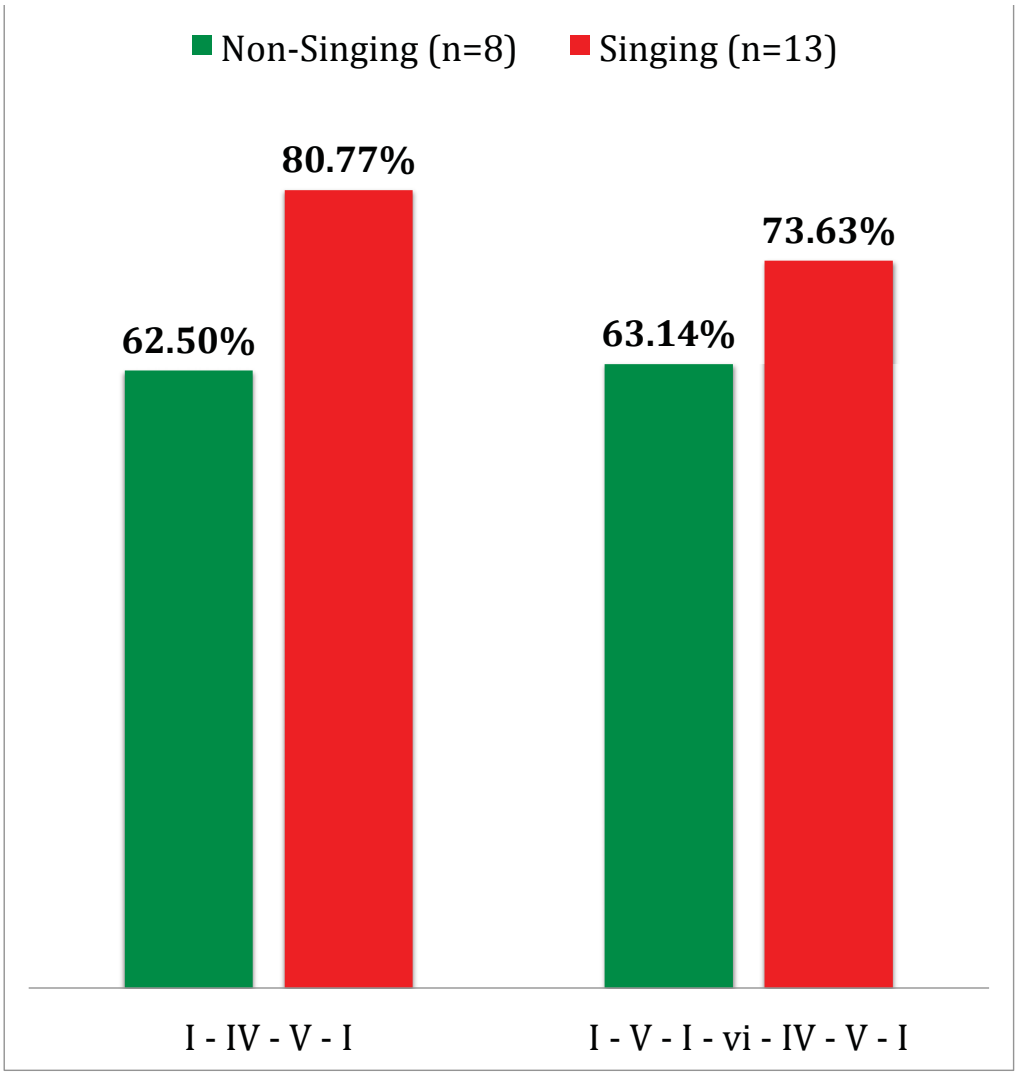

Figure 9. Comparison of non-singing and singing groups' abilities to identify harmonies in two chord progressions.

Figure 10 examines the success rate each group had for hearing the specific harmonies within both progressions: I, V, IV, and vi. More than three-quarters of the singing groups successfully identified I and V, whereas less than two-thirds of the non-singing groups recognized tonic and less than the half the dominant. A significant difference occurred between the two groups'

abilities to identify IV. The subdominant and the submediant occurred only once in each progression; thereby, the data for these harmonies is less reliable.

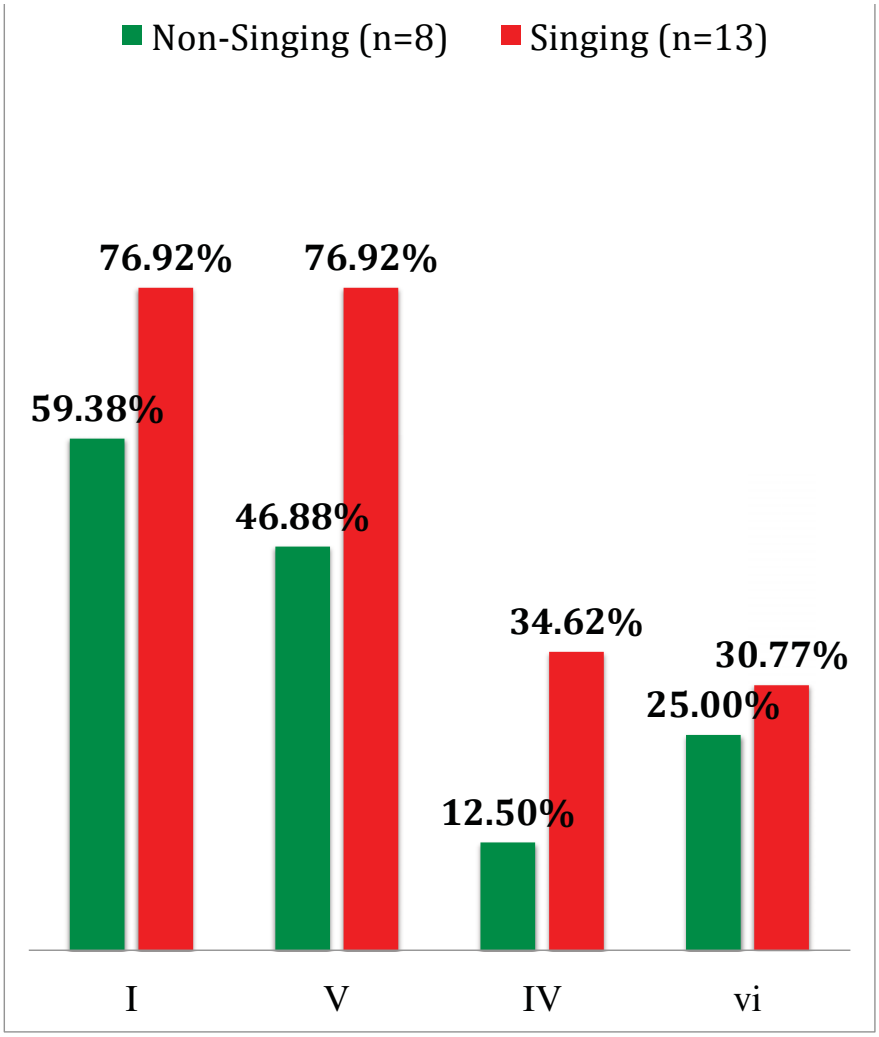

Figure 10. Comparison of non-singing and singing groups' abilities to identify I, V, IV, and vi chords.

Discussion

Aural skills instructors use a variety of strategies to teach harmonic dictation. At the college level, harmonic dictation is often practiced by notating the outer voice—first the bass, then the soprano. Given two voices, students deduce the identity of the chord. Karpinski's (2000) refers to this process as "harmonic looking," implying the harmonic dictation would involve identifying the chords first. Currently, little research exists that investigates whether or not singing experiences help students to acquire harmonic listening skills. Since universities across

the country require music students to master harmonic dictation skills as a component of their music theory curriculum, the researchers identified a need for research.

The instructional strategies used in this pilot study focused on learning to sing chord arpeggios in Do-Ti inversions within a tonal context to help identify harmonies when taking harmonic dictation. Mean scores for those students who received singing instructional strategies, and participated in singing experiences, were higher than the scores of those who did not receive singing instruction or sing themselves. Results from this pilot study were consistent with Chittum's (1969) conclusions that students who learn to sing chord arpeggios are more successful when asked to take harmonic dictation.

Even though the sample size was small, researchers have a reasonable expectation that these data suggest singing experiences are beneficial to students' harmonic listening skills. In order to make this study more comprehensive, the researchers intend to explore the differences of singing and non-singing instruction for other populations. As they further investigate the differences between using singing and non singing instructional and experiential activities, the researchers plan to test public school students in middle school students and high school. In addition, freshman university music majors will be tested.

Because this was a pilot study and the subjects were limited to members of a community youth choir, the researchers identified several components of the study that will help refine the process of taking data and more reliable data. Test subjects in this study relied upon parental support and one subject's data had to be taken out of the final results because the student's parents arrived very late on Day Four, during the post test. Parental approval will also be necessary in future studies with middle school and high school aged students, but the subjects will be in a public school setting. Also, larger groups of students will be tested for each age group.

Furthermore, subjects for this study needed to be grouped according to when parents indicated they could bring them to the classes. In the future, the researchers will group subjects of selected populations according to results of a diagnostic pre-test. Even so, the singing groups' post-test scores were greater in all four units of question types. Caution should be used when making generalizations about this study's findings because of the small sample size and challenges with dividing the students into the singing and non-singing groups. Still, the researchers agree that this study provides incentive to continue studying the differences between singing instructional strategies and experiences and non-singing instructional strategies and experiences when teaching harmonic listening skills.

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Appendix A

The Demographic Survey

Survey of Prior Musical Experiences ID: ____ ____ ____

How old are you? _____

How long have you been in the Hill Country Youth Chorus?
_____

Does your home have a piano? Yes or No

Do you take piano lessons? Yes or No

If so, how many years? _____

How often does your family sing together? (circle one)

Daily Weekly Monthly Yearly Never

What other musical experiences have you had?

Private Voice Lessons	No	Yes	How long? _____
Musical Theatre	No	Yes	How long? _____
Dance	No	Yes	How long? _____
Band/Orchestra	No	Yes	How long? _____
School Choir	No	Yes	How long? _____
Church Choir	No	Yes	How long? _____

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The Effects of Classical Guitar Ensembles on Student Self-perceptions and Acquisition of Music Skills

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Classical guitar ensembles are increasing in the United States as popular alternatives to band, choir, and orchestra. In the last 10 years, school enrollment in classical guitar ensembles has grown by as much as 400% (Streeter, 2009). With this growth arises the need to study student self-perceptions and the skills acquired in guitar ensembles. Knowing how guitar ensemble participation affects student self-perceptions and skill acquisition would clarify the benefits and weaknesses of guitar ensembles to help develop curriculum and instruction. Comparing guitar ensembles to band, choir and orchestra could offer support for the benefits of ensemble experience on the guitar.

Classical guitar ensembles are offered at many middle and high schools as fine arts electives as one of the only options for classical guitarists to participate in ensembles (Streeter, 2009). These ensembles range from class sizes of 3 to over 30 students playing nylon string guitars. Classical guitar ensembles are different from other guitar classes where students strum chords with a pick and sing songs. Classical ensemble participants play from notation and use their fingers to pluck or strum the guitar strings. The parts can be simple bass lines, accompaniment figures, or virtuosic melodies. As many as four or more parts are assigned by skill level. Similar to an orchestra, students often follow a conductor to play their parts together in time with appropriate expression and musicality. Instructors also monitor student behaviors, coordinate skills, model the parts, and set musical goals for students.

There is limited research on the benefits of school classical guitar ensembles, but there are studies on other ensemble students' self-perceptions and skill acquisitions. It is known that ensemble participation elicits the acquisition of music skills including reading unfamiliar music from sight (sight-reading) (McPherson, 1997; 2005); listening for musical qualities like shape, form, and intervals (aural skills) (May & Elliot, 1980); expressive playing (Kinney, 2004); playing without written music (playing by ear) (McPherson, 1997; 2005); creating music spontaneously (improvising) (McPherson, 1997; 2005); and playing from memory (McPherson, 1997; 2005).

Ensemble participation also has a positive influence on participant self-perceptions (Abeles, 2004; McCall, 2003; Mills, 2008; Randles, 2011). Self-perceptions can include scholastic competence, social acceptance, behavioral conduct, identity, and self-worth (Harter, 1985).

Scholastic competence refers to student perceptions of their scholastic abilities such as the belief that one is good at writing but not math. Social acceptance taps the degree to which students feel accepted by peers and have friends. Self-worth covers the extent to which students like themselves as people and are happy with the way they are.

Ensembles can have a positive influence on students' sense of identity and social acceptance (Mills, 2008). Successful experiences performing with a group can build confidence, self-esteem, friendship and community (McCall, 2003). Mills (2008) surveyed members of a community children's choir on the changes to their self-perceptions including concepts of musical, personal, and community identity, as well as perceptions of self-discipline, social skills, respect, confidence and leadership. The 12- to 14-year-old participants stated that choir offered a reliable and constant environment during a time in life full of change. Participants felt unconditional peer acceptance in choir as opposed to the harsh peer judgment at school. Mills concluded that choir enhanced student self-concept, self-esteem and self-efficacy by providing a consistent, family-like environment for students to master music and social skills.

