

A comparison of aural and visual instrument preferences of third and fifth grade students

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MacLeod, R. B. (2009). A comparison of aural and visual instrument preferences of third and fifth grade students. *Bulletin of the Council for Research in Music Education*, 179, 33-43. <http://www.jstor.org/stable/40319328>

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Abstract:

Instrument preferences of third and fifth-grade students ($N = 90$) were investigated for eight instruments commonly found in orchestra and band: flute, clarinet, saxophone, violin, cello, trumpet, French horn, and trombone. Participants were divided into two groups and asked to identify their favorite and least favorite instrument from a list of the eight instruments. One class each of third and fifth-grade students, Group A, listened to aural examples of the instruments and rated preferences for each instrument. The other two classes, Group B, rated pictures of each instrument. Overall ratings placed the eight instruments in the following order of preference: violin, flute, cello, saxophone, clarinet, trumpet, trombone, and French horn. A significant interaction between grade, gender, and instruments indicated little difference between genders in instrument preference at the third-grade level, but in fifth-grade, females preferred flute, violin, and cello more than males. No significant difference was found between the two methods of testing.

Keywords: instruments | elementary students | music education

Article:

Introduction

Recruitment and retention are essential to the development of a strong instrumental music program. Instrumental music classes are generally not required courses and students are frequently given the option to elect an ensemble and the instrument that they wish to play. Recruitment strategies should be carefully designed to increase retention and student satisfaction with consideration given to variables that influence student decisions. Researchers have found that instrument preferences and subsequent choices of students appear to be influenced by a number of variables including: instrument timbre (Delzell & Leppla, 1992; Fortney, Boyle, & DeCarbo, 1993; Johnson & Stewart, 2004; Kuhlman, 2005; O'Neill & Boulton, 1996; Schmidt &

Lewis, 1988), size and perceived difficulty of the instrument (Delzell & Leppla, 1992; Fortney et al., 1993; Kuhlman, 2005), and gender associations (Delzell & Leppla, 1992; Elliot & Yoder-White, 1997; Fortney et al., 1993; Griswold & Chrobak, 1981; Johnson & Stewart, 2004; Kelly, 1997; O'Neill & Boulton, 1996; Tarnowski, 1993).

Gender associations have been found for instruments both visually (Delzell, & Leppla, 1992; Fortney et al., 1993; Griswold & Chrobak, 1981; Johnson & Stewart, 2004; O'Neill & Boulton, 1996; Tarnowski, 1993) and aurally (Elliot & Yoder-White, 1997; Kelly, 1997). Music researchers have found that the harp, flute, violin, and clarinet are typically viewed as female, whereas drums, trombone, and trumpet are considered male (Abeles & Porter, 1978; Delzell & Leppla, 1992; Griswold & Chrobak, 1981; Kelly, 1997). Some investigations have established continua that rank the instruments from feminine to masculine. College students ranked the instruments in the following order: flute, violin, clarinet, cello, saxophone, trumpet, trombone, drums (Abeles & Porter, 1978). Over a decade later, Delzell and Leppla (1992) found almost identical results when college students were asked to label instruments as masculine or feminine; only the violin and clarinet reversed order in the continuum. Elliot and Yoder-White (1997) found that seven-, eight-, and nine-year-old children consistently perceived instrument timbres as masculine or feminine and ranked the instruments from female-nine to masculine in the following order: oboe, flute, clarinet, alto saxophone, trumpet, French horn, trombone, bassoon.

Instruments such as cello and saxophone remained in the center of the continuum and some research literature has found them to be perceived with less gender bias than the other instruments (Abeles & Porter, 1978; Delzell & Leppla, 1992; Kelly, 1997). The cello in particular has been labeled masculine (Kelly, 1997), feminine (Griswold & Chrobak, 1981), and neutral (Abeles & Porter, 1978; Delzell & Leppla, 1992).

