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Kristyn Kuhlman
Rowan University

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The Impact of Gender on Students' Instrument Timbre Preferences and Instrument Choices

by
Kristyn Kuhlman
Rowan University

When investigations of instrument preferences include actual music instrument timbres and labels, research reveals that gender stereotyping of instruments influences a respondent's choice. The primary purpose of this study was to examine timbre preferences in relation to the student's gender using synthesized sounds rather than natural instrument timbres. A secondary purpose was to examine students' subsequent choices of instruments in relation to their timbre preference and gender. Gordon's Instrument Timbre Preference Test (1984) was administered to 632 third-grade students. Boys (n = 312) most frequently preferred the oboe, English horn, and bassoon timbre (35.6%), followed by tuba (27.2%) and flute (24.8%); least preferred timbres were trumpet and trombone/baritone. Girls (n = 320) most frequently preferred the flute timbre (39.6%), followed by double reeds (24.8%) and saxophone (24.8%); least preferred were low brass timbres.

In fourth grade, the instrument choices of 232 of these students were examined. Results indicate that even though boys' timbre preferences did not conform to typical instrument gender associations, their instrument choices do: 83% of all boys (n = 117) chose to play the saxophone, trumpet, or trombone, yet only 28% demonstrated a preference for these instruments. Nearly 80% of all girls (n = 115) chose to play the flute or clarinet, yet only 40% preferred these timbres. These results support the hypothesis that students ultimately tend to choose instruments according to gender-stereotypes rather than demonstrated timbre preference.

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Associating musical instruments with specific genders is a common sociological phenomenon in American culture. Research in music education indicates that this gender stereotyping of music instruments is consistent across age and grade levels, that is, specific instruments are consistently identified as masculine or feminine regardless of subjects' ages. In a study conducted by Abeles and Porter (1978) examining the masculine and feminine association of musical instruments, the researchers administered a survey to 58 university students, 32 of whom were music majors. The survey listed all possible pairs of the eight musical instruments typical to most beginning instrumental programs. The students were asked to indicate which instrument in each pair they considered to be more masculine, their answers resulting in the following masculine to feminine continuum: drums, trombone, trumpet, saxophone, cello, clarinet, violin, flute. These findings were confirmed in a study by Griswold and Chrobak (1981) who expanded the number of instruments studied and included the categories of 'choral conductor' and 'instrumental conductor.' College students, 40 of the 89 identified as music majors, were asked to rate each instrument as more masculine or more feminine using a 10-point Likert scale. The harp was rated as most feminine, followed by flute, piccolo, glockenspiel, choral conductor, cello, violin, clarinet, piano, french horn, and oboe. Tuba was rated as the most masculine, followed by string bass, trumpet, bass drum, saxophone, instrumental conductor, cymbal, and guitar.

A second study by Abeles and Porter (1978) examined the extent of musical instrumental gender-stereotyping in adults. Respondents were 149 adults ranging in age from 19 to 52 who were asked to answer the following hypothetical questions: "Your fifth grade daughter has indicated in a school survey that she would like to play a musical instrument" and "Your fifth grade son has indicated in a school survey that he would like to play a musical instrument." Respondents were asked to indicate from among eight instruments (cello, clarinet, drums, flute,

saxophone, trombone, trumpet, and violin) the three instruments that they would encourage their son and daughter to select. Results indicated that respondents preferred clarinet, flute, and violin for their daughters, and drum, trombone, and trumpet for their sons. Because parents are identified as one of the strongest influences on a student's choice of instrument (Fortney, Boyle, & DeCarbo, 1993; Gordon, 1984; Sloboda & Howe, 1992), it can be concluded that parental gender stereotyping of instruments impacts students' instrument choices.

