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# High School Music Ensemble Students in the United States: A Demographic Profile

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## Kenneth Elpus<sup>1</sup> and Carlos R. Abril<sup>1</sup>

#### Abstract

The purpose of this study is to construct a national demographic profile of high school band, choir, and orchestra students in the United States using evidence from the 2004 follow-up wave of the Education Longitudinal Study of 2002. Results indicate that 21% of seniors in the United States' class of 2004 participated in school music ensembles. Significant associations were found between music ensemble participation and variables including gender, race/ethnicity, socioeconomic status (SES), native language, parents' education, standardized test scores, and GPA. Certain groups of students, including those who are male, English language learners, Hispanic, children of parents holding a high school diploma or less, and in the lowest SES quartile, were significantly underrepresented in music programs across the United States. In contrast, white students were significantly overrepresented among music students, as were students from higher SES backgrounds, native English speakers, students in the highest standardized test score quartiles, children of parents holding advanced postsecondary degrees, and students with GPAs ranging from 3.01 to 4.0. Findings indicate that music students.

#### Keywords

music participation, socioeconomic status, race and ethnicity, large ensembles, demographics

Advocates for music education have purported that the study of music can provide tremendous benefits, ranging from making children smarter (Schellenberg, 2004) to

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**Corresponding Author:** Kenneth Elpus, Northwestern University, Henry and Leigh Bienen School of Music, 711 Elgin Road, Evanston, IL 60208 Email: elpus@u.northwestern.edu giving children a higher lifetime earning potential (MENC–The National Association for Music Education, 2007). The bulk of these claims often fail to take into account significant factors such as socioeconomic status (SES), race, ethnicity, and native language, which have been found to be predictors of students' future educational and economic attainment (Ballantine & Hammack, 2009; Freeman & Freeman, 2001; MacLeod, 2008) and which also may be associated with school music participation. Advocacy claims grounded in specific findings from research often obfuscate the influence of these important variables. An in-depth examination of students who participate in school music programs can provide an understanding of this subgroup of the school population and reveal how it compares to non-music peers. This understanding also might help researchers sort out what effects school music participation has on broad educational outcomes independent of background characteristics such as SES, ethnicity, and native language.

Sociologists of education "recognize that schooling is a valued commodity and it is distributed unevenly. . . . The extent of [educational] inequality (access, outcomes, nature of experiences) primarily, in the United States at least, [is] linked to social class [and] race" (Weis et al., 2008, p. 1). As such, the predictive value of SES in a student's access to and continued election of music study, particularly in instrumental music study, has a strong basis in the research literature both within and outside of music education. Klinedinst (1991) found that student SES was the strongest of several predictors of student retention in middle school instrumental music. Schools with low average SES, regardless of urbanicity, were the least likely to offer string programs (Smith, 1997). U.S. secondary schools with a higher average SES offered a wider array of music course offerings than their lower SES counterparts (Abril & Gault, 2008). Corenblum and Marshall (1998) found that SES was a strong predictor of students' perceptions of the attitudes of "significant others" (such as parents and teachers) toward their continued music study, "which, in turn, predicted intentions" (p. 136) to continue elective music participation. Although he folded school music participation into the general categorization of "fine arts" extracurricular activities, McNeal (1998) found that "higher SES students are significantly more likely to participate in each category of extracurricular activity except vocational activities" (p. 188). Using data from the National Longitudinal Study of Adolescent Health, researchers found that adolescents from lower socioeconomic statuses participated in extracurricular activities, including music, at lower rates than their higher SES peers (Feldman & Matjasko, 2007).

Other background characteristics such as family composition, parental education, academic achievement, native language, and race/ethnicity—what sociologists of education might refer to as "determinants of inequality" (Lauen & Tyson, 2009, p. 72)— also have been found to be associated with music participation and course-taking patterns in general. Kinney (2010) found family composition and academic achievement to be significant predictors of band enrollment in an urban school district. He found that students from two-parent/guardian homes and those with higher academic

achievement were more likely to enroll in band than were their peers from singleparent/guardian homes and with lower academic achievement, respectively. Parental level of education also has been shown to influence arts engagement in the United States. In the most recent Survey of Public Participation in the Arts, the National Endowment for the Arts (2009) reported that level of arts activity was significantly and positively associated with educational attainment and income.