Self-efficacy, or what students believe they are capable of, is also affected by ensemble participation (Mills, 2008). Elementary ensemble student self-efficacy can be increased by interactions with professional musicians (Abeles, 2004). Randles (2011) surveyed 1,219 students grades 4 though 12 to determine student perceptions of good musicianship, as well as the relationship between gender and self-efficacy. Girls indicated a significantly higher self-efficacy than boys. Results also showed that 44% of students chose to participate in school music programs, and student self-perceptions of being good musicians decreased with grade level. Within each grade level the top definition of a good musician was "performing/practicing on an instrument". Randles believed that including a wider selection of instruments for ensembles would help increase the participation levels of school music programs, as well as student self-efficacy. If students had more options of instruments to play, more students would take music classes. This would mean students would practice more and would therefore see themselves as good musicians.

Research indicates that students who participate in ensembles perform more expressively than students who do not. Playing in a group provides students with a model of a beautiful sound to imitate and allows for the freedom to play with spirit and enthusiasm without the fear of mistakes (McCall, 2003). Kinney (2004) compared the ability of two groups of students to perform expressively on piano. One group had high school ensemble performance experience while the other group did not. According to a panel of experts judging the groups' performances of three songs for accuracy and expression, the group with ensemble experience performed significantly more expressively than the other group. The study also indicated that school ensemble participation positively influenced the performance and perception of musical expression.

Students in ensembles also develop musical skills such as sight-reading, aural skills, playing by ear, playing from memory, and improvising. McCarthy (1969) measured groups in school band, choir, orchestra, and a control group of non-music student on their abilities to aurally perceive aesthetic elements in recorded music. He found that band and orchestra members scored higher on an aural skills test than the control group. May & Elliot (1980) studied the relationships among ensemble participation, music skills, and the number of years of private lessons on the ensemble instrument. One hundred sixty-four music students from a Midwestern school district responded to the Gaston Test of Musicality when in 4th grade and again in middle school when they were assigned to ensembles. Ensemble experience and private instruction

correlated with higher aural skills results on the Gaston test. This could be due to the increased exposure to aural skills of students who play in ensembles and take private lessons.

McPherson (1997) found that over a three-year period high school instrumentalists in band improved their abilities to sight-read, play by ear, play from memory, and to improvise. Students also develop changes in cognitive strategies for practice such as "thinking in sound" and mentally rehearsing the music prior to performance. In another longitudinal study, McPherson (2005) administered tests at the end of each school year to 3rd and 4th graders who had begun playing wind instruments in school music programs. The tests assessed students' abilities to perform rehearsed music, sight-read, play from memory, play by ear, and to improvise. Results determined that all skills improved every year. The study also suggests that teachers help ensemble students to develop a varied repertoire of tasks to learn music.

Performing in ensembles and group lessons such as Suzuki classes adds opportunities that musicians do not get from performing solo. Students get opportunities to review skills in different contexts while developing a strong foundation of skills (McCall, 2003). Group performance also teaches discipline, ensemble etiquette, musical terminology, and expectations of ensemble work. Success in group settings can motivate students because they get to perform well for others while hearing others play. Ensemble experience also provides opportunities to polish pieces, expand repertoire, develop a strong sense of rhythm, practice performing, absorb new musical ideas, and to demonstrate accomplishments. Classical guitarists can benefit from ensemble experience because much of their performance experience comes from solo repertoire and private lessons.

Method

The purpose of this study was to explore the development of self-perceptions and skill acquisition of students in classical guitar ensembles. Participants included 14 classical guitar students ages 7-15 years in a university music outreach program. All students took weekly private classical guitar lessons and guitar ensemble classes from graduate music students. Students were grouped by age and skill level into three beginner ensembles: Group A (n=4; 7-9 years), Group B (n=5; 9-11 years), and Group C (n=5; 10-15 years). All students had taken private lessons for between one and three years except one student who had taken more than four years. All students had taken less than three years of guitar ensemble classes. Ensemble classes were 50 minutes long and took place at a large university in the southwestern United States.

Systematic observation of 220 minutes of video data collected over a 12-week period was used to determine whether students demonstrated music skills associated with good tone and playing in time in an ensemble. Five weeks of video were recorded: two at the beginning of the 12 weeks, two in the middle of the term, and one at the end for a total of 11 videos. Two 10-minute video clips were randomly selected from each video between the time the students were tuned and seated and when the lesson ended. A total of 220 minutes of video data from 22 ten-minute clips was observed and analyzed using a checklist of specific student behaviors. Behaviors included "correct posture," "correct instrument position," "correct right hand setup," "correct right hand movement," "uses a footstool," and "quiet during instructions or performances." If a student demonstrated the skill at least once, "yes" was placed next to his or her name. If a student never demonstrated a skill, "no" was placed next to his or her name. If a skill was not visible for a student or data were not available, this was indicated with "NV" and "NA." For instance, if a music stand was blocking the view of a student's right hand then right

hand skills would be marked "NV." Students were numbered from left to right from the conductor's perspective. If something obstructed the view of a student for all skills, each skill was marked NV. NA was used if there were more students numbered on the checklist than students in the video. This observation procedure was repeated for each video clip. Tone was measured from behavioral, not auditory observations and not auditory. This was because of the subjectivity of how good tone sounds and to the variability of the video and audio quality. Five graduate music education students analyzed 10 video clips for reliability purposes. Reliability ranged from 60% to 100% agreement with a mean of 83.3%.

All students took either the Self-Perception Profile for Children (Harter, 1985) for ages 7-13 years or the Self-Perception Profile for Adolescents (Harter, 1988) for ages 14-18 years. These surveys were administered at the end of the 12-week period. Participants answered approximately 40 questions using a forced-choice four-point Likert-like scale. All students answered questions related to student perceptions of their scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct, and global self-worth. The two adolescent students answered additional questions on job competence, romantic appeal, and close friendship. Results were compared to similar questions students answered about the importance of each subscale to determine discrepancies between their competence, importance and global self-worth scores. Ensemble instructors answered similar questions on their perceptions of their students for reliability purposes. Students also took a short multiple-choice questionnaire designed by the researcher on their musical experience, practicing behaviors and musical preferences (see Appendix 1).

Results

Two hundred and twenty minutes of video were analyzed for student skills from weeks 1, 3, 6, 9, and 12 of the 12-week period. All three groups A (n=4; 7-9 years), B (n=5; 9-11 years), and C (n=5; 12-15 years) demonstrated between 85% and 100% of skills for each video clip. The youngest ensemble Group A always demonstrated at least 98% of skills on the checklist of behavioral observations. Group B demonstrated 86% of skills the first week and 95% the last week. Group C demonstrated 99% of skills the third week, 85% the 6th week, and 97% the 9th week of the observation period (See Table 1). The skill of being quiet during instructions or performances was demonstrated 80% of the time, making it the skill demonstrated the least. Students showed correct posture for 94% of the videos. All students demonstrated correct right hand setup 100% of the time in all video clips (Table 2).

Table 1

Group Demonstration of Total Skills as Percentages By Week From the Observation Period

Group	Week 1	Week 3	Week 6	Week 9	Week 12
A (7-9 years)	100	98	NA	100	NA
B (9-11 years)	86	88	97	90	95
C (10-15 years)	NA	98	85	97	NA

Table 2

Students Ordered by Group Total Percentages of Skills Demonstrated During the Observation Period

Student & Group	Correct Posture %	Correct Instrument Position %	Correct Right Hand Setup %	Correct Right Hand Movement %	Uses a Footstool %	Quiet During Instructions of Performances %
1-A	100	100	100	100	100	100
2-A	100	100	100	100	100	100
3-A	100	100	100	100	100	100
4-A	100	100	100	67	100	100
5-B	100	100	100	100	100	80
6-B	100	100	100	100	100	88
7-B	67	83	100	67	100	75
8-B	83	83	100	60	100	17
9-B	100	100	100	100	67	67
10-C	67	67	100	100	50	100
11-C	100	100	100	100	100	100
12-C	100	100	100	100	100	100
13-C	100	100	100	100	100	66
14-C	100	100	100	100	100	33

The students completed the Self-Perception Profile for either children (Harter, 1985) or adolescents (Harter, 1988), which consisted of the following subscales: scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct, and global self-worth. The two adolescent students completed the additional subscales of job competence, romantic appeal, and close friendship. Following the profile manual, the student self-perception subscales were rated between 1 and 4 with anything at or above 3 being considered high and anything below 2 low. Different patterns emerged for all students. In general, individual students scored higher than the published norm across all subscales. Data for individual student subscale averages are presented in Figure 1. All but two students had high averages for physical appearance. Global self-worth was high in all but one student who also had the lowest social acceptance and physical appearance. The two adolescent students had high means for job competence, romantic appeal and close friendship.

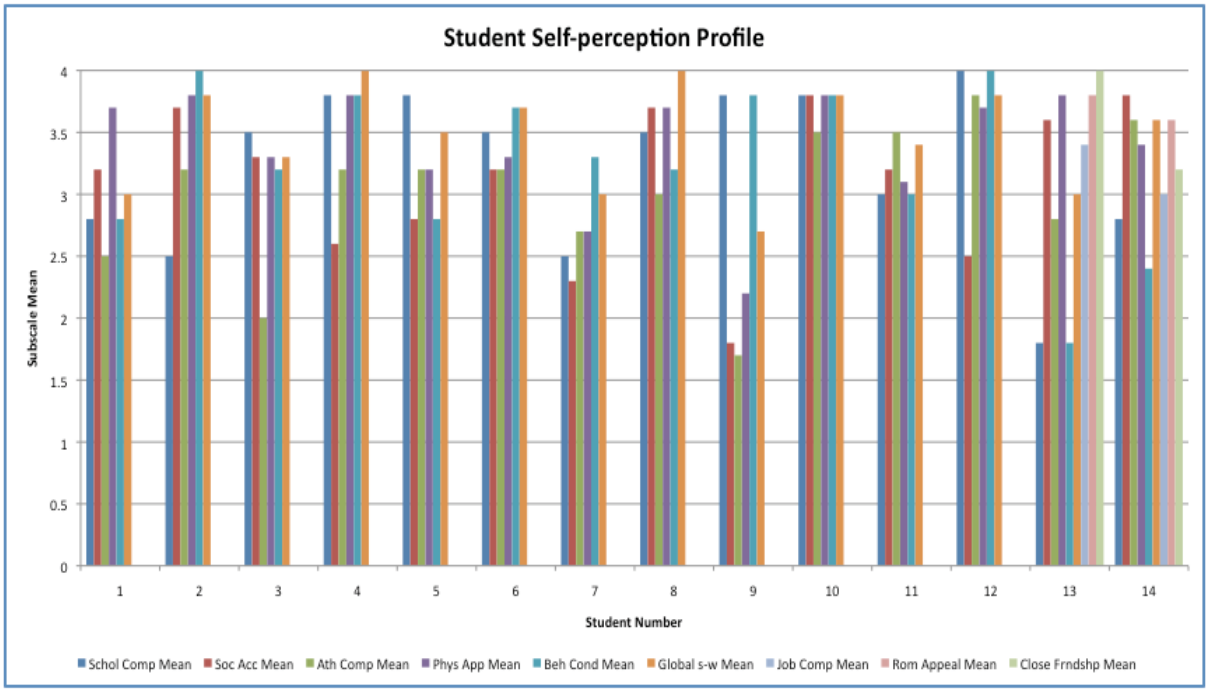

Figure 1. Self-perception subscores for individual students. Students 1-7 were in 3rd grade; students 8 & 10 were in 4th grade; student 9 was in 5th grade; student 11 was in 6th; student 12 was in 7th; student 13 was in 9th; and student 14 was in 10th grade. High scores are those at or above 3. Low scores are below 2.