For the purpose of examining students' instrument choices, Abeles and Porter (1978) presented eight instruments to 598 students in kindergarten through fifth grade and asked students to select the instrument they would most like to play if they had the opportunity. To ensure that the students were familiar with the eight instruments, the students saw a large poster of each instrument and heard a recording of each performing an identical composition. After hearing and seeing each instrument, children were instructed to circle the name of the instrument that they would most like to play. The researchers found that the boys' selections remained relatively stable at the masculine end of the scale from kindergarten through fifth grade. The girls' selections moved toward the feminine end of the scale, stabilizing around the third or fourth grade. In response to this study, Delzell & Leppla (1992) conducted a study to determine what, if any, changes in gender association occurred as a result of the increased sensitivity during the late 1970s and early 1980s to issues related to gender stereotyping and discrimination. Over 500 fourth-grade students were asked to indicate which of eight listed instruments would be their first choice to play and which would be their second choice. A poster of each instrument was visible to the subjects and instrument names were written adjacent to the posters for subjects' constant reference. The responses for boys were limited, the majority wanting to play drums or saxophone (combined 83%); girl's choices were somewhat broader and included flute, drums,

saxophone, and clarinet. A chi-square analysis indicated that choices made by boys and girls were significantly different, with the researchers concluding that preference is related to gender. In addition, it was observed that the saxophone had gained greater popularity among both genders.

In order to determine factors that influence students' instrument choices, Fortney, Boyle, and DeCarbo (1993) surveyed over 900 instrumental music students from 13 middle schools. The questionnaire required students to rate the influence of several factors such as parents, friends, and the sound of the instrument on their choice. Although 51% of the survey respondents indicated that the most influential factor on their instrument choice was the sound of the instrument, Fortney, Boyle and DeCarbo found that regardless of what students say in response to questions about the influence of various factors, males ultimately tend to choose to play instruments that are considered masculine, and females tend to choose to play instruments that are considered feminine. The authors reported that 90% of the ninth-grade flutists were female while nearly 90% of the trumpet players and percussionists were male. More than 70% of clarinet and oboe players were female whereas 72% of the saxophone players were male. In addition, the researchers reported that the large majority of low brass players were male. Abeles and Porter (1978) also suggested that the strong instrument gender association may be the dominant factor in instrument selection, and in a survey of 249 instrumental music teachers, Bayley (2000) found strong agreement among music teachers regarding the influence of gender-stereotyping on students' instrument choices.

Instrument Timbre Preference Test

The Instrument Timbre Preference Test (Gordon, 1984) includes seven synthesized timbres, each timbre created and performed using a Moog Opus 3 Synthesizer. Each of the derived synthesized timbres is intended to represent the timbres of the following brass and woodwind music instruments:

Timbre A	Flute
Timbre B	Clarinet
Timbre C	Saxophone and French Horn
Timbre D	Oboe, English horn, and Bassoon
Timbre E	Trumpet and Cornet
Timbre F	Trombone, Baritone, and French Horn
Timbre G	Tuba and Sousaphone

According to Gordon, one of two or more synthesized timbres may not be the more representative of the same actual instrument (french horn), and one synthesized timbre may be representative of various unrelated actual instruments in terms of instrument register (saxophone and french horn).

The seven timbres are organized into 42 recorded test items: each of the seven timbres is paired twice with every other timbre. A student listens to each test item and indicates which one of the two timbres he prefers. Because the melody is the same and the musical expression held constant for every timbre, Gordon maintains that timbre is the only factor that changes in each test item. A student hears each of the seven timbres twelve times throughout the test and if he chooses a timbre at least ten of the twelve times, he is considered to have a preference for that timbre. According to Gordon, it is possible for a student to demonstrate a preference for as many as four timbres, yet it is also possible for a student to not demonstrate a preference for even one timbre. Gordon stated that if a student demonstrates a timbre preference for both C and F, the student should be encouraged to study the french horn.

In the *ITPT* manual, Gordon defended the use of synthesized sounds rather than the sounds of actual instruments using the following rationale:

- (a) It is not possible to perform a melody on different instruments with identical musical expression and it was found that students attend to and base their preferences on the quality of the musical expression rather than the performance.
- (b) While it is not feasible to include all actual instrumental timbres on the test, a synthesized sound may represent more than one instrumental timbre.
- (c) Students who demonstrate a preference for a given synthesized timbre may be given a choice of instruments to study.
- (d) Students may claim to prefer a timbre performed on an actual instrument only because they are familiar with the instrument itself, or may actually reject a timbre based on an unfortunate experience with the instrument.
- (e) Students may claim to prefer the timbre of an actual instrument because the instrument is associated with female or male performers, because a famous artist plays that instrument, because one of their relatives or friends plays the instrument, or because the instrument is associated with a favorite piece of music (or music video for today's students).