English language learners (ELLs)—students who speak a native language other than English—also are likely to face barriers to participating in school music (Bradley, 2007). Callahan, Wilkinson, and Muller (2010) reported that certain language minority high school students were retained in ELL courses beyond the time needed to acquire sufficient English language skills, and this extended ELL retention resulted in reduced access to elective and advanced courses. Few researchers in music education have directly confronted issues of race/ethnicity and music course-taking patterns. One such scholar exploring racial issues reported that in one Midwestern school district, the secondary music courses comprised predominantly white students, in a proportion far out of balance with the overall racial diversity of that district (Bradley, 2007).

A body of research in music education has sought to examine potential associations between music study and academic achievement and school engagement. As the literature has grown, two distinct branches of research have emerged. In the first branch, researchers have demonstrated that music students are statistically similar to their nonmusic peers on standardized tests (Kvet, 1985; Wallick, 1998). While these studies found no "value added" in the study of music, they demonstrated that students who studied music during the school day were not at an academic disadvantage to their non-music peers, even if their non-music peers received more instructional time in the academic subjects. In the second branch, researchers have sought to determine if a cognitive advantage is gained through the study of music. The results in this branch are decidedly mixed: Most authors have found small, if any, effect sizes when SES is ignored or inadequately controlled (e.g., Cheek & Smith, 1999; Helmrich, 2010), and those that considered SES as a variable have found music study to only slightly moderate the effects of SES, if at all (Fitzpatrick, 2006; Kinney, 2008; Miksza, 2007, 2010 Southgate & Roscigno, 2009). Research in adolescent development has suggested, however, that music students are more engaged in school and more likely to participate in prosocial activities that lead to positive developmental and educational outcomes (Eccles & Barber, 1999; Feldman & Matjasko, 2007).

Music education research has used nationally representative data sets from the U.S. Department of Education to examine the academic achievement of music students (e.g., Miksza, 2007, 2010), but only Stewart (1991) has used one of these data sources to generate a national estimate of the demographic profile of music students (for the senior class of 1982). Using data from the National Center for Education Statistics (NCES) High School and Beyond (HS&B) study, Stewart sought to determine the school factors that led to offering elective music and the social characteristics of students who elected to study music. Results indicated that 30.9% of high school seniors

in the United States were enrolled in music performance classes but "enrollment in certain music classes [was] lower for . . . those students from lower-class backgrounds" (p. 188). Additionally, Stewart found that "high school music students on average—particularly performance students—have a tendency to come from more advantaged backgrounds" (p. 185). She also found disparity in music enrollment by gender (61.4% female, 38.6% male). Stewart also is one of few researchers in music education to examine directly the association between race/ethnicity and music enrollment; she found that non-white students tended to take fewer music courses in high school than did white students.

Stewart's data from the HS&B study examined the cohort of students who graduated from high schools in 1982. Since that time, there have been major shifts in the educational policy environment, including the publication of A Nation at Risk in 1983, the Goals 2000: Educate America Act in 1994 granting the arts "core" status and leading to the drafting of the National Standards for Arts Education and the passage of the No Child Left Behind Act (NCLB) in 2001. In addition, the popular press (e.g., Dillon, 2006) and think tank reports (e.g., McMurrer, 2007) have led to the widespread belief that music education in America is in a state of policy-driven decline since the enactment of No Child Left Behind provisions in 2001-2002 (Abril, 2009b). Descriptive research is needed to update Stewart's (1991) work with more recent nationally representative data and to document what background characteristics are associated with high school music participation. There also is a need to see if associations with music participation and demographic characteristics demonstrated in more limited locations in prior research (Bradley, 2007; Corenblum & Marshall, 1998; Fitzpatrick, 2006; Kinney, 2008, 2010; Klinedinst, 1991; Wallick, 1998) scale up to the national level. Given that music ensembles are primarily offered as electives in U.S. high schools, this study also can serve to inform practitioners as they develop, implement, and evaluate recruitment and retention efforts in their programs.