Inconsistencies exist in research regarding the relationship between perceived instrument gender and instrument preference of male and female elementary students. Abeles and Porter (1978) studied the instrument preference of students from grades kindergarten through sixth and found that girls and boys both tended to choose instruments generally perceived to be more masculine than feminine. Delzell and Leppla (1992) found the majority of fourth-grade boys indicated a desire to play drums or saxophone while the majority of fourth-grade girls gravitated to flute, drums, saxophone and clarinet.

Previous research indicated that girls preferred both female and male instruments (Abeles & Porter, 1978; Delzell & Leppla, 1992), yet females continued to play typically female instruments (Zervoudakes & Tanur, 1994). Both males and females rated the saxophone as their favorite instrument, however 72% of the respondents who played saxophone were male and only 28% were female (Fortney et al., 1993).

The frequency of gender association with specific instruments has been found to increase with age (Tarnowski, 1993). A possible explanation for the discrepancy between instrument preference and final instrument selection of a student is the instrument preference or gender bias of the parent or guardian. When asked to choose an instrument for a hypothetical son or daughter, the participants preferred clarinet, flute, and violin for daughters, and drums, trombone, and trumpet for their sons (Abeles & Porter, 1978). Furthermore, in a survey regarding the instrument selection process, band directors indicated that they believed boys preferred trumpet, drums/percussion, and saxophone, while girls preferred flute, clarinet, and saxophone (Bayley, 2004).

Timbre preference or how an instrument sounds, has been identified through research as one of the most important factors in instrument choice (Delzell & Leppla, 1992; Fortney et al.,

1993; Johnson & Stewart, 2004; Kuhlman, 2005; O'Neill & Boulton, 1996; Schmidt & Lewis, 1988). In order to assess children's preference for a specific instrument without gender, familiarity, or predetermined bias affecting the student's choice, Gordon created the Instrument Timbre Preference Test using synthesized tones to represent flute, clarinet, saxophone/French horn, oboe/English horn/bassoon, trumpet/cornet, trombone/baritone/French horn, tuba/Sousaphone (Gordon, 1984). However, when college students and music faculty were asked to identify the instruments represented by the synthesized tones, few subjects correctly identified the timbre that represented saxophone/horn, oboe/bassoon, or tuba (Schmidt and Lewis, 1988.)

Kuhlman (2005) compared timbre preferences of fourth-grade students as measured by the Instrument Timbre Preference Test to the instrument choices of those students. A majority of the students did not demonstrate a timbre preference for the instrument that they currently played. Only 19% of the students who indicated the sound of the instrument as important to them chose to play the instrument for which they demonstrated a timbre preference, while 43% had a preference for an instrument other than the one they play.

In addition to timbre preference, other elements have been identified as key factors in instrument selection such as parental influence (Conway, 2000), size and difficulty of the instrument (Delzell & Leppla, 1992; Fortney et al., 1993; Kuhlman, 2005). Stated preference by students for specific instruments seems to contradict the trends in actual instrument choice (Fortney et al., 1993; Zervoudakes & Tanur, 1994). Geringer (1977) studied the operant preferences of three- to five-year-olds when given the option to play ten instruments and found inconsistency between verbal preference and amount of time spent playing that instrument. The timpani were played the most, but the ukulele was stated as the favorite instrument. The discrepancy between the stated favorite instrument and behavior of the participants suggests that discerning the preference of young students is a complicated process and perhaps not accurately assessed by simply asking young children what their favorite instrument is.

Students frequently state that they like an instrument because of its sound (Delzell & Leppla, 1992; Fortney et al., 1993; Johnson & Stewart, 2004; Schmidt & Lewis, 1988). However, the majority of research investigating instrument preference has utilized pictures of the instruments or interview techniques and has not included aural stimuli (Delzell, & Leppla, 1992; Fortney et al., 1993; Griswold & Chrobak, 1981; Johnson & Stewart, 2004; MacKenzie, 1991; O'Neill and Boulton, 1996; Tarnowski, 1993). Little research has directly explored the relationship between stated instrument preference and actual aural preferences of elementary age students (Kuhlman, 2005). Furthermore, the majority of instrument preference research has included primarily wind/band instruments and has not included string instruments.