Gordon's final rationale concurs with the theoretical model of variables which may contribute to an individual's music decision-making process proposed by LeBlanc (1982). According to his model, these ranked-order variables influence students' instrument choices: (a) media, (b) peer group, (c) family, (d) educators and authority figures, (e) incidental conditioning, (f) physical properties, and (g) performance quality.

Gordon reported that although there are limitations in the use of synthesized sounds, a majority of the criterion-validation sample identified each synthesized timbre with at least one of the instruments that it was intended to represent. His sample was comprised of 186 music professors, music supervisors, music teachers, and university band members. Contrary to Gordon's findings, Schmidt and Lewis (1988) did not find that a majority university music

majors and professors perceived each of the timbres to be very good likenesses. They did find that 85% or more of the sample indicated that Timbres A, B, and E represented flute, clarinet, and trumpet respectively, and 61.4% felt that Timbre F was representative of horn, trombone, and baritone. However, they also found that few subjects appropriately identified the instruments associated with Timbres C, D, and G. In fact, only 28% of the sample associated Timbre C with a representative instrument, and only 24.6% associated Timbre D with a representative instrument.

Weaver (1987) conducted a comprehensive study to compare the reliabilities of the nine natural instrument timbre subtests of her self-created Timbre Preference Measure (TPM) to the synthesized timbres of the *ITPT*. She administered the tests one week apart to over 300 students in fourth, fifth, and sixth grade. The TPM used the same melody and item format as the *ITPT*. Correlations between the natural timbres and synthesized timbres ranged from .50 - .59, from which the researcher concluded that there is not a substantial relationship between preference for natural music instrumental timbres and synthesized timbres as represented in the *ITPT*.

The findings by Schmidt and Lewis (1988) and Weaver (1987) suggest that the synthesized timbres of the *ITPT* may not adequately represent the natural instrument timbres, which they are expressly intended to represent. Although possessing limited criterion-related validity, the *ITPT* is the only standardized timbre preference test that does not make use of actual instrument names or timbres. Because a respondent chooses preferences from among synthesized sounds with no knowledge of the specific instruments represented by the sound, a respondent's demonstrated timbre preference may more accurately reflect his or her true instrument preference free of gender-association bias. The studies previously described examined the gender association of

musical instruments by asking subjects to respond to the sound or name of the actual musical instruments. An inherent weakness of using actual instruments to examine instrument timbre preference is that there is no way to determine the degree to which gender-stereotyping influences students' preferences for instrument timbres. The primary purpose of this study, therefore, was to examine timbre preferences in relation to the student's gender using synthesized sounds rather than natural instrument timbres. A secondary purpose was to examine students' subsequent choices of instruments in relation to their timbre preference and gender. Specific research questions to be addressed were:

1. Will students' timbre preferences follow gender patterns found in previously conducted research when synthesized sounds are used instead of natural instrument timbres?
2. To what degree do students' choices of instruments correspond to the instruments for which they demonstrated a timbre preference?

Procedure

Subjects (n = 632) consisted of third-grade students from five elementary schools in a large school district in southern New Jersey. The reported make-up of the student body is approximately 91% Caucasian, 5% African American, 3% Asian, and 1% Hispanic. The *ITPT* was administered to all third-grade students in the district at the end of the school year as part of their regular general music classes. The test was administered before students registered to participate in the beginning instrumental program the following year and before they expressed their preferred instrument choice. All tests were hand scored by the researcher according to the procedures outlined in the manual (Gordon, 1984). Thus, if a student chose a timbre 10 or more times, the student was considered to have a preference for that timbre.

To answer the second research question, information for those students who participated in the beginning instrumental music program upon entering fourth grade was made available to the researcher by the elementary instrumental music teachers in the early months of the following school year. The beginning instrumental program is open to all students in fourth grade with instrument choices limited to flute, clarinet, alto saxophone, trumpet, trombone, baritone, and percussion. Neither students nor beginning instrumental music teachers were aware of results of the *ITPT* for the purpose of further research.