#### Purpose of the Study and Research Questions

The purpose of this study was to build a profile of U.S. high school students who participated in school music ensemble programs. Specific research questions included the following: (1) What proportion of high school seniors participate in music ensemble programs (i.e., band, choir, and/or orchestra), both nationwide and by region of the country? (2) What are the demographic characteristics of these high school seniors? (3) Is there a relationship between the various demographic variables and music participation? and (4) Are music students a representative subset of the senior high school population, and if not, on what dimensions do they differ? To answer these questions, we analyzed data from the Education Longitudinal Study of 2002 (ELS), a nationally representative multiple-wave longitudinal study conducted by the U.S. Department of Education's NCES.

#### Method

#### Data Source

**Overview.** In 2002, NCES began a "major longitudinal effort designed to provide trend data about critical transitions experienced by students as they proceed through high school and into postsecondary education or their careers" (Ingels et al., 2007, p. 7). That study, ELS,<sup>1</sup> follows a nationally representative sample of  $16,400^{\dagger}$  American high school students who were enrolled in public and private high schools as sophomores in the spring of 2002. Thus far, data have been collected in 2002 (referred to as the *base year*) when the cohort was in 10th grade, 2004 (the *first follow-up*) when most of the cohort was in 12th grade, and 2006 (the *second follow-up*) when most of the cohort was 2 years past high school graduation. A third follow-up round of data collection, scheduled for 2012, is pending congressional appropriation. At the first follow-up point, complete high school transcripts were collected for approximately 14,900<sup>†</sup> of the students in the sample.

Unit of analysis. Although the primary unit of analysis for ELS is at the student level, data also were collected from students' parents, school building administrators, math and English teachers, and school librarians. The database is structured with links so that data may be analyzed at any of the levels of collection or at multiple levels simultaneously; that is, any one student can be linked to the data from his or her school. The current study analyzed data at the student level, although information on school urbanicity and region of the country was linked from the school-level data.

Sampling and weighting. ELS uses a complex cluster sampling design.<sup>2</sup> For the base year, schools, the primary sampling unit, were randomly sampled from the population of American public and private schools that had a 10th grade class in 2002. Of 1,200 schools contacted to participate,  $750^{\dagger}$  agreed. In each participating school, approximately 25 students were selected from the 2002 10th grade rosters using a non-random, probabilistic sampling procedure. To ensure their adequate representation in the study, Hispanic and Asian students were deliberately oversampled. NCES attempted to recruit  $17,590^{\dagger}$  students for the sample. Of those contacted,  $15,630^{\dagger}$  participated, yielding a response rate of 87.3%. Sample weights were derived by NCES from their own data as well as U.S. Census data to account for the oversampling of Hispanic and Asian students and to ensure that the  $15,630^{\dagger}$  base-year participants in the study, when weighted, yield data that are as close an estimate to the target population as is technically possible. Due to the use of sample weighting to ensure accurate representation of the target population, results reported in this study must be considered estimates.

In the 2004 follow-up, approximately 8% of the initial cohort had moved to a new school, and others had dropped out of school or had become homeschooled. In nearly all cases, these students were located and remained a part of the study. When sample weights are applied, the first follow-up sample ( $N = 14,930^{\dagger}$ , response rate of 92.18%) is representative of approximately 3.5 million high school seniors, dropouts, homeschoolers, and early graduates. Additional students who had not been surveyed in

2002 were added to the sample to ensure that the subset of respondents who participated as seniors in 2004 ( $n = 13,420^{\dagger}$ ) was representative of the approximately 3 million 12th graders in U.S. high schools in the spring of 2004.

