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Author(s): Hal Abeles

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Hal Abeles
Teachers College, Columbia University

The researcher sought to examine gender associations across three decades to determine if changes in the sex stereotyping of musical instruments has occurred. First, the study examined the paired comparison gender–instrument rankings of 180 college students. The results confirmed a reduction of instrument gender associations reported in the 1990s. The second index of gender associations employed was the instruments that middle school children played ($N = 2001$). A comparison of the instruments played by boys and girls across three studies conducted in 1978, 1993, and 2007 showed little difference in the sex-by-instrument distribution. Girls played predominately flutes, violins, and clarinets, and most boys played drums, trumpets, and trombones. There was some evidence that in band settings, girls were more likely to play nonconforming gender instruments than were boys. Further studies that focus on parents' influence on children's instrument choices and the effect of ethnicity are recommended.

Keywords: *gender associations; instrumental music*

Research on gender[1] associations with musical instruments has been reported periodically over the past three decades. Although the specific rationales for undertaking these studies have varied, most have generally centered on issues that today might be labeled as social justice concerns. For example, in 1978, Abeles and Porter noted how sex-based stereotyping of instruments can "limit the range of musical experiences available to male and female musicians" (p. 65). Almost two decades later, Green (1997) observed that "both boys and girls tended to restrict themselves or find themselves restricted to certain musical activities for fear of intruding into the other sex's territory" (p. 244). Studies conducted within the past decade (e.g., Conway, 2000; Sinsabaugh, 2005) point to peer pressure related to sex-based stereotyping of instruments as a constraint on students' full participation in music experiences.

Over the past 30 years, as social and political actions have called for equal opportunities for men and women in the workplace, parallel calls for such equity of expectations have been directed at schools. Girls are now by law entitled access to participation in a wide variety of sports programs in publicly funded schools and, in the area of academics, are increasingly encouraged to pursue advanced studies in

Address correspondence to Hal Abeles, Teachers College, Columbia University New York, NY 10027; e-mail: abeles@tc.edu.

math and science in preparation for careers in these historically male-dominated disciplines. In areas such as sports, there is considerable evidence that increased participation in athletics has affected girls' social, psychological, and physical development positively (Coleman, Cox, & Roker, 2008; Colletti, 2007).

If sex-based stereotyping of musical instruments can constrain children's opportunities in music, knowing the current status of this stereotyping should provide information on which to base educational policy decisions and actions. If gender associations with instruments have lessened, then interventions and policies such as those developed in areas such as girls' access to sports may be unnecessary. If, on the other hand, these associations have remained constant or have increased, then more systematic approaches by music educators and others may be required if the stereotyping is to be reduced.

A sociocultural model for gender associations suggests that sex-based stereotypes, such as those for musical instruments, are a consequence of socialization. Based on this model, social movements over the past 40 years, such as the rise of feminism and an increase in the participation of women in the workforce, should have led to a decrease in sex-based stereotyping. Yet, Lueptow, Garovich-Szabo, and Lueptow (2001) reported that social change had not been followed by a change in sex stereotyping. They reviewed 30 studies published between 1974 and 1997, each designed to assess changes in sex-based stereotyping. Some of these trend studies, which sampled the same respondents, took place over a 15-year period (e.g., 1970–1985), whereas other studies, which used different respondents, took place over periods as long as 30 years (e.g., 1962–1992). The studies employed a variety of sex-typing measures including the Bem Sex Role Inventory (Bem, 1974) and Sex Role Stereotype Questionnaire (Petro & Putnam, 1979). From their review, Lueptow et al. (2001) concluded that rather than decreasing, gender associations were stable or intensifying over that period.