Results

Gordon (1984) states that in most groups, approximately 75% of students demonstrate a timbre preference. Of the 632 students in the current study, 64% (n = 404) students demonstrated a timbre preference. Of the 312 boys, 202 boys demonstrated a preference for at least one timbre: 48 of those boys preferred multiple timbres. Table 1 provides data for boys who indicated a timbre preference. Results of the *ITPT* reveal the most frequently preferred timbre among the boys was Timbre D (35.6%), followed by Timbre G (27.2%), Timbre A (24.8%), Timbre C (22.7%), Timbre B (11%), Timbre E (6%), and Timbre F (3%).

Of the 320 girls, 202 girls demonstrated a preference for at least one timbre: 53 of those girls preferred multiple timbres. Table 2 provides data for the girls who indicated a timbre preference. Results of the *ITPT* reveal the most frequently preferred timbre among the girls was Timbre A (39.6%), followed by Timbre D (24.8%), Timbre C (24.8%), Timbre B (18.3%), Timbre E (11.4%), Timbre G (7%), and Timbre F (3%).

Table 1
Frequency of timbre preferences for boys (n = 202)

Timbre	Instruments	Percentage	n
D	oboe, English horn, bassoon	35.6%	72
G	tuba and sousaphone	27.2%	55
A	flute	24.8%	50
C	saxophone, French horn	22.7%	45
B	clarinet	11%	22
E	trumpet and cornet	6%	13
F	trombone, baritone, French horn	3%	7

Table 2
Frequency of timbre preferences for girls (n = 202)

Timbre	Instruments	Percentage	n
A	flute	39.6%	80
D	oboe, English horn, bassoon	24.8%	50
C	saxophone, French horn	24.8%	50
B	clarinet	18.3%	37
E	trumpet	11.4%	23
G	tuba and sousaphone	7%	14
F	trombone, baritone, French horn	3%	7

In the school year following the administration of the *ITPT*, scores were available for 232 students who participated in the beginning instrumental program and were learning to play a wind instrument. Of the 232 students, 117 were boys and 115 were girls. Data was examined for the purpose of examining students' instrument choices in relation to timbre preferences as measured by the *ITPT* and gender. Table 3 provides a comparison of the percentage of boys and girls who demonstrated a timbre preference for a particular instrument to the percentage of boys and girls who elected to study that instrument. The data reveals a discrepancy between demonstrated timbre preference and instrument choice, an analysis of which suggests a weak

relationship between students' timbre preferences and subsequent instrument choices ($r = .24, p > .05$).

Table 3

Comparison of students' timbre preferences to instrument of choice by gender (n = 232)

Instrument	Timbre Preference	Instrument of Choice
FLUTE		
Boys	14.5%	6%
Girls	23.5%	44.3%
CLARINET		
Boys	9.4%	11%
Girls	15.7%	36.5%
SAXOPHONE		
Boys	18.8%	41%
Girls	23.5%	5.2%
TRUMPET		
Boys	6%	26.5%
Girls	7%	7.8%
TROMBONE		
Boys	3.4%	15.4%
Girls	3.5%	6.1%

For example, although 14% of the boys demonstrated a preference for flute, only 6% of the boys elected to study the flute. On the contrary, only 21% of the girls demonstrated a timbre preference for flute, yet over 43% of the girls elected to study flute.

Of the 232 students, only 37 (16%) of students chose to play instrument for which they demonstrated a timbre preference. Of those 37 students, 27 are girls who play the following

instruments: flute, n = 14; clarinet, n = 10; trumpet, n = 1; saxophone, n = 1; trombone, n = 1.

Instrumentation for the 10 boys who chose to study instruments for which they demonstrated a timbre preference is as follows: saxophone, n = 6; trumpet, n = 2; clarinet, n = 1; flute, n = 1.