#### The Present Study's Use of ELS Data

For the purposes of the present study, we examined the demographic profile of the then-currently enrolled senior class of 2004 as surveyed in the first follow-up using a cross-sectional analysis. To permit direct comparisons with Stewart's (1991) analysis of HS&B data, and following her methodology, our sample ( $n = 13,240^{\dagger}$ ) excludes  $210^{\dagger}$  ELS sample members who were dropouts, early graduates, or homeschooled as of the spring of 2004. For this study, all cases were weighted in analyses according to the first follow-up "expanded sample weight" to ensure that our estimates generalize to the entire population of students enrolled in U.S. public and private schools as seniors in the spring of 2004. Sample sizes reported in the Results section reflect the application of this weight.

Cluster sampling of students within schools fundamentally differs from simple random sampling in that students from any one sampled school tend to be more like each other than they tend to be like students from other schools in the sample. Given this violation of the assumption of independent observations inherent in the survey design, all data were analyzed here using the "Complex Samples" module of IBM SPSS Statistics 18.0, which, for each analysis, estimates the design effects introduced by cluster sampling and adjusts the statistical procedures and significance tests accordingly.

#### Variables Examined

We carefully selected only a small subset of the variables available in ELS based on the following criteria: (1) theoretical relevance to this study; (2) significance of the variable or the construct represented by the variable as a correlate of music study in prior research; and (3) usefulness in accurately describing the subset of U.S. high school students who opted to participate in a school music ensemble. The variables examined present a cross-sectional snapshot of the sample's gender, SES,<sup>3</sup> racial/ ethnic makeup, and academic achievement.

In the first follow-up survey instrument, sample members were asked if they had participated in school-sponsored "band, orchestra, chorus, [or] choir" during their senior year. The question appears in both the full-length and abbreviated versions of the survey instrument and also appears on the altered version of the instrument given to sample members who had transferred to a new school between 2002 and 2004. We used the self-reported response to this question as our grouping variable to determine music participation status. Cases with missing data for any particular variable were eliminated listwise from the analyses.

#### Results

We sought to determine the proportion of U.S. high school students who participated in music and to establish their demographic profile. Results indicate that 21% of American high school seniors participated in band, choir, and/or orchestra in 2004. Herein, we will refer to these students as music students (n = 621,895); all other students will be referred to as non-music students (n = 2,337,850). The proportion of music to non-music students stratified by region of the United States was as follows: Northeast (music = 20.5%, non-music = 79.5%); South (music = 20.1%, non-music = 79.9%); Midwest (music = 25.7%, non-music = 74.3%); and West (music = 17.7%; nonmusic = 82.3%). When examining music students alone, they are represented as follows according to U.S. region: South (32.3%, n = 201,030); Midwest (30.2%, n =187,842); West (19.2%, n = 119,671); and Northeast (18.2%, n = 113,352). The majority of music students in the United States attended suburban schools (51.2%), followed by urban (27.6%) and rural schools (21.3%). The music student percentages were similar to national figures for all students: suburban schools (50%), urban schools (30%), and rural schools (20%).

Sixty-one percent of the students were female. Race/ethnicity of music students was as follows: White (65.7%), Black (15.2%), Hispanic (10.2%), Multiracial (4.3%), Asian (3.8%), American Indian/Alaska Native (0.7%), and Native Hawaiian/Pacific Islander (0.2%). English was the primary native language of music students (90.4%) followed by Spanish (4.4%) and Pacific and Southeast Asian languages (2%). The remaining 3.2% of music students accounted for all other native languages. The socio-economic statuses of music students were as follows: highest quartile (32.2%), third quartile (27.8%), second quartile (23%), and lowest SES quartile (17%). Most music students lived in a single-parent/guardian home. Students who participated in music ensembles had an average of 3.95 Carnegie units<sup>4</sup> of visual and performing arts coursework on their transcripts by the time they graduated from high school.