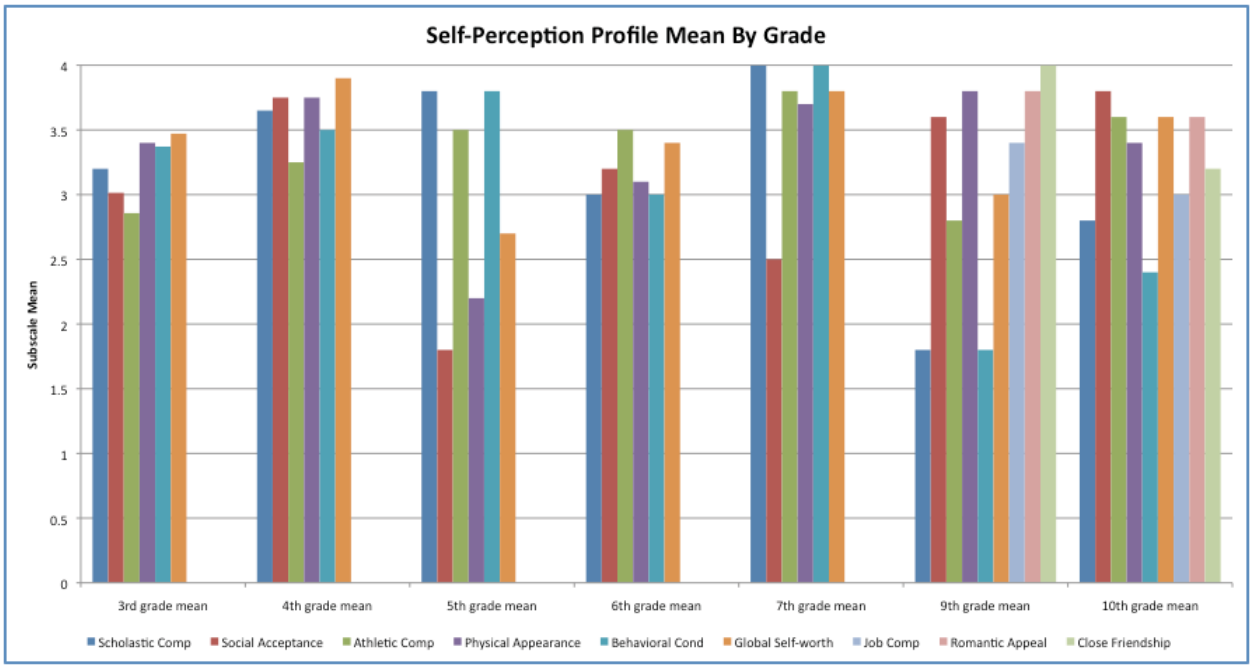

Figure 2. Self-perception profile mean by grade. Grade level numbers were: 3rd grade (n=7); 4th grade (n=2); 5th grade (n=1); 6th grade (n=1); 7th grade (n=1); 9th grade (n=1); and 10th grade (n=1).

Figure 2 represents the self-perception profile mean scores by grade. Generally all subscales were high with the exception of three that were low. Figure 3 shows the deviation between the present study's self-perception subscale means and the norms presented in the manual for Harter's Self-Perception Profile (1985 & 1988). Third, fourth, and sixth grade students had deviations at or above zero meaning the present study's sample scored higher than the norm on all subscales. Seventh grade students had all positive deviations except for social acceptance. The largest deviations (above +1.0) were for ninth grade romantic appeal and physical appearance, and seventh grade scholastic competence and behavioral conduct. The smallest deviations (below -1.0) were for fifth grade social acceptance, and ninth grade scholastic competence and behavioral conduct.

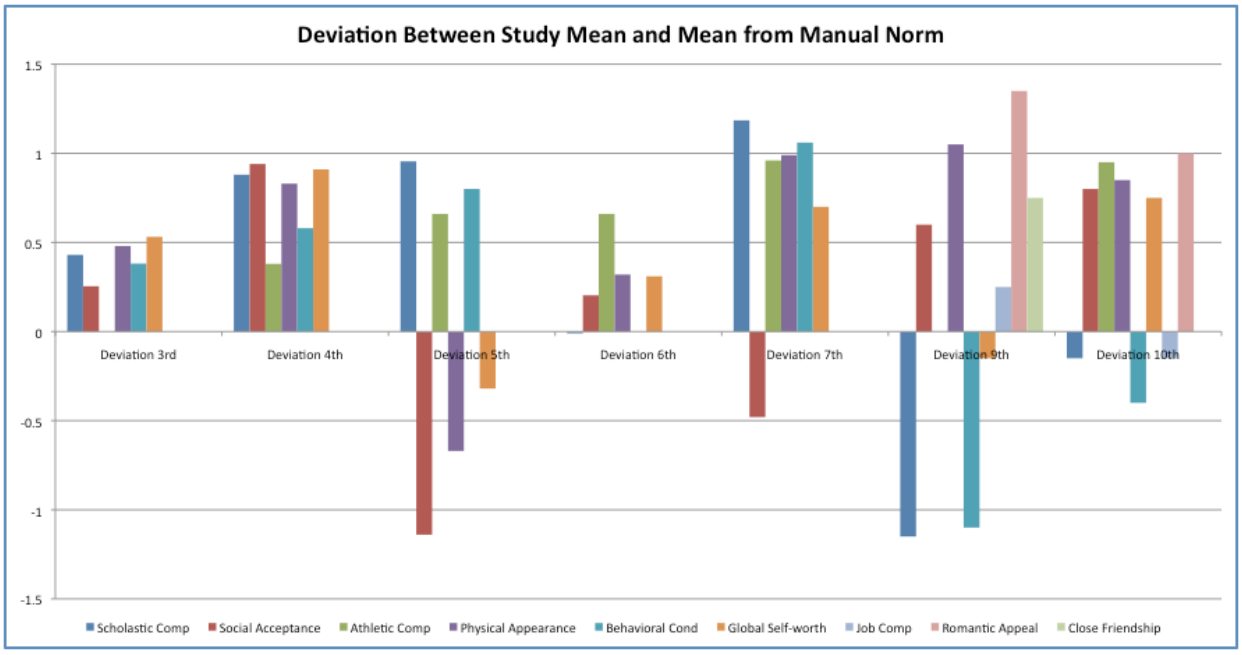

Figure 3. Deviation by grade level of the present study's subscale means and the means of the norms from Harter's Self-Perception Profiles (Harter 1985 & 1988). Positive values indicate the present study's sample scored higher than the norm presented in the profile manual.

Results of the researcher-designed multiple-choice questionnaire provided additional background information on the students (see Appendix 1 for the questions asked). The youngest students in Group A reported practicing twice a day for average sessions of 25 minutes, while Group B practiced more frequently for shorter sessions. Group C practiced as frequently as Group A but for 10 minutes longer each session. Half of the students played instruments other than classical guitar including piano, bass, drums, recorder, electric guitar and electric DJ system, and eight students had family members who play music. One student had studied classical guitar for more than four years, and had the most guitar ensemble experience with three years. All but one student practiced repertoire from their solo lesson book, while all but three practiced guitar ensemble music. Six students practiced self-composed music. Three students played in other ensembles including band, church choir, and a high school guitar ensemble.

Discussion

The results from the behavioral observations of student skills indicate the students in Group A (*n*=4; 7-9 years) consistently demonstrated skill mastery while the other groups (Group B: *n*=5, 9-11 years; Group C: *n*=5, 10-15 years) demonstrated skill mastery less consistently (See Table 1). This difference in consistency between groups could be due to the age and number of participants in each group, as well as the amount of instructor training and experience. The four students in Group A were between 7-9 years of age and possibly easier to manage than the five students aged 9 to 11 years in Group B. The instructor of Group A was a music education graduate student with more teacher training than the other instructors who were all performance graduate students with limited teacher training. The instructor's extra training in education principles may have resulted in more consistent expectations and directions for students to demonstrate certain skills.

Skills with which Group B had difficulty with were being quiet during instructions from the teacher or while other students performed. Group B's skills improved at the end of the observation period when the instructor set up behavioral expectations that prevented the students from talking during directions or performances. There was a noticeable change in Group B's behavior during two lessons with two different substitute teachers. One substitute was stricter about listening during directions, and curiously during that particular lesson students demonstrated more consistent skills. It is possible that the increase in student skills demonstrated for that lesson was due to clarity of the teacher's directions and expectations of students. The students demonstrated fewer skills with the other substitute, possibly due to a lack of the instructor's classroom experience and behavioral expectations. Group B could have demonstrated a higher percentage of being quiet during instructions towards the beginning of the observation period if the instructor had established rules for classroom behavior at the beginning of the semester. Group C demonstrated fewer skills during week six when one student did not have a footstool and therefore also had poor posture and instrument position.

A difference in feedback was also evident among the different instructors. The instructor for Group A gave frequent and specific feedback to individual students while the other two instructors gave infrequent general group feedback. The consistent higher success of Group A may have been due to the frequent specific feedback the instructor gave as well as how much the instructor moved around the classroom to help students and keep them on task. For the other groups, rehearsals were often structured with the students performing a piece several times followed by the instructor giving vague group feedback and then moving on to the next piece. In many instances the instructors for groups B and C gave no feedback after students completed a performance.

Guitar ensembles provide a group experience for students to practice and reinforce skills. Students may be motivated by their peers to perform at approximately the same level as other students. For instance, students in Group A may not usually demonstrate consistent skills while practicing at home or in their private lessons, but when they see other students demonstrating skills they may become more likely to imitate their skills and behaviors. Students who have good posture model good posture to other students in the ensemble. Unfortunately, students who talk or play while the instructor talks also model this bad behavior for other students to imitate. Considering that guitarists often practice alone, it is important for them to have group experiences with positive models from the instructor and the other students to imitate and learn from.

The self-perception profile is useful for getting data on various aspects of students' personalities from the student point of view. Teachers can determine much about students' personalities from interactions in the classroom but cannot tell much about how students see themselves. The subscale global self-worth is especially relevant to students in ensembles because it reveals something about the students that teachers could not otherwise know; that is, it depicts how students view themselves as a whole and the way they feel about how they are leading their lives. Global self-worth subscale gives a glimpse of whether or not an individual is happy with his or her life. A high global self-worth could be attributable to routine activities in which students participate that define and shape their perceptions such as guitar ensembles. For instance, success in a group setting playing guitar could inspire a student to value his or her life more than if he or she did not have a successful ensemble experience. Another particularly valuable subscale is social acceptance because ensemble participation can also provide meaningful social interactions for students and opportunities to feel more accepted by their ensemble peers. Routine interactions with other musicians allow students to share a common experience, make friends, and practice social skills necessary for the perception of feeling socially accepted.

Results of the self-perceptions profile suggest many relationships between the profile subscales. Scholastic competence and behavioral conduct were generally rated at approximately the same level for individual students. This could mean that students who see themselves as intelligent also see themselves as well behaved or vice versa. Only grades 9 and 10 had scholastic competence and behavioral conduct means lower than the means from the manual norm, suggesting a relationship for adolescents between playing in classical guitar ensembles and not performing or behaving well in school. This may be due to adolescents having a stereotyped image of guitarists as misbehaving and rebellious. The romantic appeal of the adolescents was higher than the manual norm. The difference was possibly related to the exposure of adolescents to pop-culture images of guitarists portrayed as attractive and romantically desirable. All grades except for fifth had physical appearance means higher than the manual norm, implying either guitar ensembles, or music in general, boost student self-perceptions of appearance, or students who already have high physical appearance are likely to join a guitar ensemble. The low physical appearance, social acceptance, and global self-worth scores for fifth grade could be due to there being only one student in that grade and likely would increase if the sample included more fifth graders. The scores for this particular student imply a self-perception as intelligent and well behaved but unaccepted by peers and unhappy with how his or her life is going.

Global self-worth refers to student perceptions about how they are leading their lives (Harter, 1985) and the global self-worth scores in this study are generally similar to the scores of the other subscales. Harter suggests global self-worth scores are related to the discrepancy between how students score on each subscale and their perceptions of the importance of each subscale (1985, 1988). This is supported by the two grades in this study with the lowest global self-worth (fifth and ninth) also having the lowest discrepancy between their subscale scores and their importance scores. All other grades had global self-worth means higher than the manual norm, indicating that a relationship may exist between playing in guitar ensembles and having a high global self-worth. Future studies could determine if there is a relationship between global self-worth and guitar ensembles by using a larger sample with a control group of similar students not in guitar ensembles.

Future research could be improved by increasing the sample, having a control group, extending the timeframe for both self-perception and behavioral changes, creating a multiple

baseline design for the behavior observations, and administering a pre- and post-test for the self-perception profile. An extended timeframe with multiple baselines and a self-perception post-test would be better able to determine changes occurring as a result of participation in guitar ensembles. A larger sample and multiple groups would help show if the relationships found in this study only occur in guitar ensembles, or if they could also appear in orchestra students, or students with no ensemble experience.

Appendix 1

Questionnaire:

1. How many times a day do you practice guitar?

a) 5 or more times,
b) 3-4 times
c) 1-2 times
d) none

2. How long do you practice guitar each time you play?

a) 45 minutes or more
b) 20-45 minutes
c) 10-20 minutes
d) less than 10 minutes

3. Do you play any other instruments? Which ones?

a) No
b) Yes _____

4. How many live concerts have you been to in the last 2 months?

a) more than 5
b) 3-4
c) 1-2
d) none

5. How much time a day do you spend listening to music?

a) more than 2 hours
b) 1-2 hours
c) 30-60 minutes
d) 0-30 minutes

6. Do you play in any other ensembles? Which ones?
a) No
b) Yes _____

7. Which of the following do you practice on guitar at home?

a) guitar ensemble music
b) solo music from a lesson book
c) music not learned in lessons
d) music you write or compose

8. Who do you practice guitar with at home?
a) no one
b) parent
c) sibling
d) friend

9. Do any other family members play music at home? Who?

a) No
b) Yes, siblings
c) Yes, parents

10. What is your favorite part of playing guitar?

a) playing with your teacher in lessons
b) playing solo in lessons
c) playing with others in ensembles
d) playing solo at home
e) playing with others at home

11. How long have you been playing guitar?
a) 1 year
b) 2 years
c) 3 years
d) 4 or more years

12. How long have you played in guitar ensembles?
a) 1 year
b) 2 years
c) 3 years
d) 4 or more years

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Predicting Undergraduate Music Education Majors' Collegiate Achievement

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In order for teachers to guide students in their preparation to be music majors, it would be useful to know those musical components that best predict overall collegiate success. Research has measured collegiate success in terms of grade point average, but many of these studies have tended to be in the general education literature. For example, studies have documented that degree satisfaction (Suhre, Jansen, & Harskamp, 2007), personal background (Betts & Morell, 1999) and participation in formal activities on campus (Fischer, 2007) are statistically significant predictors of collegiate academic achievement. Researchers have also investigated ethnicity issues in terms of collegiate success, with Zwick and Sklar (2005) finding that high school grade point average may be an incomplete predictor of first year grade point average for certain ethnic populations, and Jenkins, Hargurg, Weissberg, and Donnelly (2004) finding that collegiate grade point average did not differ across minority group students' whose parents were native versus those students whose parents were born outside of the United States.