This study examined the question, "Have gender associations with musical instruments also remained stable during this period?" Research in the 1990s concerning gender associations and musical instruments (Delzell & Leppla, 1992; Zervoudakes & Tanur, 1994) reported that there appeared to be some change in the musical instrument gender associations of both children and adults when compared to stereotypes reported in the late 1970s and early 1980s (Abeles & Porter, 1978; Griswold & Chroback, 1981). Delzell and Leppla specifically reported that although the order of musical instruments on a masculine–feminine continuum was similar to that found in the Abeles and Porter study, the reduction of the range of normalized scale scores (NSS) along the masculine–feminine continuum indicated "that the degree of gender association is lessening" (p. 96). Delzell and Leppla also reported that there was evidence of a reduction in gender associations when fourth-grade students from six school districts representing urban, suburban, and rural communities were asked to indicate which instruments they would like to play. They found the preferences of the fourth-grade boys to be limited, whereas the girls chose from a wider range of instruments along the masculine–feminine continuum. A majority of the boys indicated that they wanted to play either drums (51.7%) or saxophone (31.5%), and the girls selected flute (30.4%), drums (21.7%), saxophone (21.3%), and clarinet (15.0%).

Zervoudakes and Tanur (1994) specifically sought to examine whether gender associations for musical instruments changed over three decades: the 1960s, 1970s, and 1980s. They explored this by studying 590 concert programs for band and orchestra performances from a national sample of 42 elementary schools, 39 high schools, and 94 colleges during this 30-year period. No more than 6 concert programs from one institution were included in the analysis. They identified the sex of the performers listed in the programs by their first names. The results are reported for orchestra and bands separately, although the analysis of the results in general suggests little difference between the two ensembles. An analysis of the results indicated that the proportion of females playing "female" instruments increased over the three decades "in a statistically significant manner for clarinet, flute, and oboe" (p. 63). Additional analyses indicated that at the elementary level, there was a significant increase in the proportion of girls playing "male" instruments (1960s = .21, 1970s = .29, 1980s = .31) and a reciprocal decrease in the proportion of boys playing those instruments. However, the proportion of high school and college females playing male instruments decreased in the three-decade period. Zervoudakes and Tanur suggested that the data from the elementary school programs may indicate the potential for change if these females do not drop out of instrumental music programs at a rate different from their male counterparts.

Additional studies have explored musical instrument gender associations over the past 30 years. In some cases, their data are used for comparisons with the data generated in this investigation. Abeles and Porter (1978) conducted a four-part study that examined the parameters and possible causes of instrumental sex stereotyping in children and adults. Two phases of their research are closely related to this study. College students from a university in North Carolina were asked to place eight instruments (cello, clarinet, drums, flute, saxophone, trombone, trumpet, and violin) on a masculine–feminine continuum using a paired-comparison ranking strategy. The results then were converted to an instrument gender continuum of NSS. The flute, violin, and clarinet anchored the feminine end of the continuum, whereas the drums, trombone, and trumpet were placed at the masculine end. The cello and saxophone were in the middle of the continuum. In a second study, elementary school children from an urban community in the Northeast and a small Midwestern university town indicated instrumental preferences. Girls selected more feminine instruments but chose a wider range of instruments than their male counterparts, who selected a smaller range of instruments on the masculine end. Gender associations were evident more among fourth-grade through middle school students than among younger students.

In 1981, Griswold and Chroback examined instrument gender associations with a wider variety of instruments than that of Abeles and Porter (1978). In a similar manner to previous studies, college students placed the instruments on a masculine–feminine continuum. The results generally confirmed the findings of Abeles and Porter with the flute, piccolo, glockenspiel, clarinet, piano, French horn, and oboe identified as feminine, whereas the guitar, cymbals, bass drum, trumpet, string bass, and tuba were rated as masculine. The saxophone and cello were classified as feminine and masculine, respectively.

A recent study by Graham (2005) directly relates to this study's focus on college students' gender associations for instruments. Graham asked 235 members of several bands and orchestras at one large Midwestern university, including both males and females and music majors and nonmusic majors, to complete semantic differential scales that measured the gender associations of 16 musical instruments. The results placed the instruments on a feminine to masculine continuum that was similar to that reported in other earlier studies of gender associations. The results indicated that flute was rated as the most feminine instrument and tuba as the most masculine instrument.