Because all data under consideration were categorical and the nature of this investigation was descriptive, nonparametric tests of independence were used to determine whether music students were representative of the total population. Specifically, we used the second-order Rao-Scott adjusted  $\chi^2$  statistic (Rao & Scott, 1984) to examine which demographic variables were associated with school music ensemble participation for the spring 2004 senior cohort. This statistic, reported as an *F* ratio, is the Pearson  $\chi^2$  test of independence adjusted for the effects of cluster sampling in the ELS design. Due to the large sample size and number of planned analyses, we set our  $\alpha$  level for significance to .005. To further describe the nature of the associations found between demographics and music ensemble participation, adjusted standardized residuals for each category of the demographic variables were computed as a post hoc to the Rao-Scott adjusted chi-square results. We used the adjusted standardized residuals to determine which categories were either overrepresented or underrepresented in the school music ensemble student population. Adjusted standardized residuals are interpretable as *z*-scores; those cells with adjusted standardized residuals outside the range of  $\pm 2.807$  are considered to have significantly affected the overall Rao-Scott adjusted  $\chi^2$  test statistic at p < .005 (two-tailed).

Table 1 displays the results of the Rao-Scott adjusted  $\chi^2$  tests of independence used to examine the associations between demographic variables and music participation. There were significant associations between music participation and every demographic variable examined except for school urbanicity and family composition. Results point to a gender imbalance among music students. While the total population of the senior cohort of 2004 was 50% male and 50% female, 61.1% of music students were female. The association between gender and music participation is significant,  $F(1, 390^{\dagger}) = 112.38, p < .001$ .

We also found a significant association between race/ethnicity and ensemble participation,  $F(5, 2030^{\dagger}) = 9.024$ , p < .001. Some groups were overrepresented: White students made up 62.3% of the population, but 65.7% of music students were white. Adjusted standardized residuals showed that the overrepresentation of white students among music students significantly contributed to the overall association between race/ethnicity and music ensemble participation. Hispanic students were significantly underrepresented among music students, with an adjusted standardized residual of -7.174, which is significant at p < .0001. Hispanic students made up 15.1% of the population, but only 10.2% of music students were Hispanic. When considered as a percentage of the total population, only 2.1% of students in the class of 2004 were Hispanic music students. The odds ratio indicates that music students were 1.7 times more likely to be white than to be Hispanic. Black music students (15.2%) appear overrepresented given that black students make up only 13.2% of the overall student population. However, this result was not statistically significant at our  $\alpha$  level.

Socioeconomic status and its correlates also were significantly associated with participation in music ensembles. Students in the lowest quartile were significantly underrepresented in the music student population, while those in the highest socioeconomic quartile were significantly overrepresented among music students. The odds ratio indicated that music students were 1.71 times more likely to be in the highest SES quartile than they were to be in the lowest SES quartile. Native English speakers were significantly overrepresented in the music student population, while native Spanish speakers were significantly underrepresented. According to the odds ratio, music students were 2.03 times more likely to be native English speakers than they were to speak Spanish, the next most frequently reported native language. We found no significant association between family composition and music participation. However, we found an association between parental educational attainment and student music participation. The highest-achieving parent's level of education was significantly associated with music ensemble participation,  $F(3, 1160^{\dagger}) = 16.78$ , p < .001; children of parents who had earned a high school diploma or less were significantly underrepresented among music students, while children of parents who had earned a master's degree, JD, MD, PhD,