Studies in music have had mixed findings across various age groups for academic achievement. Hedden (1982) found that academic achievement was a statistically significant predictor of music achievement for elementary students, and Barrett (1993) suggested that academic ability may be contingent on aptitude scores for her sample of 6-8 year olds. Costa-Giomi (1999), however, found no differences in elementary students' cognitive scores across those taking piano lessons for three years and those not taking piano. In a study of high school instrumentalists, Gromko (2004) noted that spatial skills were significantly related to sight-reading achievement. With undergraduate music education students, Hearson (1983) found that student teaching success was not significantly related to academic achievement, while a study of music education master's students found that the best predictor of overall grade point average in the degree was performance in the first music education class (Figg, 1980).

Many of the studies that have addressed undergraduate collegiate success in music have approached the topic through the lens of music theory classes. In one series of studies (Harrison, 1990a, b, 1996; Harrison, Asmus, & Serpe, 1994), musical and academic variables were used to predict theory-based achievement. For a group of non-music majors, Harrison (1996) noted that years of performance experience accounted for the most variance in theory grades. For music theory students, music aptitude was the best predictor of aural skills ability (Harrison, Asmus, & Serpe, 1994). For freshman music majors, the math section of the SAT test was a strong

predictor of written theory grades (Harrison, 1990a, b). Musical measures of piano experience and primary instrument family also tended to be strong predictor variables (Harrison, 1990a).

Performance variables such as piano and instrument experiences have also been investigated in terms of other areas of musical development. Daniels (1986) found that being a high school choral student who played a music instrument predicted sight singing achievement, as did having a piano in the students' home, while Weaver (1996) found no significant relationships between playing by ear achievement and grades in written music theory, music history or class piano for collegiate freshmen. With undergraduate instrumental music educators, Humphreys (1986) found piano to be only a weak predictor of auditory performance, and Brand and Burnsed (1981) noted no significant relationship between the predictor variables instrument playing, lessons, and piano and error detection skill. While some researchers have noted that highly skilled students tended to take private lessons (Hamann, 1982, 1983, 1984; Hamann & Sobaje, 1983; Killian & Henry, 2005; Rohwer & Rohwer, 2006), other studies have not found private lesson benefits (May & Elliott, 1980), or have documented qualifying factors. For instance, Sloboda and Howe (1991) found that the more skilled students in their study had taken fewer private lessons in their youth than had the less skilled students.

There is a need for a study to investigate student success in college based on musical factors. Specifically it would be useful to know if similar variables predict collegiate achievement with undergraduate music education majors as have been found to predict music theory achievement for other populations. In addition, while there have been studies conducted on music outcomes related to lessons, music theory, and piano, there is a noticeable dearth of research in the music education literature on music history. Since private lessons on a student's primary instrument, music theory, piano instruction, and music history are all common components of music cores for music majors across the country it would be useful to investigate the predictive nature of these core classes. By understanding the degree to which the linear combination of these variables is predictive of collegiate success (as operationally defined by Grade Point Average [GPA] in this study), high school teachers may be able to guide music students in the types of skills that could align with collegiate achievement. The purpose of the current study was to measure the relationship of predictor variables (Lessons, Music History, Music Theory, and Piano) to collegiate GPA for undergraduate music education majors.

Method

Participants in the current study were 90 music education undergraduate majors from a large southwestern university. The sample size in this study exceeded the sample size numbers set by Cohen (1988) to detect a medium effect size at .05 with power at 80% with four multiple regression predictor variables (Lessons, Music History, Music Theory, and Piano). Each of the 90 students had completed their first music education course, 43 students in the fall, and 47 students in the spring. The 58 males and 32 females were instrumentalists (n = 69, with 30 brass, 22 woodwinds, 10 percussionists, and 7 strings) and vocalists (n = 21) and were either sophomores (n = 41) or juniors (n = 49). The students' overall high school GPAs averaged 3.45 (SD = .43) and their entering SATs averaged 1152 (SD = 141.81).

The dependent variable in the current study was GPA. Student GPA was documented through the students' cumulative GPA over their time in college (two to three years of coursework). The data set for the prediction variable, Lessons, was gathered based on grades in the students' first of seven semesters of lessons on their primary instrument or voice part. The

data set for the prediction variable, Music History, was gathered based on grades in the students' first of four music history courses. The data set for the prediction variable, Music Theory, was gathered based on grades in the students' first of four music theory courses. The data set for the prediction variable, Piano, was gathered based on grades in the students' first of four semesters of class piano instruction.

While the original data set had 92 participant responses, two sets of scores were taken out as outliers, thereby leaving the final data set at $N = 90$. After the removal of the two outliers, an analysis of the assumption of normality showed two non-normal variables, Lessons and Piano, that were subsequently transformed to moderate skewness and kurtosis values. Next, multivariate analysis of residuals distributions, normal probability plots, and independence of residuals tests showed that the assumptions for multiple regression were tenable.

The bivariate correlations (see Table 1) between each predictor variable and GPA were moderate to strong (.48 to .78) and the correlations across the predictor variables were all smaller correlations (.23 to .43) than those found between the predictor variables and the dependent variable, thus documenting that multiple regression was an appropriate statistic to use with this data set.

Table 1

Bivariate Correlations between the Original Variables

	GPA	Lessons	Piano	History
Lessons	.48			
Piano	.61	.42		
Music History	.59	.23	.38	
Music Theory	.78	.29	.43	.38

Based on the correlations, concerns with the independent variables correlating strongly with each other (multicollinearity) were relatively small, with the moderately sharing variables being Music Theory/Piano and Lessons/Piano. It should be noted, then, that the predictive nature of these variables might be attenuated by the relationship between the variables. Further collinearity checks were documented through low VIF levels (all variables at 1.74 or below).

Results

The dependent variable, GPA, ranged from 1.83 to 3.97 ($M = 3.35$, $SD = 4.49$). The predictor variables were Lessons [untransformed descriptive data ranged from 1 (grade of D) to 4 (grade of A), $M = 3.68$, $SD = .61$], Music History [ranged from 0 (grade of F) to 4 (grade of A), $M = 3.02$, $SD = 1.07$], Music Theory [ranged from 0 (grade of F) to 4 (grade of A), $M = 2.74$, *SD*

= 1.00], and Piano [untransformed descriptive data ranged from 0 (grade of F) to 4 (grade of A), $M = 3.32$, SD = .87].

All four variables were entered into the regression equation simultaneously. The complete model including all variables was significant at $p < .0000001$ (See Table 2). The $R^2 = .79$ and Adjusted $R^2 = .78$ showed little shrinkage and documented that the equation explained 78-79% of the variance in collegiate GPA (See Table 3). Each of the four variables entered the equation significantly ($p < .01$) and the standardized regression coefficient (Beta) documented the explanatory power of the variables to be in the following order: Music Theory (.54), Music History (.27), Piano (.19), and Lessons (.18) (see Table 4). Structure coefficients documented a different order between Music History and Piano than was found with the standardized regression coefficients, with the order being: Music Theory (.88), Piano (.69), Music History (.66) and Lessons (.61). In both the standardized regression coefficient order and the structure coefficient order, Music Theory was the dominant predictor. The different order in terms of the Piano/Music History variables may mean that Piano may be a better predictor than the standardized regression coefficients can document because the variance in Piano was also shared by other predictor variables.

Table 2

ANOVA for the Regression Model

	df	*SS*	*MS*	*F*	*p*
Model	4	14.13	3.53	79.42	<.0000001
Residual	85	3.78	.04		
Total	89	17.91			

Table 3

Results of the Regression Analysis

	R	R^2	Adjusted R^2	Standard error
Model	.89	.79	.78	.21

Table 4

Results of Variable Weights in the Regression Model

	Structure Coefficients	Standardized Coefficients Beta	*t*	*p*
Lessons	.61	.18	3.33	.001
Piano	.69	.19	3.22	.002
Music History	.66	.27	4.81	.0000006
Music Theory	.88	.54	9.45	<.000000001

Discussion

Results for the current study document that the combination of common music core classes (Lessons, Music History, Music Theory, and Piano) can predict, in a statistically significant manner, music education majors' overall collegiate Grade Point Average (GPA). Of the core classes, Music Theory was the strongest predictor of GPA, followed by Music History and Piano, and finally Lessons.

The result from the current study that Music Theory was a strong predictor of GPA is similar to results of studies by Harrison (1990a, b) who found that the math section of the SAT significantly predicted written theory achievement. The finding that academic music classes (Music Theory and Music History) were both statistically significant predictors may mean that these academic music classes may have similar ways of thinking to classes in the general collegiate curricula. If indeed Music Theory and Music History achievement may be related to collegiate thought processes, then it may be beneficial for students who are preparing for college and teachers of students who are preparing for college to consider the variety of ways that students can experience music education prior to college.

For instance, high school students may wish to consider seeking out the diversity of experiences that a normal college music core often provides. In the area of academic music, one of these experiences could include taking an AP Music Theory class. Also, private piano lessons in some areas of the country have sequenced theory curricula that are taught in lessons and then students take theory tests each year for medals. Finally, many community colleges now offer course options for junior or senior high school students. Students may be able to take a college-level music theory course and have it substitute for an elective in their high school requirements. Students who could partake in such an activities may be engaging in musical activities that could align with their future collegiate experiences.

Public school ensemble teachers may be able to aid in their students' exposure to potentially valuable experiences by advocating that AP Music Theory be a class that is taught at their schools, if it is not already. In the case of those schools that cannot feasibly have AP Music

Theory classes and/or in cases where teachers simply want to expose their students to a variety of musical experiences, public school ensemble settings can be structured as viable instructional settings for students to experience the academic side of music in addition to their performance experiences. Ensemble instruction that could highlight theoretical understanding in relation to music being played in the ensemble setting may help engage students in a way of thinking that could broaden their musical experience as well as potentially prepare the students for thought processes that may align with their future collegiate lives. Since music history is not as commonly taught as a class in the public schools, teachers could add music history content into their ensemble curricula. Ensemble music could be studied in its historic context and other music listening examples could be introduced to train critical music listening and thinking skills that may be able to help students grow as future music majors.

The finding that Piano and Lessons were also statistically significant predictors of GPA in the current study is in agreement with some past studies and contrary to others. While piano was found to be a predictor of GPA in Harrison (1990s), other studies found little to no predictive power for Piano (Humphreys, 1986; Brand & Burnsed, 1981; Weaver, 1996). And, while Hamann (1982, 1983, 1984), Hamann and Sobaje (1983), Killian and Henry (2005), and Rohwer and Rohwer (2006) noted benefits related to Lessons, May and Elliott (1980) found no such benefits. The differences between these findings may be related to their outcome variables, their populations, or other extraneous variables. More research on Piano and Lessons may help clarify the variables that are interacting with these musical experiences.

For the current study's sample of music education undergrads, the variables Piano and Lessons were related to overall GPA. Hence, it may be useful for high school students to consider adding these experiences to their traditional public school ensemble participation. Such activities might include weekly piano instruction and primary instrument lessons that could culminate in an assessment, such as a formal jury or an adjudicated performance. Students may then be exposing themselves to activities that could familiarize them with standard collegiate coursework. In this way, students also may become acculturated to standard processes, thereby potentially having the students be more comfortable with collegiate practices when they become undergraduate students.

Universities may be able to assist students in their transition from public school music student to collegiate music major by communicating the common music core requirements for all music majors at their institutions. True we should communicate the core requirements, but I'm not certain how her study addresses this idea. Since students tend to visit colleges of music to audition for acceptance to the program, this may be an opportune time to discuss preparation ideas for success in freshman-year core music classes. Since theory understanding may be a freshman challenge in many colleges of music, universities that have an online theory preparation course may be helping students start their freshman year with an advantage.

Future research that could replicate these findings in other collegiate settings could be valuable. In addition, studies that could look at differences in collegiate achievement based on high school experiences may also add to our understanding of this complex area of inquiry. Studies that can be added to the body of literature concerning success as a music major may help teachers assist students in their transition from public school student into music major, which is a practical and useful goal for the betterment of music education.