In an effort to understand what factors contribute to students' selection of instruments, Fortney, Boyle, and DeCarbo (1993) investigated the instrument choices of 990 sixth-, seventh-, eighth-, and ninth-grade band students from 13 ethnically and socioeconomically diverse middle schools in Dade County, Florida. Participants completed a survey that asked them to report what instrument they played as well as to rate reasons for choosing their instrument and identify the instruments they would most and least like to play. Gender–instrument associations were apparent in the participants' current instrument choice; for example, 90% of the flutists were female and 90% of the trumpet players and percussionists were male. Other results of the study revealed that male participants indicated "feminine" instruments, such as the flute, as being their least preferred instrument. Sound of the instrument was cited as the most important factor in instrument selection by 51% of the respondents, and 31% of the students thought that their music teacher influenced their choice.

This study sought to shed light on several of the issues raised by these previous investigations. Examining some of the same issues reported by Delzell and Leppla (1992), this investigation examined college students' classification of musical instruments along a masculine–feminine continuum. In addition, a national sample of middle school student instrumentalists was used to determine whether students' actual selection of instruments was similar to or different from data collected by other studies in the 1970s and 1990s. This study took place almost 30 years after some of the initial publications in this area and allows comparisons to determine if gender associations for musical instruments reflect the social change that had taken place during this period. Specifically, it attempted to answer two research questions: (1) Have college students' gender associations with musical instruments changed during this period? and (2) Do the music instruments played by boys and girls in middle schools reflect a change in instrument gender associations?

Study 1

During fall 2006, I enlisted colleagues across the country to collect data from groups of 20 college students at nine different colleges and universities. Each group included 10 music majors and 10 nonmusic majors. The nine colleges and universities were located in geographically diverse areas—the northeastern, midwestern, and western parts of the United States—representing urban, suburban, and rural communities. The

sample was a sample of convenience, as the colleges were the home institutions of the nine researchers. The music majors and a majority of the nonmusic majors sampled were members of classes taught by the researchers. At three of the colleges, the nonmusic majors were enrolled in nonmusic major courses, typically Introduction to Music, taught by music faculty colleagues of the researchers. To allow for comparisons with the Abeles and Porter (1978) and Delzell and Leppla (1992) studies, college students completed the same Musical Instruments Paired-Comparison Survey Form (MIPCSF), which consisted of 28 pairs of eight musical instruments often played as part of school music programs: flute, clarinet, saxophone, trumpet, trombone, drums, violin, and cello. As in the previous studies, the college students were asked to circle the instrument in each pair that they considered most masculine.

The paired comparison data generated from the college students were converted to two sets of NSS, one for music majors and one for nonmusic majors, using a procedure described by Edwards (1957). The two resulting rank orders of eight instruments were compared using the Spearman-rank correlation coefficient. This produced a correlation of .962, indicating that musicians and nonmusicians ranked the instruments in almost identical ways. The data from the two groups then were pooled, producing the NSS (labeled "This Study") that appear in Table 1. The NSS from the Abeles and Porter (1978) study as well as the Delzell and Leppla (1992) study also appear in Table 1.

An analysis of the NSS from the three different studies shows that the rank ordering of the instruments on the continuum is almost identical, with the exception that the clarinet and violin shifted positions in the Delzell and Leppla study.

Delzell and Leppla reported a reduction of the total range of NSS from the Abeles and Porter study. The range of this study's NSS reflects the same reduction of range and the range is virtually identical ($t = 0.0393$, $p = 0.97$) to the one reported by Delzell and Leppla in 1992 (1978 range = 4.195, $M = 2.611$, $SD = 1.417$; 1992 range = 2.969, $M = 1.649$, $SD = 1.073$; current study range = 2.962, $M = 1.645$, $SD = 1.013$).