| Variable                                      | df                        | Rao-Scott adjusted $\chi^2$ | Adjusted standardized residuals <sup>a</sup> |
|-----------------------------------------------|---------------------------|-----------------------------|----------------------------------------------|
| Gender                                        | (1, 390 <sup>†</sup> )    | 112.38*                     |                                              |
| Female                                        |                           |                             | 10.82*                                       |
| Male                                          |                           |                             | -10.82*                                      |
| Race/ethnicity                                | (6, 2040 <sup>†</sup> )   | 9.02*                       |                                              |
| American Indian/Alaska Native                 | . ,                       |                             | -0.93                                        |
| Asian                                         |                           |                             | -1.37                                        |
| Black or African American                     |                           |                             | 2.38                                         |
| Hispanic                                      |                           |                             | -7.17*                                       |
| Multiracial                                   |                           |                             | 0.94                                         |
| Native Hawaiian, Pacific Islander             |                           |                             | -1.78                                        |
| White                                         |                           |                             | 3.16*                                        |
| Socioeconomic status by quartile              | (3, I I 40 <sup>†</sup> ) | 16.78*                      |                                              |
| Lowest quartile                               | · · · ·                   |                             | -6.43*                                       |
| Second quartile                               |                           |                             | -1.51                                        |
| Third quartile                                |                           |                             | 1.76                                         |
| Highest quartile                              |                           |                             | 5.18*                                        |
| Family composition                            | (1,390 <sup>†</sup> )     | 4.44                        |                                              |
| Dual parent/guardian family                   | ( , ,                     |                             | _                                            |
| Single parent/guardian family                 |                           |                             | _                                            |
| Student's native language                     | (5, I7I0 <sup>†</sup> )   | 7.34*                       |                                              |
| English                                       |                           |                             | 5.69*                                        |
| Spanish                                       |                           |                             | -7.78*                                       |
| Other European languages                      |                           |                             | -0.40                                        |
| West/South Asian languages                    |                           |                             | -1.06                                        |
| Pacific Asian/Southeast Asian languages       |                           |                             | -0.65                                        |
| All other languages                           |                           |                             | -0.10                                        |
| Urbanicity of school attended                 | (2, 770 <sup>†</sup> )    | 0.83                        |                                              |
| Urban                                         |                           |                             | _                                            |
| Suburban                                      |                           |                             | _                                            |
| Rural                                         |                           |                             | _                                            |
| Highest-achieving parent's level of education | (3, 1160 <sup>†</sup> )   | 16.78*                      |                                              |
| High school diploma or less                   |                           |                             | -6.98*                                       |
| Some post-secondary school                    |                           |                             | 0.33                                         |
| 4-year post-secondary degree                  |                           |                             | 2.76                                         |
| Master's, doctorate, or other advanced degree |                           |                             | 3.95*                                        |

Table 1. Rao-Scott Adjusted  $\chi^2$  Tests of Independence for Demographic Variables and Music Participation

(continued)

#### Table I. (continued)

| Variable                                        | df                        | Rao-Scott adjusted $\chi^2$ | Adjusted standardized residuals <sup>a</sup> |
|-------------------------------------------------|---------------------------|-----------------------------|----------------------------------------------|
| Mathematics standardized test score quartile    | (3, 1150 <sup>†</sup> )   | 15.38*                      |                                              |
| Lowest quartile                                 |                           |                             | -4.27*                                       |
| Second quartile                                 |                           |                             | -1.06                                        |
| Third quartile                                  |                           |                             | -1.46                                        |
| Highest quartile                                |                           |                             | 5.83*                                        |
| Reading standardized test score quartile        | (3, I I 40 <sup>†</sup> ) | 24.05*                      |                                              |
| Lowest quartile                                 |                           |                             | -5.24*                                       |
| Second quartile                                 |                           |                             | -3.40*                                       |
| Third quartile                                  |                           |                             | -0.38                                        |
| Highest quartile                                |                           |                             | 7.53*                                        |
| Final high school GPA (no honors/<br>AP weight) | (3, I070 <sup>†</sup> )   | 26.00*                      |                                              |
| 0.00-1.00                                       |                           |                             | -2.87*                                       |
| 1.01–2.00                                       |                           |                             | -7.78*                                       |
| 2.01-3.00                                       |                           |                             | -1.87                                        |
| 3.01-4.00                                       |                           |                             | 6.54*                                        |

Note: The test statistic used, the second-order Rao-Scott adjusted  $\chi^2$  (Rao & Scott, 1984), has an F ratio distribution. It is used to properly account for the design effects that arise from the use of cluster sampling (at the school level) employed by ELS, as opposed to the simple random sampling assumed by the analogous and more familiar Pearson  $\chi^2$  test for independence.