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Socioeconomic Status and Band Contest Ratings

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The Mission Statement of The National Association for Music Education (2011) states "every individual should be guaranteed the opportunity to learn music and to share in musical experiences." However, it is possible that not all children in this country are given the same musical opportunities and experiences. To what extent does socioeconomic status impact the quality of music education available to students? What impact does it have on musical achievement? This study explores these issues by examining the relationship between socioeconomic status and the ratings of Texas middle school and high school bands at concert and sight-reading contests.

The University Interscholastic League (UIL) governs Texas public school academic, athletic, and music contests and is the largest inter-school organization of its kind in the world (University Interscholastic League, n.d.a). The music division of UIL is an important part of music education in Texas, with over half a million middle school and high school students participating in UIL music events annually (University Interscholastic League, n.d.b). Each spring UIL Band Concert and Sightreading Contests are held in every UIL region across Texas (University Interscholastic League, 2011). According to UIL's Constitution and Contest Rules (2011), these contests consist of a concert portion, in which bands perform three prepared contest selections, and a sight-reading portion, in which students read a new piece of music. A panel of three judges evaluates the concert portion of the contest and a separate panel of three judges evaluates the sight-reading portion. Each judge gives each band a rating from 1 to 5, with 1 being the highest rating. The scores within each panel are then averaged to give each band a composite rating for their concert performance and one for their sight-reading performance. Schools may enter more than one band in the contest, with the top band being designated as Varsity, the second as Non-varsity, and the third as Sub Non-varsity.

Bornstein and Bradley (2003) defined socioeconomic status (SES) as "the relative position of individuals, families, or groups in stratified social systems where some societal values (e.g., occupational prestige, education) are not uniformly distributed" (p. 2). In this study, SES was defined using data from the Texas Education Agency (TEA). TEA calculates the percentage of economically disadvantaged students for each school in Texas by taking the sum of all students eligible for free or reduced lunch or eligible for other public assistance and then dividing by the total number of students (Texas

Education Agency, 2010). These data for Texas schools are published annually in the Academic Excellence Indicator System (AEIS) reports (Texas Education Agency, n.d.).

Eligibility for free or reduced lunch is frequently used as a measure of poverty and socioeconomic disadvantage (Fitzpatrick, 2006; Nichols, 2003). Free or reduced lunch is issued on the basis of the Income Eligibility Guidelines, which are employed by all schools, institutions, and facilities participating in the National School Lunch Program (National School Lunch Program, 2011). For the 2009-2010 school year (the most recent year for the which the Texas AEIS reports are available), a family of four would need to make $40,793 or less to receive reduced lunch or $28,665 or less to receive free lunch (Food and Nutrition Service, USDA, 2009).

Researchers have demonstrated the impact SES can have on general education as well as music education. According to Albert (2006a), administrative support is essential to the creation of a musically rich environment for students. Research suggests that SES might influence both the initial establishment of and the ongoing perception of a school's music program, which can possibly affect administrative support for the program (Albert, 2006a; Corenblum & Marshall, 1998). The research of both Corenblum and Marshall (1998) and Renfro (2003) found lower SES to be associated with lower administrative support. Albert (2006a) stated that administrative support "may be a factor in determining an instrumental music program's quality and accessibility" (p. 42).

Lack of administrative support for school music programs can result in lack of funding for these programs (Corenblum & Marshall, 1998; Hinckley, 1995), funding that is vital to the development of high quality music education (Albert, 2006a). Albert (2006a) stated "although instrumental music teachers direct learning activities, administrators and school districts create school support for instrumental music programs by deciding what resources will be allocated for them" (p. 42). Kozol (1991) and Renfro (2003) documented the inequalities in education, pointing to the poor quality or lack of facilities and equipment in lower SES situations due to lack of funding.

SES has also been found to be a predictor of parental support of school music programs, with low SES being associated with low parental involvement (Corenblum & Marshall, 1998; Renfro, 2003). The research of Hoover-Dempsey, Bassler, and Brissie (1987) found SES of the students in a school to be significantly correlated with parental involvement, attendance at parent-teacher conferences, parent home instruction, and parent volunteerism. Hinckley (1995) indicated that low SES parents are often not involved in their children's music programs due to work schedules or not feeling comfortable in the school environment. In addition,

> low SES parents may value school activities such as instrumental music programs, but the associated costs may prohibit their children from participating…Monetary investments necessary to participate in an instrumental program include obtaining and maintaining an instrument and purchasing supplies such as reeds, oil, strings, and sheet music (Albert, 2006a, p. 39).

Furthermore, SES may be related to the attitudes and circumstances of the students themselves. Corenblum and Marshall's survey (1998) of high school band members found SES to be a predictor of students' attitudes toward the band program. Lower SES was associated with more negative attitudes. Furthermore, sometimes students of low SES are limited in their ability to be involved with extra-curricular activities, such as music, due to the need to work after school (Renfro, 2003). Also, sometimes these

students don't have room in their school schedule for arts classes because they must take remedial classes (Renfro, 2003).

The teaching in low socioeconomic conditions is not always of a high quality (Kozol, 1991). Research has indicated that teachers often have lower expectations and standards for students in poorer schools (Hinckley, 1995; Kozol, 1991; Ogbu, 1974). Pre-service teacher training has not always adequately prepared teachers to teach in these settings (Fiese & DeCarbo, 1995), which are frequently understaffed and overpopulated (Hinckley, 1995). This may be why in Corenblum and Marshall's study (1998) of band students, students' perceptions of band teacher attitudes in lower SES settings were more negative. These difficult circumstances can lead to high teacher turnover in these low SES schools (Renfro, 2003).

SES may also be linked to general academic achievement. In DeHaan and Havighurst's study (1957), schools were ranked by the average SES of the students attending. The school with the highest SES had the highest achievers in both intellectual talent and artistic talent. Similarly, Stang's research (1955) found that gifted children (defined as those of high intelligence and high creativity) were more frequently found in homes of higher SES. In addition, this research demonstrated that gifted children of lower SES had problems realizing their potential. Furthermore, Nichols (2003) found SES to be the best predictor of the failure rate on the Indiana Graduation Exam.

The relationship between SES and achievement may extend to musical aptitude and achievement. In his study of students from grades 4 to 12, Rainbow (1965) found SES to be an important predictor of musical aptitude. The research of Dawkins and Snyder (1972) supported this idea with its finding that junior high students of lower SES scored lower on each test of the Seashore Measures of Musical Talent than the national norms. Likewise, the research of McCarthy (1980) demonstrated that SES accounted for differences in 5^{th} and 6^{th} grade students on an audiovisual music reading test and a performance sight-reading test, with those of lower SES scoring lower. In the same way, Daniels (1986) found that high school choir students who represented a higher socioeconomic bracket scored better on a sight-reading test. This study found that information about the SES of the school and the students had more impact on the results of the test than information about the chorus curriculum. Taebel and Coker (1980) found SES to be correlated with music achievement scores. Their research indicated that low SES students learned at about the same rate as others, but they started much further back.

Finally, researchers have found that SES may significantly impact school music program retention (Albert, 2006a; Corenblum & Marshall, 1998; Klinedinst, 1991; McCarthy, 1980). In fact, SES may be the best indicator of student retention for beginning instrumental students, more so than measures of academic achievement or musical aptitude (Klinedinst, 1991). Renfro (2003) theorized that this pattern of students quitting might be due to the high teacher turnover rate in these poorer schools.

Several strategies have been recommended for music educators in low SES situations. Corenblum and Marshall (1998) and Fiese and DeCarbo (1995) suggested that these teachers need better training. For example, Corenblum and Marshall (1998) advised that teachers should be given accurate expectations about the level of support they may receive from the school and parents in these economically disadvantaged areas. In addition, according to the urban music educators surveyed by Fiese and DeCarbo (1995), teachers must be taught how to deal with "the complex emotions of students from differing social and economic backgrounds" (p. 28). Furthermore, these music teachers

indicated that teachers should be prepared for the varying family situations which they may encounter in these schools, including single parent homes, custody battles, teen pregnancy, and students kicked out of their houses (Fieses & DeCarbo, 1995).

A number of sources have also promoted the importance of making the musical ensemble experience relevant to the lives of lower SES students (Albert, 2006b; Corenblum & Marshall, 1998; Fiese & DeCarbo, 1995). Corenblum and Marshall (1998) suggested that teachers realize that other programs in the school other than music may have a higher priority, and traditional band programs may not meet the needs of the students in these schools. They advised teachers to consider adapting their programs to be more sensitive to the racial/ethnic diversity of the school (Corenblum & Marshall, 1998). Albert (2006b) recommended forming alternative, culturally relevant ensembles to encourage students' involvement in band through music that is familiar to them. The urban music teachers in Fiese and DeCarbo's study (1995) suggested "teachers must find a way to relate to the students initially and then adapt the curriculum with that in mind" (p. 28).

Other proposed strategies that may be successful in low SES situations include giving students more ownership in the ensemble processes (Albert, 2006b; Fiese & DeCarbo, 1995), providing school-owned instruments (Albert, 2006b), creating a safe family environment within the program (Albert, 2006; Buford, 2010; Fiese & DeCarbo, 1995), building positive relationships between the teacher and students (Albert, 2006; Buford, 2010), maintaining teacher stability (Buford, 2010; Fiese & DeCarbo, 1995), and establishing high standards and accountability for all students (Buford, 2010; Hinckley, 1995).

The link between SES and general education and certain aspects of music education has been well documented. However, little research has explored the relationship between SES and music ensemble achievement in competition. Therefore, the purpose of this study is to look at the relationship between SES and bands' UIL Concert and Sightreading Contest ratings.

Method

The 2011 UIL Region 18 Band Concert and Sightreading Contests were chosen for this study because the competing bands represented a wide range of SES. The concert and sight-reading ratings for all high school and middle school ensembles (N = 173) were obtained from Texas UILforms.com, a publicly available website. The two ratings for each band (one for concert, one for sight-reading) were then averaged to create one composite rating for each band.

The percentage of economically disadvantaged students from each represented school was obtained from the 2009-2010 AEIS reports on the Texas Education Agency website. This was the most recent year for which this data were available. Data were not available for two schools, Ann Richards High School and Cedar Creek High School, because these schools opened after 2009. Therefore, these schools were not used in this study. The East Side Memorial High School band actually consists of students from two different campuses: East Side Memorial Global Tech and East Side Memorial Green Tech. The percentages of economically disadvantaged students from each of the two schools were averaged together for use in this study.

Results

Raw data consisted of the UIL ratings for each band and the percentage of economically disadvantaged students from each school. For computational purposes, schools were organized into four groups according to SES, with Group 1 being the poorest group and Group 4 being the least poor. Group 1 (n_1 = 27*)* consisted of schools with more than 75% of their students classified as economically disadvantaged. Group 2 (n_2 = 49) consisted of schools with greater than 50% but less than or equal to 75% of their students classified as economically disadvantaged. Group 3 (n_3 = 60) consisted of schools with greater than 25% but less than or equal to 50% of their students classified as economically disadvantaged. Group 4 (n_4 = 37) consisted of schools with 25% or less of their students classified as economically disadvantaged.

Data were analyzed by means of the Kruskal-Wallis One-Way Analysis of Variance, comparing UIL ratings with SES. Results indicated that there was a statistically significant difference in the UIL ratings of schools of different SES. The Kruskal-Wallis test documented the following result: H = (3, N = 173) 44.53, $p < .0001$. Dunn's Multiple-Comparison procedure was then computed. Significant differences in UIL ratings were found between all groups except Groups 2 and 3 and Groups 3 and 4.

Figure 1 shows the average UIL scores for the four groups. Recall that UIL ratings range from 1 to 5, with 1 being the highest rating.

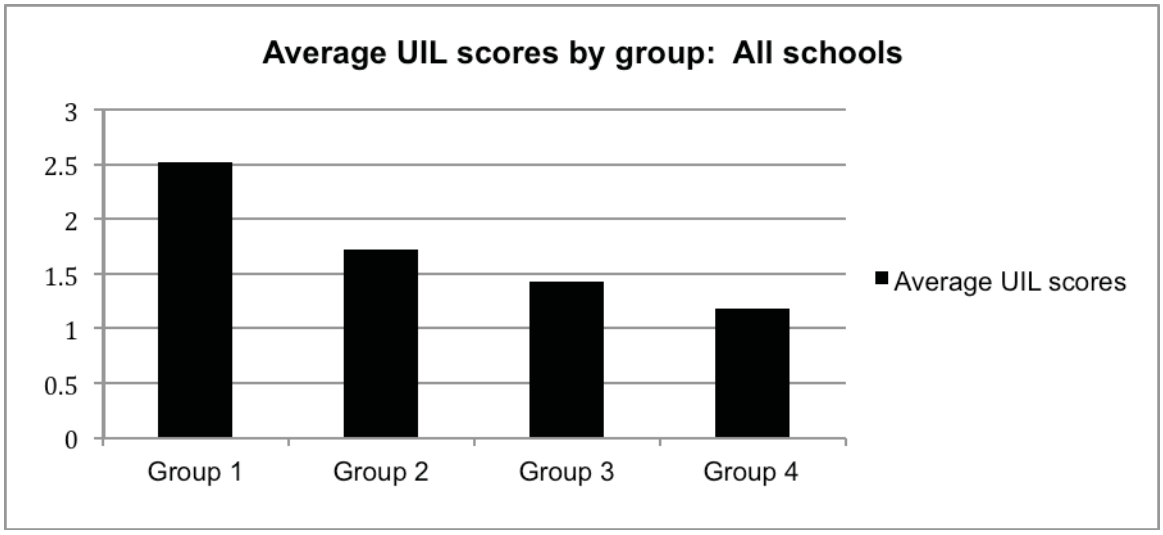

Figure 1. Average UIL scores for all schools by group. Group 1 is the poorest and Group 4 is the least poor.