Table 1
Normalized Scale Scores for College Students

	Abeles & Porter (1978) $n = 58$	Delzell & Leppla (1992) $n = 222$	This Study $N = 180$
Flute	0.000	0.000	0.000
Violin	1.518	0.824	0.843
Clarinet	1.949	0.775	0.910
Cello	2.643	1.276	1.458
Saxophone	3.182	2.260	2.089
Trumpet	3.261	2.408	2.329
Trombone	4.143	2.679	2.568
Drum	4.195	2.969	2.962

Study 2

For the second part of the project, we gathered information about instrumental musicians in nine middle school (sixth through eighth grades) bands and orchestras from the same communities in the northeastern, midwestern, and western parts of the United States used in Study 1. The one middle school selected from each college or university community was either the only middle school in the community or was located close to the college or university. The schools represented the urban, suburban, and rural communities in which the colleges or universities were located. To be included in the study, each middle school selected had to have both a string and wind instrumental program. Total enrollments of the middle schools ranged from 332 students, in a small upstate New York community, to 835, in a large suburban Los Angeles school district. The specific information sought was the distribution by sex of student performers on the eight instruments found on the MIPCSF. These data were collected through reports of the instrumental music teachers at each school. Data were collected for a total of 2,001 middle school instrumentalists.

The results for the 2,001 middle school students appear in Table 2. An examination of Table 2 shows that musical instrument selections reflect sex differences similar to those reported in previous studies. A majority (85.3%) of the girls were playing flutes, violins, clarinets, and cellos. A majority (72.7%) of the boys were playing saxophones, trombones, trumpets, and drums. More than one in four boys played trumpet. In contrast to the findings of previous studies, boys were slightly more likely to play a stereotypical female instrument (a little more than 20% played flute, violin, or clarinet) than girls were to play a stereotypical male instrument (about 10% of the girls played trombone, trumpet, or drums). There do not appear to be trends in instrument choices over the three grades. Of the 2,001 students participating in instrumental musical in these nine middle schools, 1,148 (57.3%) were girls.

The data in Table 2 were converted to NSS using both the Abeles and Porter NSS (to allow for comparison between this study's results and the results reported by Abeles and Porter) and the NSS generated in this study. The results are presented in Table 3. A comparison of the converted 1978 data and this study's data (converted with the 1978 NSS) revealed that the scores are "very similar" (a statistical test is not possible because complete data are not available from the 1978 study).

To compare this study's data with another previous indicator of gender associations, results from the Fortney et al. (1993) investigation of instrument choices of 990 sixth-, seventh-, eighth-, and ninth-grade band students were used. To make the data more comparable, data from both studies were reduced to six instruments common to both studies (see Table 4). It should be noted that the Fortney et al. study included 145 ninth graders, whereas this study included only sixth, seventh, and eighth graders.

The results indicate that when limited to these six instruments, in both the Fortney et al. study and this study, middle school students' instrument selections appear to be related to instrument gender associations. Table 4 reveals that the instrument selection

Table 2
Middle School Students' Instrument Selections

	Sixth Grade				Seventh Grade				Eighth Grade				Total	
Instrument	Girls		Boys		Girls		Boys		Girls		Boys		Girls	Boys
Flute	20.4%	93	1.4%	5	27.8%	98	1.4%	4	23.0%	78	2.7%	6	23.4%	1.8%
Violin	26.1%	119	13.0%	45	32.0%	113	8.7%	25	35.1%	119	8.6%	19	30.6%	10.4%
Clarinet	26.1%	119	7.8%	27	17.6%	62	7.0%	20	17.4%	59	9.1%	20	20.9%	7.9%
Cello	10.3%	47	8.1%	28	8.5%	30	9.4%	27	11.2%	38	3.2%	7	10.0%	7.3%
Saxophone	5.7%	26	12.4%	43	3.4%	12	15.7%	45	5.3%	18	14.1%	31	4.9%	14.0%
Trombone	3.5%	16	17.9%	62	2.3%	8	16.1%	46	1.2%	4	15.5%	34	2.4%	16.6%
Trumpet	5.9%	27	28.0%	97	5.9%	21	28.0%	80	3.8%	13	28.6%	63	5.3%	28.1%
Drums	2.0%	9	11.5%	40	2.5%	9	13.6%	39	2.9%	10	18.2%	40	2.4%	14.0%
	100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%	100.0%
Number		456		347		353		286		339		220	1148	853