<sup>a</sup>Positive values for adjusted standardized residuals indicate overrepresentation among music students; negative values indicate underrepresentation. Significant *p* values for adjusted standardized residuals indicate a significant contribution to the significance of the overall test statistic.

<sup>†</sup>Indicates quantities that have been rounded to comply with the authors' license for the restricted-use ELS data set.

\*p < .005.

or other advanced degree were significantly overrepresented. The level of overrepresentation among music students was positively related to the parent's level of education, with the odds ratio indicating that music students were 1.66 times more likely to be children of a parent who had attained at least a bachelor's degree than they were to have parents with a high school diploma or less.

Academic achievement, as measured both by standardized tests administered specifically for the ELS study and by a student's transcript-reported unweighted GPA, also were found to be significantly associated with music ensemble participation. Students scoring in the highest quartile on math or reading standardized tests were significantly overrepresented among music students, while those students scoring in the lowest quartile in math scores and the two lowest quartiles in reading scores were significantly underrepresented. High school GPA was similarly skewed for music students. Students with high school GPAs between 3.01 and 4.0 were significantly overrepresented among music students, while those with GPAs between 0 and 2.0 were significantly underrepresented.

#### Discussion

The current study sought to provide an updated demographic profile of high school music ensemble students in the United States as a way to provide educators, administrators, and policy makers with a clear idea about whom music education currently serves. One of our key findings was that 21% of high school seniors in 2004 participated in school ensembles. This participation percentage might seem high given the current conventional wisdom in the field that suggests we teach a smaller percentage of high school students (e.g., Fowler, 1996; Shuler, 2010; Williams, 2007). It should be noted, however, that this represents an almost 10% decline in music participation as compared to Stewart's (1991) finding that 30.9% of high school seniors in 1982 participated in music performance classes. This decline might be explained by a reduction in the number of music electives offered in high schools, a decrease in schools offering music, an increased focus on "tested" subjects, and/or changing student needs and interests (see Abril, 2009b; Abril & Gault, 2008). It is important to note, however, that the current study used a self-report measure of music participation rather than reviewing school transcripts, as Stewart (1991) had; it also is possible that at least a portion of the observed decline may be due to this measurement difference. Nevertheless, if the decline we observe proves to be a trend, music educators must consider carefully ways they can attract a greater number of students into music programs through innovative course offerings. Further research is needed to sort out these and myriad other plausible explanations for the observed music participation decline.

We found that 61.1% of music students in the class of 2004 were female. This represents almost no difference from Stewart's (1991) finding that 61.4% of music students in the class of 1982 were female. According to Stewart, the female overrepresentation and concomitant male underrepresentation was explained by the gender disparity in vocal and choral music courses. Given that our grouping variable did not distinguish between choral and instrumental participation, we cannot confirm her explanation. However, given the considerable research attention spent on the male absence in choral music ensembles (Freer, 2010), it is plausible that her explanation holds. Further research on the ELS data set to examine the underlying student transcripts could help explain the gender disparity we found.

On every dimension we investigated that is associated with social strata and economic resources, music students tended to be significantly more privileged than their non-music counterparts. Music students tended to come from families with higher socioeconomic status than did non-music students. Those in the highest SES quartile were 1.71 times more likely to have participated in music than were those from the lowest SES quartile. Our finding is similar to other studies that have examined the association between SES and music participation on state- and city-wide levels (Corenblum & Marshall, 1998; Fitzpatrick, 2006; Kinney, 2008, 2010; Klinedinst, 1991). The association between SES and music participation found in this study is particularly noteworthy when one considers that the SES variable we investigated derives from a continuous measure determined by an algorithm<sup>3</sup> accounting for family income, parental occupational prestige, and parental level of education. The variable analyzed here—unlike the commonly used proxy eligibility for free or reduced price lunch, which only identifies students at the lowest levels of family income (Harwell & LeBeau, 2010)—adequately stratifies the middle from the upper classes.