Conclusion

The primary purpose of this study was to determine if students' timbre preferences follow gender patterns found in previously conducted research when synthesized sounds are used instead of natural instrument timbres. Regarding this first research question, results of the study indicated that when the students have no knowledge of actual instrument names and are presented with synthesized sounds rather than natural instrument timbres, their preferences for instruments do not follow typical gender association patterns. In this study, one out of every three boys (35.6%) demonstrated a preference for Timbre D (representing the oboe, English horn, and bassoon). None of these instruments were presented as potential instrument choices in any of the previously completed studies, therefore this result does not contradict or confirm previous gender stereotypes of these instruments. Timbre G (representing the tuba and sousaphone) was the next most preferred timbre (27.2%), this result supporting the findings of previous gender-stereotyping research by Griswold and Crookback (1981). In contrast to studies of gender stereotyping, the third most frequently preferred timbre of the seven was Timbre A (representing the flute), which was preferred by 24.8% of the boys. Also in contrast to gender-based preference studies, the two timbres least frequently preferred among boys were Timbre E (representing the trumpet), which was preferred by 6% of the boys, and Timbre F (representing the trombone, baritone, and french horn), which was preferred by 3%. These results are in fact opposite to those found in studies in which boys were asked to select their preferred instrument from a list of actual music instruments. These data supports the hypothesis that boys' stated instrument choices

are strongly influenced by gender-stereotyping bias and may not accurately reflect their true timbre preferences.

Frequency of timbre preferences demonstrated by girls in this study were comparable with those found in previously conducted research. Timbre A (representing the flute) was the most frequently preferred timbre, preferred by 39.6% of the girls, while Timbres F and G (representing the low brass) were the least frequently preferred. Timbre D (representing the oboe, English horn, and bassoon) rated high with 24.8% of the girls demonstrating a preference for that timbre. The absence of these instruments in previous studies, however, allows for no comparison regarding the gender association of these instruments. Considered a feminine instrument based on previous research, Timbre B (representing the clarinet) was only the fourth most frequently preferred timbres, ranking below Timbre A, D, and C. Overall, girls demonstrated a strong preference for timbres representing woodwind instruments over timbres representing brass instruments.

With regard to the second research question, a comparison of the percentage of boys and girls who demonstrated a timbre preference for a particular instrument with the percentage of boys and girls who elected to study that instrument revealed a discrepancy between demonstrated timbre preference and instrument choice. In this study, 83% of the boys chose to study instruments that are considered masculine (saxophone, trumpet, trombone), yet only 28% of the boys demonstrated a timbre preference for one of these three instruments. On the other hand, 14.5% of the boys demonstrated a preference for Timbre A (representing the flute), but only 6% of the boys elected to study that instrument. Table 3 reveals that even though boys' timbre

preferences do not conform to typical instrument gender associations, their choices of which instrument they study do.

Table 3 also reveals that girls follow the same pattern of conformity to gender stereotyping when it comes to choosing an instrument to play. Although over 80% of the girls elected to study the flute or clarinet, only 40% of them demonstrated a preference for the timbres that represent those instruments. Conversely, 23.5% of the girls in the study demonstrated a preference for Timbre C (representing the saxophone), yet only 5.2% of the girls elected to play the saxophone. These results support the premise purported by Forney, Boyle and DeCarbo (1993) that regardless of what students say in response to questions about the influence of various factors including the sound of the instrument, males ultimately tend to choose to play instruments that are considered masculine, and females tend to choose to play instruments that are considered feminine. This trend was true even of the 37 students who unknowingly elected to study the instrument for which they demonstrated a timbre preference.

Discussion

Results of this study support the premise that gender stereotyping of instruments is a real phenomenon and indeed influences a student's choice of instrument, potentially nullifying the student's true timbre preference. Students in this study chose instruments according to established gender associations: their timbre preferences did not support their choices.

Instrumental music teachers involved in the instrument selection process must find ways to breakdown gender stereotypes of instruments so that students do not impose limitations on their own musical opportunities. In addition, the high percentage of boys and girls demonstrating a preference for Timbre C (representing the oboe, English horn, and bassoon) should cause music

educators to reconsider their approach to these less familiar instruments. Students are often unfamiliar with these instruments or are often not given the opportunity to play these instruments. Based on the results of this study, instrumental music teachers should provide greater opportunities for students to become familiar with these instruments so that the students can make better-informed decisions regarding instrument choice.

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