A second Kruskal-Wallis test was computed for the middle school bands only. For this test, group sizes were: n_1 = 20, n_2 = 29, n_3 = 30, and n_4 = 18. Again, a statistically significant difference was found between the UIL ratings of schools of differing SES. The Kruskal-Wallis test documented the following result: H = (3, N = 97) 34.06, $p <$ .0001. Dunn's Multiple Comparison once again demonstrated significant differences

between all groups except Groups 2 and 3 and Groups 3 and 4. Figure 2 shows the average UIL scores for the middle school bands.

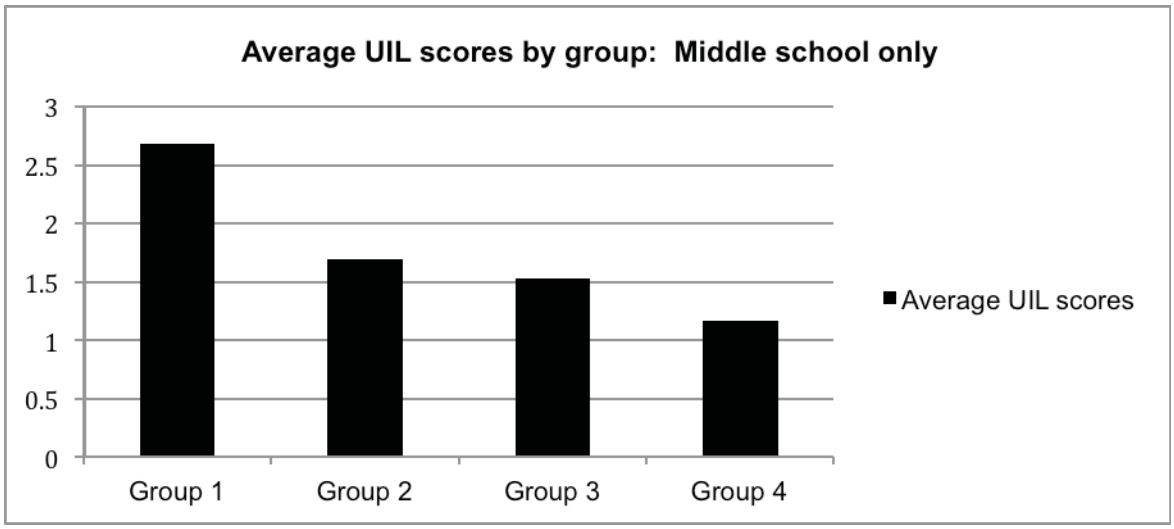

Figure 2. Average UIL scores for middle schools by group. Group 1 is the poorest and Group 4 is the least poor.

A Kruskal-Wallis test was then computed for the high school bands. For this test, group sizes were, $n_1 = 7$, $n_2 = 20$, $n_3 = 30$, and $n_4 = 19$. A statistically significant difference was found between the UIL ratings of schools of differing SES. The Kruskal-Wallis test documented the following result: H = (3, $N = 76$) 10.42, $p = .0153$. Using Dunn's Multiple-Comparison, the only significant difference was found between Group 1 and 4. Figure 3 indicates the average UIL scores for the high school bands.

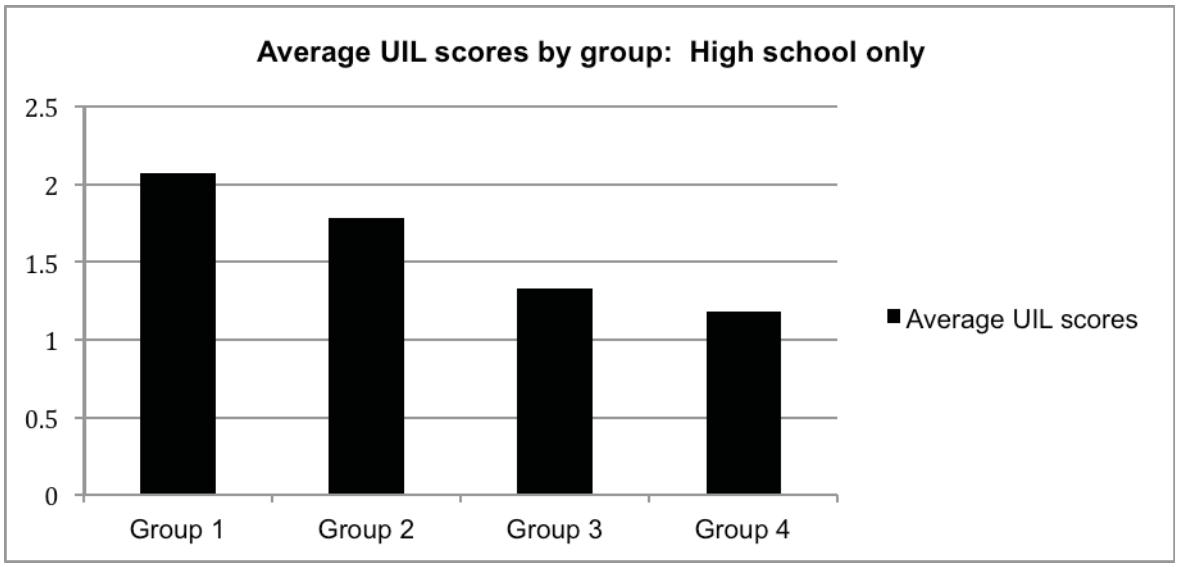

Figure 3. Average UIL scores for high schools by group. Group 1 is the poorest and Group 4 is the least poor.

Next, results for only the Varsity bands were analyzed. UIL has a procedure in place by which a band that is struggling can petition to compete at a lower level. For example, the top band from a particular school could petition to compete as a Non-varsity band rather than a Varsity band. According to the State Director of Music for UIL Richard Floyd (personal communication, January 17, 2012):

> Bands that have "fallen on hard times," [experienced] turn-over in teachers, [or faced] economic/social challenges that would have no hope of success at the varsity level have been allowed to enter as Non-varsity. This gives them the opportunity to participate and benefit from the Concert and Sight-reading at a realistic level where they might be able to have a better chance for success. They can stay at that level until they earn a Division I in Concert. At that point in time we assume that they are beginning to reestablish their program and they then go back to Varsity Competition.

For the purposes of this study, however, every top band was considered a Varsity band, every second band was considered a Non-varsity band, and so on. For this test, group sizes were, $n_1 = 19$, $n_2 = 27$, $n_3 = 35$, and $n_4 = 15$. As in the previous tests a statistically significant difference was found between the UIL ratings of schools of differing SES. The Kruskal-Wallis test documented the following result: $H = (3, N = 96)$ 26.37, $p < .0001$. Dunn's Multiple Comparison showed significant differences between Group 1 and 2, Group 1 and 3, and Group 1 and 4. However, no other significant differences existed. Figure 4 shows the average UIL scores for the Varsity bands.

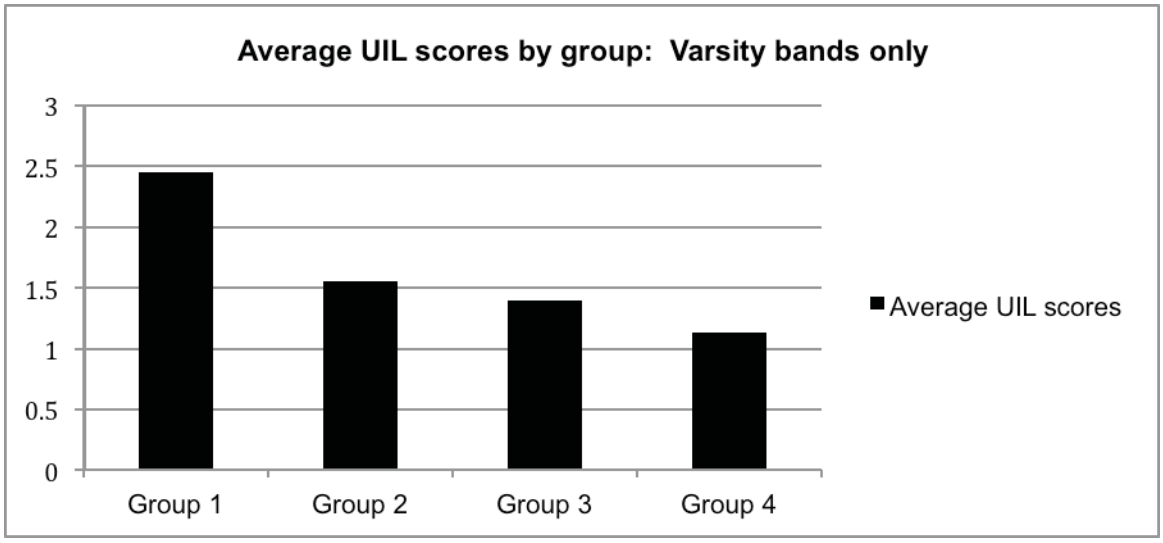

Figure 4. Average UIL scores for Varsity bands by group. Group 1 is the poorest and Group 4 is the least poor.

A final Kruskal-Wallis test was computed for all Non-varsity bands. For this test, group sizes were, $n_1 = 6$, $n_2 = 18$, $n_3 = 15$, and $n_4 = 11$. Again, a statistically significant difference was found between the UIL ratings of schools of differing SES. The Kruskal-Wallis test documented the following result: H = (3, $N = 50$) 19.59, $p = .0002$. This time Dunn's Multiple Comparison indicated significant differences between all groups except Group 1 and 2 and Group 3 and 4. Figure 5 indicates the average UIL scores for the Non-varsity bands.

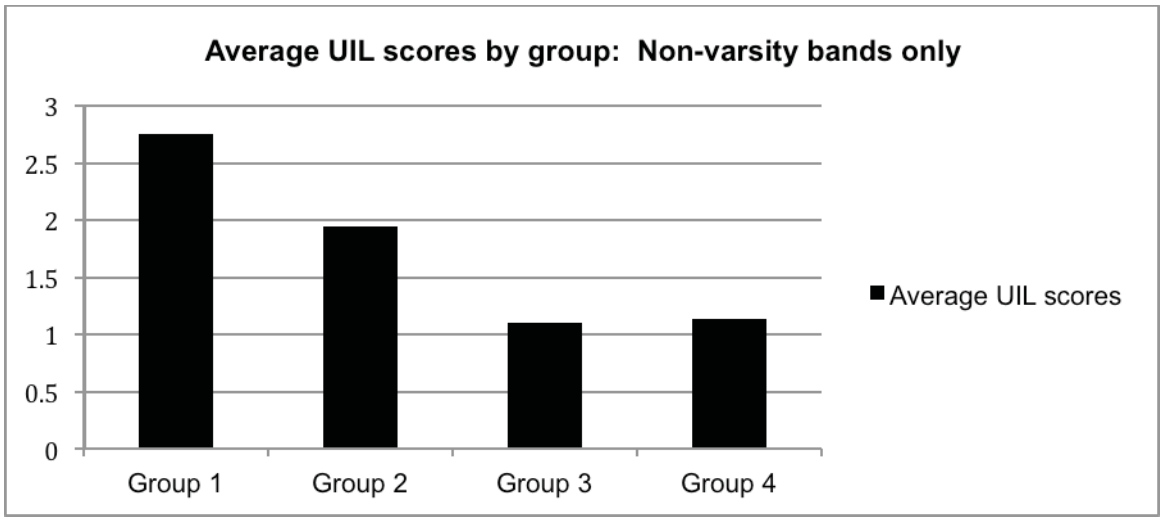

Figure 5. Average UIL scores for Non-varsity bands by group. Group 1 is the poorest and Group 4 is the least poor.

Although there were Sub Non-varsity bands, Sub Non-varsity B bands, and even one Sub Non-varsity C band that competed in the contests, these sample sizes were small. Consequently, additional Krukal-Wallis tests were not run for these bands.

Results may be summarized as follows: There was a statistically significant difference between the UIL ratings of schools of differing SES, with lower SES being associated with lower ratings. The difference was greater at the middle school level than the high school level, and it was greater for Varsity bands than for Non-varsity bands. The greatest differences occurred between the poorest schools (those with greater than 75% of their students classified as economically disadvantaged) and other schools.

Discussion

This study was designed to investigate whether school SES was related to bands' ratings at UIL. Results indicated that schools of lower SES received significantly lower ratings than those of higher SES.