The purpose of this study was to assess the instrument preferences of third- and fifth-grade students using aural and visual stimuli that included wind and string instruments. Instrument preferences of the students were gathered in relation to a printed prompt, visual stimuli and aural stimuli. Instrument preference was defined in terms of how much students would like to play the instrument. Preferences were compared on the basis of instrument, gender, grade level, and method or presentation (visual, aural).

Method

Participants

Participants were 100 third- and fifth-grade students in four elementary general music classes, two third-grade classes ($n = 49$) and two fifth-grade classes ($n = 51$) from a public school in an affluent neighborhood in the southern United States. Fifty-one of the participants were female and 49 were male. All classes were predominantly Caucasian (90%). All students attended general music class once a week. Each spring, the general music teacher completed a unit on instrument families and individual instruments with demonstrations and large pictures. The elementary school included both an orchestra and band program that begins in the fifth-grade and sixth-grade respectively.

Stimuli

Two tests were developed by the researcher to assess instrument preferences of participants. Both tests included the following instruments: trombone, trumpet, French horn, saxophone, cello, clarinet, violin, and flute. These eight instruments were selected to represent the instruments commonly found in beginning orchestra and band programs.

Test A was constructed using pictures of each of the eight instruments in order to assess preferences of the instruments through visual stimuli as had been done in previous research (Abeles & Porter, 1978; Delzell & Leppla, 1992). Each picture contained only that instrument and no person holding the instrument to eliminate additional gender associations. Appropriate images of instruments were located on the Internet at several sites and were edited, resized, and made as similar to each other as possible. All figures were black and white. See Figure 2 for an example.

Test B comprised eight aural examples of the same eight instruments used in the visual test. Eight university music majors played the eight instruments and were recorded performing two phrases of Ode to Joy in the key of B-flat major as close to middle C as possible to control for range differences. The violin and flute were both played in the second octave for a more accurate representation of characteristic sound and to eliminate additional confusion between the cello and violin. A model recording of the excerpt was played for each instrumentalist so that the articulation style would be consistent between performers. Recordings were made multiple times in order to produce a version that was as similar in style as possible to the model provided. I attempted to control for tempo (using a metronome), range, style, and dynamic level. Instruments that typically use vibrato (violin and cello) performed the excerpt with vibrato to produce a characteristic tone, while the remaining instruments performed without vibrato. The musicians were individually recorded with a condenser microphone connected directly to computer hard drive. Each recording was normalized so that intensity levels for each excerpt were identical.

A panel of 8 graduate instrumental music majors listened to the recordings to ensure that the instruments were characteristic in sound quality and that there were no discrepancies in performances. Each of the examples was identified correctly, affirmed as being representative in tone, and no stylistic anomalies were identified.

Recorded excerpts were approximately 20 seconds in length and placed on a compact disc in a random order and in reverse order. An interval of 20 seconds was placed between each example to allow response time. Total test length was approximately eight minutes.

Procedure

The researcher administered all tests. Prior to taking the test, the researcher explained that it was not a test, but a survey. Examples of food were used to describe preference and provided examples for strongly liking or disliking an item. For all conditions of the test, students were instructed to evaluate the instruments in relation to how much they would like to play that instrument.

A cover page was included with both tests that asked respondents to identify their gender, to name their favorite instrument, and to name their least favorite instrument. When selecting their favorite and least favorite, students were instructed to choose one of the eight instruments on the preference tests to facilitate additional comparisons between the rankings of the eight instruments.