Table 3
Comparison of Normalized Scale Score Means for Students' Instrument Selections: Abeles and Porter (1978) and This Study

	Sixth Grade		Seventh Grade		Eighth Grade	
Study	Girls	Boys	Girls	Boys	Girls	Boys
Abeles & Porter (1978)	1.61[a]	2.99	1.62	3.34	1.69	3.29
This study[b]	1.80	3.17	1.59	3.26	1.65	3.29
This study[c]	1.02	2.03	0.91	2.10	0.94	2.13

a. Higher score indicates more masculine.
b. Converted with 1978's instrument normalized scale scores (NSS).
c. Converted with this study's instrument NSS.

Table 4
Comparison of Middle School Students' Instrument Selections: Fortney, Boyle, and DeCarbo (1993) and This Study

	Fortney et al. (1993)				This Study			
Instrument	Girls		Boys		Girls		Boys	
Flute	126	33.1%	12	2.5%	269	39.4%	15	2.1%
Clarinet	164	43.0%	50	10.3%	240	35.2%	67	9.5%
Saxophone	41	10.8%	105	21.7%	56	8.2%	119	17.0%
Trombone	7	1.8%	61	12.6%	28	4.1%	142	20.2%
Trumpet	21	5.5%	154	31.8%	61	8.9%	240	34.2%
Drums	22	5.8%	102	21.1%	28	4.1%	119	17.0%
		100.0%		100.0%		100.0%		100.0%
Number	381		484		682		702	

pattern by sex is very similar in both sets of data. In the 1993 study, 76.1% of the girls played either flute or clarinet, whereas in this study, 74.6% played those two instruments. In 1993, 65.5% of the boys played trombone, trumpet, or drums, whereas in this study, the percentage who played those instruments was 71.4%. Results of a test of statistical significance indicated that these sex groupings did not differ significantly across the two studies ($\chi^2 = 1.02$, $df = 1$, $p = ns$). In 1993, 13.1% of the girls "crossed over" and played an instrument generally associated with males (drums, trumpet, and trombone), whereas in this study, 17.1% of the girls crossed over. In 1993, 12.8% of the boys played flute or clarinet. The percentage of boys who played these two instruments was 11.6% in this study. Further analysis of the crossover data indicated that the change noted in the girls' increased selection of crossover instruments in this study was a statistically significant change ($\chi^2 = 5.77$, $df = 1$, $p = .016$).

Discussion and Conclusion

One index of change in gender associations with musical instruments used in this study was how college students ranked musical instruments on a gender continuum. To examine this question, three sets of data generated in three different decades were examined (Table 1). Based on the reports of all three studies (Abeles & Porter, 1978; Delzell & Leppla, 1992; this study), we concluded that music major college students and nonmusic majors ranked musical instruments on a gender continuum in similar ways. These results are similar to those reported by Graham (2005).

In 1992, Delzell and Leppla reported a reduction of range in the normalized instrument gender scale scores from the 1978 Abeles and Porter study. Delzell and Leppla (1992) stated that this result may have indicated a change in the strength of gender associations with musical instruments. The results of this investigation, which produced NSS that were virtually identical to those found by Delzell and Leppla, verify that reduction but show no additional lessening of instrument gender associations over the approximately 15 years between the Delzell and Leppla study and this one.

For this study, we considered data concerning the instruments that middle school students played as an index of possible change in musical instrument gender associations. Once again, the data from previous studies provided for comparisons across three decades: the 1970s, 1990s, and 2000s. The results suggest that there has been little change. A comparison of the average normalized instrument gender scale scores for middle school instrumentalists reported by Abeles and Porter in 1978 and this investigation (Table 3) shows little difference. An additional analysis was conducted comparing the Fortney et al. (1993) results with those of this study. This comparison also revealed a similar pattern of sex-based instrument choices across the two decades.