When looking at all schools together, it can be seen that, although the ratings did gradually decline from the higher to poorer schools, these trends were not always statistically significant. This seems to suggest that extreme differences in SES relate to

UIL ratings, while smaller differences do not show a significant trend. It can also be seen that the largest drop-off in ratings occurs with Group 1, the poorest group.

The clearest relationships were found for middle school bands than for high schools bands. As discussed previously, research has shown SES to be a significant indicator of student retention in instrumental music programs (Albert, 2006a; Corenblum & Marshall, 1998; Klinedinst, 1991; McCarthy, 1980). It is possible that, as lower SES students choose not to continue with band at the high school level, the gap between band programs is closed to some extent. Additional research is needed to explore the differences between high school and middle school outcomes.

Analysis of the ratings of the Varsity bands only showed a large reduction in the ratings of the poorest schools. This trend was not seen in the analysis of the Non-varsity bands. This is most likely due to the fact that many of the very poorest schools, especially those with small or struggling band programs, do not have a Non-varsity band or do not have one that is viable to send to UIL Contest.

These results should be generalized with caution because these data were from one region in only one year. Further studies are necessary to see if these results can be applied to a broader population. Additional research into the link between SES and ensemble achievement in competition settings is warranted.

The findings of this study support the findings of previous research that low SES is often associated with low achievement (Daniels, 1986; Dawkins & Snyder, 1972; DeHaan & Havighurst, 1957; Nichols, 2003). It was not within the scope of this study to determine the causes of the differences in ratings for lower SES schools. It may be due to any of the factors discussed earlier which are associated with low SES, including lack of school and parent support, inadequate funding, low quality of teaching, lower teacher expectations, personal obstacles faced by the students, lower musical aptitude, and problems with retention. Furthermore, these low SES band programs may face limited access to private lessons, students frequently pulled out of rehearsals for academic remedial work, and large numbers of students academically ineligible to compete at UIL.

Further research is needed to isolate these variables to assess these differences in achievement. In addition, future research should look at very poor schools that experience consistent success at UIL. This would be useful in developing a model for a successful band program in a low SES situation.

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Sex-Types and Instrument Selection: The Effect of Gender Schemas on Fifth Graders' Instrument Choices

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Since the mid-1970s, music education researchers studied and followed musicians' and non-musicians' views of music instrument gender stereotypes and associations. The vast majority of studies focused on children, ranging in age from preschool through high school. Students' gender associations have changed little from 1978 (Abeles, 2009; Abeles & Porter, 1978). Researchers tried treatments such as having instrumental demonstrators of both sexes performing with varying degrees of success (Harrison, 2000; Killian & Satrom, 2011). Even with treatment, survey results suggested that children continue to stereotype instruments in the same way as their counterparts did a generation earlier (Abeles, 2009; Abeles & Porter, 1978; Eros, 2008). Researchers identified variables determining students' instrument selection and gender associations based on age, culture, and the influence of adults on the child. This research explored the causes of instrument gender stereotypes, the variables that cause stereotypes, and the treatments used to affect change.

To understand instrument gender stereotypes, one must first understand the difference between sex and gender and gender's role in society. Sex is often defined as biological, whereas, gender is defined as socially constructed (O'Neill 1997; Sinsel et al, 1997). Some argue against this broad definition, as they see sex and gender as synonymous, together creating a suite of traits that construct a person biologically and socially (Sinsel et al, 1997). Others find the gender definitions of masculine and feminine too constricting, as they do not allow an in between or androgynous trait (Sinsel et al., 1997). Bem (1983) proposed androgyny and undifferentiated as sex-types, in addition to high feminine-low masculine sex type and high masculine-low feminine sex-type, which is determined by self-scored characteristics on the Bem Sex Role Inventory. Bem proposed that cultural observations made by young children, coupled with their ability to encode and organize information, allows them to create gender-schemas, which includes gender roles and gender-appropriate activities.

Gender-appropriate activities include musical activities, such as what types of music to listen to, reaction to different types of music, and what types of instruments to play. The instruments most often associated with femininity are flute, clarinet, and oboe (high woodwinds) and the instruments most associated with masculinity are trumpet, trombone (brass), and percussion (Abeles, 2009; Abeles & Porter, 1978; Killian & Satrom, 2011). Saxophone is often considered

gender neutral and little research has utilized the French horn. It is unclear how and when gender associations with instruments began in the United States. Children consistently assign instruments to genders in the same manner as their parents (Abeles, 2009; Abeles & Porter, 1978). This leads some to believe that children are learning sex-type instruments from their parents and media (Abeles, 2009; Abeles & Porter, 1978; Fortney et al, 1993; Griswold & Chroback, 1981). This belief corresponds with Bem's (1983) gender-scheming theory of children observing, ordering, and creating gender-stereotypes based on what is modeled and said by their parents and other influential adults.

Influential adults, other than parents and close family members, may include band directors or demonstrators of instruments. Numerous studies have looked at the effect of demonstrator-gender on children with varying results (Harrison, 2000; Killian & Satrom, 2011). In her 2000 study, Harrison interviewed students at three middle schools for a baseline reading, and then held concerts at two of the three middle schools, one with gender-consistent models, one with gender-inconsistent models, and the third was the control with no models. Her findings suggested that both boys and girls were affected by seeing gender-inconsistent models, namely boys with the piano and flute, and girls with the trumpet or guitar. Other instruments, namely the drums, were unaffected by gender, with a majority of students preferring drums following the concerts, regardless of the model's gender. This suggests that the music played by the drummer (which was not controlled) affected the students' preference more than did the sex of the model.

In their 2011 study, Killian and Satrom had a similar study, in which they controlled the repertoire the demonstrating musicians of both genders played ("Twinkle, Twinkle Little Star", mid-range). The researchers detected a trend with many students changing their instrument preference following the concert; however, this trend yielded no significant difference in the statistical data, which the researchers attributed to the small sample size. Like Harrison (2000), Killian and Satrom recommended further research on the role of significant adults, especially parents, in student instrument preference.

The views of influential adults, such as parents, have not been studied since the seminal Abeles and Porter 1978 study. Band directors have been surveyed (Johnson & Stewart, 2004), with results suggesting that band directors were impartial to instrument gender associations; however, it is interesting that typically bands are grouped by gender associations (i.e. males are on low brass instruments, females are on high woodwinds), even if survey results suggest directors assign instruments based solely on physical characteristics, not gender. Why is there a difference? Is it because of band directors, students, parents, or a combination of the three?

This research aims to study the views of beginning band students and their parents, and if their opinions of music and gender affect their instrument selections. Do fifth graders select their instruments based on social perceptions? Are parents a dominant force in their child's decision on what instrument to play in band? Is the sex role of the student reflected in their instrument selection? Would parents support their child if they opted for a gender-inconsistent instrument? These questions were synthesized in two surveys, one for parents and one for students, which were completed during an instrument drive at a North Texas-area middle school. I hypothesized that this group of students would be more gender neutral, which would correlate with a gender-neutral band director and parents. Is this generation of new band students truly gender neutral, or is this middle school an exception to the norm, with other middle school students basing their instrument selections on gender guidelines placed on them by their parents and other outside influences that create their gender schemas?

Method

To determine the reasoning behind fifth graders' instrument selections and their corresponding sex-types, students (n =73) and their parents (n = 73) were given surveys when they arrived at the instrument selection nights at one intermediate school in North Texas. The school was chosen based on availability and the gender neutrality of its band director and instrument testers. Only one school participated in this study, as it is a pilot study. The selection nights were on two consecutive evenings in May 2011. The researcher was present at all times during the selection nights and all procedures protected the students' identities and their well-being.

When students and parents arrived at the event, they were given a three-page packet that contained both the parent and student surveys. They were told that the surveys were to study instrument drives in the North Texas area and would not be shared with the band director or affect their instrument assignments. Each survey was premarked with the participant number. Parents and students were prompted to take the survey prior to testing the instruments. The student survey was one page, with questions on the front and back. The questions were mostly closed-response questions, with the option of "other" for clarification. The student survey asked who helped the student in picking out their top three instruments and then asked why they selected each instrument. The final question asked if the student would refuse band if they had to play a specific instrument. An open answer follow-up question allowed students to state which instrument they would not play and why. The student survey is shown in Figure 1.

Student Questionnaire. Only to be filled out by the future band member.
There are no wrong answers. This questionnaire will not be used for your instrument assignment and will not be shared with anyone (it is confidential).

Please circle the answer that best fits you.

1. Sex:
   Male Female
2. Current Grade:
   5th 6th
3. Were you in band class with Mr. Taylor last year?
   Yes No
4. Have you selected the three instruments you most want to play for band?
   Yes No
5. If **yes**, who helped you select your top three instruments? Check who you think helped you the most.
   [Band Director} My Parents
   My Friends No one, I chose by myself
6. My top three instruments are (circle your top three):
   Bassoon Clarinet Euphonium Flute
   French Horn Oboe Percussion Saxophone
   Trombone Trumpet Tuba Other:_____

For the next questions, make sure to choose the **one** answer that bests describes you.

7. My first choice is _____ (please fill in) because:
   I like the sound. A family member plays it.
   My friends play it. I'm good at it.
   [The Director] made me. My parents made me.
   The instrument looks cool. The size of the instrument.
   Other_____
8. My second choice is _____ (please fill in) because:
   I like the sound. A family member plays it.
   My friends play it. I'm good at it.
   [The Director] made me.. My parents made me.
   The instrument looks cool. The size of the instrument.
   Other_____
9. My third choice is _____ (please fill in) because:
   I like the sound. A family member plays it.
   My friends play it. I'm good at it.
   [The Director] made me. My parents made me.
   The instrument looks cool. The size of the instrument.
   Other_____
10. I would not join band if I had to play an instrument I did not like.
    Yes No
11. If **yes**, what instrument(s) and why?
    _____

Figure 1. Student Survey

The parent survey was two pages, with questions on the front and back of both pages. Like the student survey, questions were closed-response with the option of "other" for clarification. The parent survey asked for the parent's and family's formal music background. Of particular interest are questions 13 through 29, a series of statements about their child's personality in order to gauge the child's sex-role. These questions were selected from Boldizar's *Children's Sex Role Inventory* (CSRI)(1991). The survey included five masculine items, five feminine items, and seven neutral items. The statements were in the order of: masculine trait, feminine trait, and neutral trait. Two additional neutral questions (#28 and #29) followed the last series in order to create an even number of questions. These answers were not counted in the final neutral score.

Parents were asked to circle one of four answers for their child: “very true”, “mostly true”, “a little true”, and “not true”. These answers would be scored on a four-point Likert-type scale of 4 for “very true”, 3 for “mostly true”, 2 for “a little true”, and 1 for “not true”. The questions were selected based on their perceived gender neutrality and positive connotations, in case parents were concerned about these answers affecting their child’s standing with their band director. The masculine, feminine, and neutral items were added and averaged separately to reveal the child’s masculinity, femininity, and neutral ratings. Questions 30 through 34 asked for the parent’s personal influence on their child’s instrument selection and if they would have reservations towards any instruments and why. The parent survey can be seen in Figure 2.

After both surveys were completed, parents and students returned the surveys to the researcher and proceeded to the band hall to test the instruments. The students were given a score sheet marked with their participant number. This score sheet listed all of the instruments available for testing. Students were scored on a scale of 1 to 10, with 1 representing least natural ability and 10 representing most natural ability. If testers were given a score in between two numbers, the score was rounded up post-testing. Percussion was an exception, as the students were rated from 1 to 10 in three categories (pulse, technique, rhythmic execution) and given an average score post-testing. After trying as many instruments as they wanted, the students selected their top two instruments. The band director then made instrument assignments based on the students’ scores and requests. The instrument assignments and scoring sheets were relayed to the researcher, providing all data for analysis.

Parent Questionnaire. Only to be filled out by a parent of the future band student.
There are no wrong answers. This questionnaire will not be used for your child's instrument assignment and is completely confidential.

Please circle the answer that best fits you.