One of the third-grade and one of the fifth-grade classes ($n = 50$) received Test A (visual assessment) and the other third and fifth-grade classes ($n = 50$) received Test B. Participants who received Test A (visual assessment), received the eight pictures and rating scales in a packet and were instructed to rate how much they liked or disliked that instrument. A rating of 1 corresponded to Do Not Like! and a rating of 7 corresponded to Like a Lot! The eight instruments were in a random order and then presented again in reverse order to help control for possible effects of presentation order. Students were given approximately 20 seconds to rate the instrument and then turn the page. Likewise, participants who received Test B (aural assessment) listened to the recordings of the eight instruments in random order and again in reverse order and were asked to rate the recordings on the same Likert-type scale from 1 to 7.

Results

Ten of the third-grade tests were eliminated from the study because subjects' responses were incomplete. A total of 90 tests were analyzed, 45 aural and 45 visual tests, of which 46 of the participants were female and 44 were male; 39 were third-grade students and 51 were fifth-grade students. Individuals' responses to each of the 16 experimental stimuli were analyzed using a four-way ANOVA with one within-subjects factor (instruments) and three between-subjects factors (gender, test format, and grade level).

A significant difference was found for the main effect of student instrument preference between the eight instruments ($F(7, 574) = 14.82, p < .001, r^2 = .15$). Overall ratings by the students placed the eight instruments in the following order of preference: violin, flute, cello, saxophone, clarinet, trumpet, trombone, and French horn. No significant difference was found for gender alone, however a significant instrument by gender interaction was found, as was the three-way interaction between instrument, gender, and grade, ($F(7, 574) = 3.59, p < .001, r^2 = .04$). Students rated individual instruments differently by gender in third- and fifth-grade. Third-grade girls and boys instrument preferences were similar, although girls rated the clarinet higher than boys ($M = 4.91$; $M = 3.85$, respectively), while the ratings in fifth-grade were noticeably different between genders, particularly for flute ($M = 5.38$, females; $M = 3.56$, males), violin ($M = 5.29$, females; $M = 3.79$, males), and cello ($M = 5.15$, females; $M = 4.17$, males) (see Figures 1a and 1b)