These results, that boys and girls are still mostly choosing to play the same kinds of instruments that children did in the 1970s and 1990s, do not confirm the trends noted in earlier studies (Delzell & Leppla, 1992; Zervoudakes & Tanur, 1994), which seemed to suggest that young girls in particular were interested in playing instruments that represent wider gender stereotypes. A logical consequence of girls' interest in playing a more diverse set of instruments would be that the distribution of instrumentalists would be less predictable by sex of the students.

Yet, a closer analysis of this study's data presents somewhat conflicting perspectives with regard to students' playing of instruments that do not conform to the instruments' gender stereotypes. Based on the list of eight musical instruments (Abeles & Porter, 1978), about 20% of the boys were playing instruments that did not conform to gender stereotypes (flute, violin, and clarinet), whereas only 10% of the girls were playing nonconforming instruments (drums, trumpet, and trombone). However, of the 172 boys who were playing nonconforming instruments, more than half (89) were playing the violin. When limiting the list to just band (wind and percussion) instruments, only about 12% of the boys were playing traditionally feminine instruments (flute and clarinet), whereas 17% of the girls were playing traditionally masculine instruments (trombone,

trumpet, and drums). Although the fact that 17% of the girls played nonconforming instruments represents a statistically significant increase over the 13% reported in 1993, the question remains, "Is this a meaningful increase?" The data indicate that at the time of this study, more girls were playing trumpet and trombone than in 1993, although slightly fewer girls were playing drums.

What happens between the time when a student provides an indication of preference for or interest in a particular instrument (during the fourth grade in Delzell and Leppla's study) and his or her actual selection of an instrument? How is it that the second most popular instrument preferred by fourth-grade girls is drums (Delzell & Leppla, 1992), yet in both the Fortney et al. study and this study, only about one in five drummers is a girl?

Possible alternative explanations for the results observed may be found in the factors other than gender that influence the actual choice of instrument. Graham (2005) examined college instrumentalists' reasons for selecting a band or orchestra instrument. Her results produced eight factors including physical properties of the instrument and influences of father, mother, and male or female relatives as well as influence of the teachers. Sinsabaugh (2005) continued with this line of investigation by studying middle and high school students who crossed over gender stereotypes in their instrument choices. She explored family, peers, personality, and school environment as factors in these nontraditional choices. Through interviews with students, parents, and teachers, and in-school observations of the students, the researcher confirmed that a variety of factors—including instruments' sounds; students' body sizes; and family, peer, and teacher opinions—influenced students' decisions to play a particular instrument.

Other researchers (Bayley, 2000; Brophy, 1985; Fortney et al., 1993) have suggested that teachers may influence student instrument selection. In 2004, Johnson and Stewart focused their investigation on how gender associations might influence instrumental music teachers' counseling students in the instrument selection process. They concluded that "simply knowing the sex of the student did not have a significant impact on what instrument band directors recommended the students play" (p. 139). That result may indicate that music teachers have become sensitive to the instrument gender associations and are likely to avoid them when helping students choose instruments. These results were confirmed in a second study (Johnson & Stewart, 2005), which indicated that both sex and racial identification were not significant factors in instrument assignment by teachers.

In several studies, students reported that the timbre of instruments played a role in their instrument selection (e.g., Fortney et al., 1993; Graham, 2005). The Gordon Instrument Timbre Preference Test (ITPT) was designed to facilitate music educators' use of students' timbre preferences to help them in instrument selection (Gordon, 1986). However, research on the ITPT (e.g., Rideout, 1988; Schmidt & Lewis, 1988) is ambiguous with regard to the effectiveness of this approach.

Student participants in some studies have reported that parents influenced their instrument choices (Conway, 2000; Fortney et al., 1993; Sinsabaugh, 2005). Yet, we

do not know very much about parents' musical instrument gender associations. It appears that the only study to look systematically at parents' musical instrument gender associations is the 30-year-old Abeles and Porter study, which reported that parents were influenced by the sex-based stereotypes of instruments when selecting instruments for their children. Confirmatory studies of this issue seem warranted.