1. Sex:
Male Female
2. Musical background:
Yes No
3. If **yes**, what instrument(s) did you play? Circle all that apply

Alto Sax	Bass Clarinet	Bass Guitar	Bassoon
Baritone	Baritone Sax	Cello	Clarinet
Drum set	Euphonium	Flute	French Horn
Oboe	Percussion	Piano	String Bass
Soprano Sax	Trombone	Trumpet	Tuba
Viola	Violin	Other:_____	

4. If **yes** for how many years (total)?
<1 1 2 3 4 6 7 8 9 10+

5. How many children do you have total? Note: if they're a dependent on your tax return, please count them.
1 2 3 4 5 6 7 8 9 10+
6. If you have more than one child, do any of your other children play an instrument in band, or did at one time?
Yes No N/A
7. If **yes**, what instruments did they play?
Child 1_____
Child 2_____
Child 3_____
Child 4_____
Child 5_____
8. Did you help them pick out their band instrument?
Yes No N/A
For the next questions, please circle the answer that best describes your child who is trying out for band today:
9. My child is a _____ child:
Oldest Middle Youngest Only
10. My child has had formal music lessons before this year.
Yes No
11. If **yes**, on what instrument (please list): _____

12. If **yes**, for how long (in total years)?
<1 1 2 3 4 5 6 7 8 9 10+
13. My child makes decisions easily.
Very True Mostly True A Little True Not True

14. My child is good at understanding other's problems.
Very True Mostly True A Little True Not True

15. My child enjoys helping others.
Very True Mostly True A Little True Not True

Figure 2. Continued on next page

16. My child likes to lead groups.
Very True Mostly True A Little True Not True

17. My child is loyal to their friends.
Very True Mostly True A Little True Not True

18. My child has many friends.
Very True Mostly True A Little True Not True

19. My child is self-reliant.
Very True Mostly True A Little True Not True

20. My child is shy around new people.
Very True Mostly True A Little True Not True

21. My child easily adapts to new situations.
Very True Mostly True A Little True Not True

22. My child makes a strong impression on people.
Very True Mostly True A Little True Not True

23. My child enjoys spending time with babies and young children.
Very True Mostly True A Little True Not True

24. My child is dependable.
Very True Mostly True A Little True Not True

25. My child is willing to take risks.
Very True Mostly True A Little True Not True

26. My child tries to comfort those who are hurt or feeling bad.
Very True Mostly True A Little True Not True

27. My child is serious.
Very True Mostly True A Little True Not True

28. My child is happy.
Very True Mostly True A Little True Not True

29. My child is honest.
Very True Mostly True A Little True Not True

30. I know the three instruments my child wants to play the most.
Yes No
31. I helped my child choose these three instruments.
Yes No
32. I am open to any instrument my child decides to play.
Yes No
33. If **no**, please list the instrument(s) you do not want your child to play.
_____
34. What are the reasons, if any, why you do not want your child to play the above instruments? Circle all that apply:
Sound Availability Ability Cost
Size Other_____

Figure 2. Parent Survey

Results

The data are taken from the responses of 73 beginning band students and their parents. All beginning band students were in the fifth grade at the same school. The sample was largely male, with 60% of responders (n = 44) identifying as male and 40% (n = 29) identifying as female. The

average results from students' *Children's Sex Role Inventory* (CSRI) can be seen in Table 1 (Boldizar, 1991).

Table 1

Average CSRI Scores by Sex

Sex	Average Score (out of 20)	Masculine	Feminine	Neutral
Male (44)		15	14.77	15.95
Female (29)		15.65	16.59	16.24
Total (73)		15.33	15.5	16.05

The male students' average masculine inventory score was 15/20 and their feminine score was 14.77/20. The little disparity between the masculine and feminine scores suggests that most of the males identified as high masculine-high feminine, also known as androgynous. Interestingly, the female students had a *higher* masculine score than their peers. Perhaps this is because there were fewer female students (n = 29) than male students (n = 44). Like their male counterparts, the females had both high masculine and feminine scores, which can be identified as androgynous.

The majority of students in this study identified as high masculine-high feminine. To determine the sex role of the student, I took their masculine and feminine scores and determined which was one was higher. If both were high, I determined whether the student was androgynous or only high masculine or high feminine if the disparity between the feminine and masculine scores was equal to or greater than three points. I determined whether a student was low masculine-low feminine (or asexual) if both of their scores were less than 10. Although no students were classified as asexual, there were two students who consistently had scores in the low teens in all categories. The number of students identified in each *CSRI* determined sex-role can be seen in Table 2.

Table 2

Sex-Roles by Sex

	High Masculine-Low Feminine	High Feminine-Low Masculine	High Masculine-High Feminine	Low Masculine-Low Feminine
Number of Males	5 (11%)	7 (16%)	31 (70%)	0
Number of Females	2 (7%)	7 (24%)	20 (69%)	0
Total	7 (9%)	14 (19%)	51 (70%)	0

It is apparent that sex and gender are truly different, as an equal number of males and females identified as high feminine-low masculine. The next question is whether these students identified

with gender-consistent instruments or if they did not identify instruments with gender. Tables 3.1, 3.2, and 3.3 address this.

On examination of these tables, it is clear that both girls and boys play both gender-consistent and inconsistent instruments. One of the most startling figures is the number of male students who play clarinet. Once considered a feminine instrument, the clarinet is clearly viewed by these students as androgynous. This claim is supported by the high number (n = 12) of androgynous students assigned to clarinet. The horn, which has been included in few previous studies, was also viewed as a gender neutral instrument, with six students testing as high masculine-high feminine, as compared to the two high masculine students and the one high-feminine student. It is of note that the saxophone, which is often regarded as a gender-neutral instrument was comprised of androgynous students; however, there were no females selected to play saxophone in the sample. This may be explained by how well the females who tried saxophones scored (the average score was 5.76/10).

Table 3.1
Sex and Gender Role by Instrument

Males

	Bassoon	Baritone	Clarinet	Flute	Horn	Oboe	Percussion	Saxophone	Trombone	Trumpet	Tuba
HM-LF	-	-	-	-	2	-	1	-	1	1	-
HF-LM	-	-	2	-	-	-	1	1	-	1	2
HM-HF	-	3	7	-	1	-	5	5	3	6	1
Total	0	3	9	0	3	0	7	6	4	8	3

Table 3.2
Females

	Bassoon	Baritone	Clarinet	Flute	Horn	Oboe	Percussion	Saxophone	Trombone	Trumpet	Tuba
HM-LF	-	-		-	-	1	-	-	-	1	-
HF-LM	-	-	3	1	1	-	1	-	-	-	-
HM-HF	1	1	5	2	5	2	3	-	1	1	1
Total	1	1	8	3	6	3	4	0	1	2	1

Table 3.3
Instrument by Sex-Type

	Bassoon	Baritone	Clarinet	Flute	Horn	Oboe	Percussion	Saxophone	Trombone	Trumpet	Tuba
HM-LF	-	-	-	-	2	1	1	-	1	2	-
HF-LM	-	-	5	1	1	-	2	1	-	1	2
HM-HF	1	4	12	2	6	2	8	5	4	7	2
Total	1	1	17	3	9	3	11	6	5	10	4

Note: HM-LF for high masculine-low feminine, HF-LM for high feminine-low masculine, and HM-HF for high-masculine-high feminine.

The trumpet, often viewed as a masculine instrument, was selected mainly by androgynous students (n = 7), as was the trombone (n = 4). Percussion also contains mostly androgynous students (n = 8), with one high-masculine student and two-high feminine students.

The instruments with the largest concentration of high feminine-low masculine students were flute, clarinet, and tuba, with over 33% of the students selected identified as *high feminine*. It is somewhat surprising that two students identified as high feminine play the tuba, which is often considered a masculine instrument. What's even more interesting is that these students are male, and the other male and female in the class identify as androgynous. The only instrument with 33% of students identifying as high masculine is the oboe, which is often considered a feminine instrument. The other two students surveyed identified as androgynous.

Interestingly, the instruments students tested or selected as their top three instruments did follow gender-consistent patterns. Figure 4 shows the instruments tested by sex.

Table 4

Instruments Tested by Sex

	Clar	Flute	Horn	Oboe	Perc	Sax	Trbn	Tmpt	Tuba	Bari
Male	21	10	31	19	21	28	33	34	27	31
Female	22	21	22	19	13	17	11	21	10	11
Total	43	31	53	38	34	45	44	55	37	42

Note. clar for clarinet, perc for percussion, trbn for trombone, tmpt for trumpet, and bari for baritone.

Figure 4 reveals that, although the majority of students are androgynous, they are more likely to test *sex-consistent* instruments. For example, 72% of female students tested the flute, but only 22% of males tested it. The same is true for students testing the trombone: 38% of females tested the trombone, compared to the 75% of males. The instruments that this sample of students identified as feminine are flute and oboe, and trombone, tuba, and baritone are considered masculine. These results are consistent with those of Abeles (2009), with upper woodwinds considered feminine and low brass considered masculine. Yet some results differ from Abeles' most recent study, in that instruments considered gender neutral are expanding. In addition to saxophone and horn, trumpet is no longer masculine and clarinet is no longer feminine. It is difficult to gauge the students' view on percussion, as that was only tested one day, which limited the sample size. This limited sample (n = 34), show that an equal percentage of males (48%) and females (45%) tested percussion, an instrument that may be more gender neutral than in the past.

One of the most fascinating parts of the student survey was students' reasons for choosing their top three instruments. The survey asked the students to choose one of nine reasons for choosing their instrument (see Figure 2): sound, family member plays it, friends play it, ability, director's choose, parent's choose, aesthetics of the instrument, size of the instrument, and other (an open question). The results may be seen in Figure 5.

Table 5

Reason for Choosing Instrument

	Sound	Family	Friends	Ability	Director	Parents	Aesthetic	Size	Other
First	36	7	3	16	-	1	3	1	-
Second	33	1	5	7	-	1	2	1	1
Third	29	6	2	3	-	3	5	2	1

Note. family/friends means a family member/friend plays the same instrument and director/parent means the students' director/parent made them choose the instrument.

It is clear that the overwhelming factor in student's decisions is not social but kinesthetic and aural. The sound of an instrument is the main reason why a student wants to play it, with their ability to play the instrument second (if students gave multiple reasons, only the first was chosen, which is why ability is significantly less than sound). It is only on the student's second and third choice instruments that social influence becomes a more prominent factor.

The students who responded to "other" were both male and female. The male student chose "other" and said he, "[wanted] to try something new" by playing the horn; however, he was assigned his first choice, the clarinet, for which he cited "sound" as the main influence. The female student who chose "other" wanted to play saxophone because it was, "[her] Mimi's favorite". Interestingly, the student did not test the saxophone, and was assigned her first choice, percussion, for which she cited "sound" and "ability" as her main influences.

Just as interesting as the reasons why students want to play specific instruments, are the instruments they would refuse to play. Students were asked if they would not join band if they had to play and certain instrument. Of the 66 students who did respond, 65% (n =43) of students were still, hypothetically, interested in band; however, the students who refused to play (n =23) certain instruments provide insight into their gender schemas and thinking. Two female and two male students refused tuba because of its size. Four females and two males would not play specific instruments (flute, clarinet, French horn, and saxophone) because of ability. One male student would refuse tuba because, "[he] didn't like the sound". Another male student would refuse clarinet because, "[sic] requires too much attention", which could be analyzed as his lack of ability or his lack of attention. Three male students listed instruments and cited no specific reason. These instruments were flute (2), oboe (2), bassoon, trumpet, percussion and baritone. As stated previously, flute and oboe are often described as feminine, which may be some of their reasoning. Another factor may be their ability (which could explain the lack of interest in baritone, trumpet, and percussion). Three other male students cited not being interested or not liking these instruments: flute (2), oboe (2), bassoon (3), and clarinet. All of the instruments the males listed may be categorized as feminine, which leads to the one student who did cite gender as a reason for not playing an instrument. One male student refused tuba and flute because, " [sic] they are too girly or it's too big".

Discussion

This pilot study revealed insights into instrument selection and gender. Fifth graders do select their instrument based on social perceptions; however, the social perceptions are changing and more instruments are considered gender neutral or androgynous. Parents were not the dominant

force in their child's instrument selection among children in this sample; rather, the sound of the instrument and the student's ability and early success were the key factors in these children's instrument decision-making process. The sex-role of the student was sometimes reflected in their instrument selection. With little significant difference among the four sex-types, most of the students tested as androgynous; yet, they viewed the majority of their instruments as androgynous, as demonstrated in the high number of males and females testing and playing clarinet, horn, oboe, percussion, and trumpet.

It should be noted that the Children's Sex Role Inventory ought to be viewed as a measuring tool that does not reveal everything about a student. Like any test that measures personality traits, it must be stressed that these children do not personify their sex-types; rather, the student sex-types help us better understand the student. For example, if a person takes a Myers-Briggs personality test and is identified as "idealistic-introvert", it does not mean this person is anti-social or cannot handle social settings, but simply enjoys time to alone, something that everyone needs and appreciates. The personality aspects of the Children's Sex-Role Inventory must be viewed in that same light.

To better understand how sex-role affects the instrument selection process, a large-scale study must take place. A greater sample would add depth to the pilot study, and should include different areas of North Texas, and possibly participants in other states. The future study also needs a larger sample of sex-role questions for the students or the students' parents to answer, which would be more effective at measuring a child's sex-type (and needs to include the reasoning process behind question selection.) This larger sample of questions should also include aspects of masculinity and femininity that could be perceived as negative, in order to better understand the student. The social, cultural, and economics of the school could possibly be a major factor in a child's gender schema and instrument selection process. The larger sample would also yield a diverse group of band directors and music educators, and if their gender-biases effect their student's instrument choices.

The information regarding why students choose their instruments could also become a study in and of itself. A longitudinal study that tracks children through band to see if their initial interest is maintained and, what factors affect a child's experience in band, both positive and negative. This would provide insight into why some students quit or become bored early in their music career.

The question persists of how and why musical instruments are given gender roles. When does this develop and, does it develop in their early listening? Is it possible to create a gender-neutral environment? If so, how would students then select instruments? Would it still be primarily based on sound and ability? This question, and others posed in this pilot study, can only be answered with further research in the field of instrument selection and gender stereotyping in fifth grade band students.

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