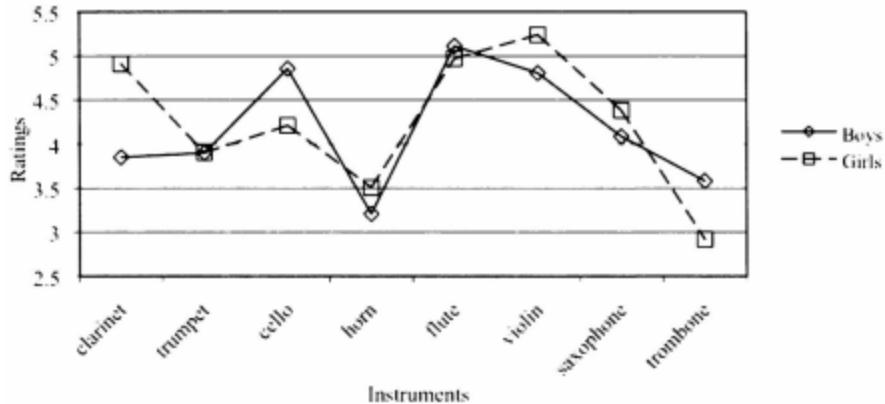


Figure 1a. Third-grade students' instrument ratings by gender

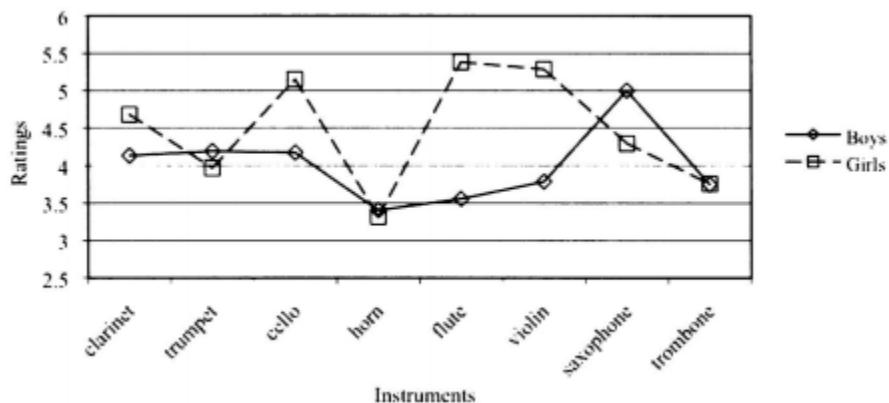


Figure 1b. Fifth-grade students' instrument ratings by gender

When asked to identify their favorite instruments, third-grade males and females both cited the violin most frequently followed by the flute. The least favorite instruments named by third-grade females were the cello, French horn, and trombone. Third-grade males identified their least favorite instruments as the French horn and flute. The favorite instruments listed by fifth-grade girls were the flute and violin. Fifth-grade boys overwhelmingly selected the saxophone as their favorite instrument. Least favorite instruments cited by fifth-grade females were the French horn, trombone, and cello. Least favorite instruments cited by fifth-grade males were the flute, violin, and horn (see Table 1).

Table 1 Stated favorite and least favorite instrument preference of third and fifth-grade students

Third-grade (n=39)	Favorite		Least favorite		Fifth-grade (n=51)	Favorite		Least favorite	
	Boys	Girls	Boys	Girls		Boys	Girls	Boys	Girls
violin	6	8	2	1		1	7	5	1
cello	1	0	2	6		1	3	2	6
flute	5	7	3	1		1	11	7	1
clarinet	1	4	2	1		2	1	3	0
saxophone	3	0	2	3		14	2	1	1
trumpet	2	2	1	0		3	0	2	2
French horn	0	0	4	4		1	1	4	9
trombone	0	0	2	5		3	0	2	5

Initial student responses that named their favorite instrument and least favorite instruments were compared to their ratings of the instruments to determine whether stated instrument preference corresponded to rated preference. Results showed that third-grade students' ratings of the pictures corresponded to their stated favorite instrument 70% of the time and their least favorite instrument 40% of the time. Third-grade students' ratings of the aural stimuli corresponded positively 32% of the time for both stated favorite and least favorite instrument. Fifth-grade students' ratings of the pictures corresponded to their stated favorite instrument 80% of the time and to their least favorite instrument 76% of the time. A comparison between the stated and aural rating of that instrument corresponded positively 56% of the time between for the favorite instrument and 54% of the time for the least favorite instrument.

Discussion

Analysis found significant differences in the students' ratings of the eight instruments, although ratings of instruments interacted with both gender and grade level. No significant difference was found between the aural and visual methods of testing.

Third-grade females rated the instruments in the following order: violin, flute, clarinet, saxophone, cello, trumpet, French horn, trombone and third-grade males rated the instruments: flute, cello, violin, saxophone, trumpet, clarinet, trombone, and French horn. These findings conflict with results from previous gender studies where both girls and boys seemed attracted to more masculine instruments (Abeles & Porter, 1978; Delzell & Leppla, 1992; Fortney, Boyle, & DeCarbo, 1993). The third-grade students in this study seemed to prefer predominantly female instruments in all three types of assessment. Violin and flute were rated in the top two to three

visually, aurally, and named by both males and females as their favorite instruments in third-grade.

A difference in gender was found for the fifth-grade students' ratings of the eight instruments. In the fifth-grade, girls rated the flute, violin, and cello much higher than boys who rated only saxophone higher than girls. These results suggest that by the fifth-grade, typical instrument biases are more prevalent. The most dramatic change in preference was found in the ratings of third-grade and fifth-grade boys. Flute dropped from number one in third-grade to number seven among boys in the fifth-grade and the saxophone was the highest rated instrument by fifth-grade boys (see Figure 1a and 1b). This finding corroborates previous research that girls' favorite instrument is the flute and boys' favorite instrument is the saxophone (Delzell & Leppla, 1992).