Another factor described by Sinsabaugh (2005) that may influence musical instrument selection is ethnicity. Sinsabaugh reported that music instrument gender associations may differ across cultures. Specifically, she reported that in Asian cultures, boys are encouraged to play violin and flute. Further research into possible culture–gender interactions seems necessary to understand musical instrument selection more completely.

There are two research design issues that may affect the confidence that can be placed in the results of trend studies like this one: (a) the differences in the characteristics of the samples used in the comparison studies and (b) the differences in the assessment procedures used in the comparison studies. The samples used for comparisons in this trend study differed in several ways. The college students sampled by Abeles and Porter (1978) came from one midsized university in the South, whereas Delzell and Leppla (1992) sampled students from a large Midwestern university. This study used a more geographically diverse sample of college students from nine colleges and universities that differed both in size and type (i.e., small liberal arts college vs. large research university). In addition, the middle school students whose instrument choices were sampled were also from different areas of the country. The middle school students participating in the 1978 Abeles and Porter study came from one Midwestern university town, the students participating in the 1993 Fortney et al. study came from 13 diverse schools in Dade County, Florida, and the students responding in this study represented a national geographically diverse sample of middle schools, many of which were located in university communities. It also should be noted that the Fortney et al. study included ninth graders, whereas the other two comparison studies included only sixth, seventh, and eighth graders. As is typical in trend studies, which do not use the same sample, differences among the samples used present alternative explanations for the results. On the other hand, data collection tools used for the comparison were virtually identical. In all three studies of college students' gender associations, the MIPCSF scale was used to collect data. For the three studies that compared the instruments that middle school students played, data collection simply involved reports from teachers of the number of students of each instrument categorized by the sex of the students. Because the assessment procedures were the same for the different comparison groups, it is less likely that they differentially affected the outcomes observed. The similarities and differences of the samples and assessment procedures should be considered when interpreting the results presented in this article.

The results of this study suggest that more systematic interventions by music educators may be necessary if gender associations with instruments are to be reduced. As reported earlier, these associations appear to restrict participation in some music education experiences. The consequences of these limitations have implications beyond the

music classroom. At a 1999 College Band Directors National Association conference, a panelist posed the question, "Does the choice of instrument affect the likelihood of becoming a band director?," suggesting that most college band directors were brass players (Grant, 2000). A study by Kopetz (1980) examined this question by focusing on how the gender of, and the instruments played by, candidates for instrumental music positions affected the likelihood of being hired by school principals. The results indicated that the instrument played by the candidate was an important predictor of being hired for an instrumental music position.[2] In another, more recent study, Cramer, Million, and Perreault (2002) surveyed college students to examine how gender associations with musical instruments affected their perceptions of musicians. They found that the perceptions of male and female musicians depended on the instrument on which the performers played. For example, "males who played feminine instruments were perceived as less dominant and active and had less leadership skills than females playing the identical instruments" (p. 171). The results of these studies suggest that gender associations with musical instruments have far-reaching consequences beyond the music classroom and may restrict the vocational aspirations of both female and male musicians.

Notes

1. As recommended by Glasser and Smith (2008), *gender* is used in this article to refer to the social or cultural construct of being male or female, whereas *sex* is used as a binary biological category.

2. Kopetz (1980) reported that "instrument played" accounted for 10% of the total variance in predicting who would be hired and that trumpet applicants were perceived as the most desirable instrumentalists. Zdzinski (2005), commenting on these findings, stated, "If one examines the instruments commonly played by female instrumentalists, the research by Kopetz may suggest that gender discrimination in band hiring may in fact be exaggerated by playing the 'wrong' instrument" (p. 197).

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Hal Abeles is professor of music and music education at Teachers College, Columbia University. His research interests include assessment in the arts, musical instrument gender associations, and instrumental music pedagogy.

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