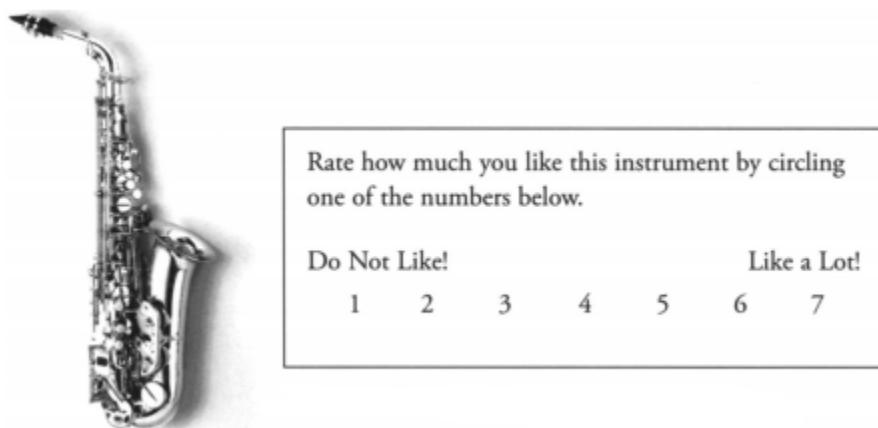


Figure 2. Example of the instrument rating form.

Previous research found that string instruments were the least favorite instrument to play (Abeles & Porter, 1978). This research found that violin and cello were rated first and third overall by the students. The method of assessing a student's favorite instrument may be partially responsible for this discrepancy. A comparison of stated versus rated responses that identified favorite and least favorite instruments produced low rates of agreement. Results showed that when third-grade students were viewing pictures of the eight instruments, their ratings of the pictures corresponded to their stated instrument of choice 70% of the time. Fifth-grade students' stated preference corresponded to the rating of the picture 80% of the time. However, third-grade students' ratings of the aural examples corresponded only 32% of the time to the stated instrument of choice and fifth-grade ratings of the aural examples corresponded only 52% of the time to the stated instrument preference.

Further research is needed to determine why such a discrepancy existed between the stated instrument preference and ratings of both picture and aural examples of the instruments. It is interesting that there was a higher correlation between the stated instrument preferences and pictorial examples than between the stated preference and aural examples. One possible explanation is that students were more familiar with the visual aspects of the instruments than they were with aural aspects. It is also interesting that the fifth-grade students' stated responses to favorite instrument correlated higher to ratings of both aural and pictorial examples of the

instruments than the third-grade responses. This also seems to imply that the fifth-grade students were more familiar and had more experience with instruments than did third-grade students.

These findings suggest that discerning a young student's preference is not as simple as asking him to state his favorite instrument or aural preference. Students frequently identify the sound of an instrument as their reason for liking that instrument, yet in this study, students often did not rate the sound of their stated instrument as their favorite. It is possible that students are simply not familiar with all aspects of the instruments: sound, appearance, and name. Furthermore, the majority of research investigating instrument preference has focused on instruments typically found in band. Further research that includes more instruments and variables would help clarify elementary students' instrument preference and facilitate recruiting procedures for orchestra and band programs.

Accurate identification of student instrument preference may yield increases in recruitment as well as retention in band and orchestra programs. Young children have limited access to music education in many schools where music is frequently provided as a special meeting only once or twice a week. Although not supported in this study, if the sound of an instrument is an influential factor in instrument preference and instrument choice as suggested by previous research (Delzell & Leppla, 1992; Fortney et al., 1993; Johnson & Stewart, 2004; Schmidt & Lewis, 1988), then educating students about instruments visually and aurally could have an effect on their instrument choice. Based on the results found in this study, teaching names, sounds, and appearances, prior to instrument selection seems prudent.

Caution is advised when interpreting the results of this study. Students from only one school participated in this study with only eight possible instruments. Numerous environmental factors could have influenced the preferences of the students including: socio economic status, curriculum, music teachers, parents, ethnicity, and community. Further research that investigates aural and visual instrument preferences in a variety of school districts would contribute to our understanding of instrument preference and would be useful information in recruiting and retaining students.

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