Findings from the current study corroborate Stewart's (1991) finding that students from lower socioeconomic statuses were less likely to participate in music than were their more economically advantaged peers. The SES and music participation association is particularly relevant for studies that seek to compare music to non-music students, especially in light of Southgate and Roscigno's (2009) finding that music study only slightly moderates the effect of SES as a predictor of academic achievement. The association between socioeconomic status and music participation demonstrated in this study and prior research may cast doubt on studies that have sought to compare music students and non-music students without at least adequately controlling for differences in SES. The present study lends support to Kinney's (2008) assertion that research studies in which significant differences between music and non-music students are found might be more indicative of music students' higher average SES than any effect of music students should measure and control for the SES disparities between these groups.

Beyond the music education research community, our findings related to SES have implications for music educators and school administrators, as well. Recognizing that school music programs currently underserve students of lower socioeconomic status, music educators and administrators might develop initiatives to reduce the financial obstacles to school music participation. Lower socioeconomic status students may be dissuaded from participating in instrumental music due to the necessity of acquiring an instrument. Schools and teachers wishing to remove this obstacle could invest in a set of school-owned instruments to be issued at low or no cost to students in need. Other than the obvious cost of acquiring an instrument for band or orchestra, other financial costs of continued music study that affect both instrumental and choral ensembles exist: transportation to rehearsals and concerts that occur outside of the school day and private instruction, to name just two. Establishing a need-based scholarship fund for these incidental costs could ameliorate the obstacles of recruiting students of lower economic means into music programs. Ultimately, music educators and administrators need to determine whether the disparities we observe at a national level are exhibited locally in their own programs, and if they are, what mechanisms might be causing the phenomenon in their school. Programs whose populations are not representative of their school population may require more sweeping reforms than those programs comprising students who are representative of the school population.

The association between academic achievement and music participation is another important implication arising from this study. While music advocates continue to search for evidence that music study raises academic achievement and test scores, research to date has been unable to demonstrate a causal link between music study and increased academic achievement. This study, constructed as a cross-sectional analysis of longitudinal data, cannot determine anything causal about academic achievement and music participation. Nonetheless, the association between music participation and academic achievement as measured by both GPA and test scores found in this study suggests that academically superior students may be drawn to music. Additionally, the achievement–music study association may be another artifact of music students' higher overall levels of SES. Further research examining nationally representative educational data longitudinally could help to address these questions.

The current study did not find significant associations between music participation and family composition. This differs from Kinney's (2010) finding that urban students from dual parent/guardian homes were more likely to enroll in band. The difference might be explained by the fact that Kinney focused on band programs in one urban school district, whereas the current study is nationally representative and also includes participation in school choirs and orchestras.

We found that parental educational achievement is an important dimension where a disparity exists between music and non-music students. Music students tend to come from families with greater levels of parental educational attainment than do their nonmusic peers. This finding is important when considered in light of the results from the National Endowment for the Arts' (2009) Survey of Public Participation in the Arts showing that highly educated adults are more likely to patronize the performing arts than those with less educational attainment. It is likely that adult patrons of the arts are precisely the kind of parents who encourage their children to take elective arts classes in secondary schools, and parental patronage of the arts and its potential correlation with student music participation is an important question for further research.

The association we found between native language and music participation is an important issue where future inquiry in music education research is needed. Native English-speaking students were found to be more than twice as likely as native Spanish-speaking students to have participated in large ensemble courses. Given that many native Spanish speakers in the United States are classified as English language learners at one point or another and these students are often tracked into remedial courses or required to take additional courses in math and English (Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003; Parrish et al., 2006), they may not be afforded the option of enrolling in elective courses such as music. Alternatively, these students may exhibit a lack of interest in participating in school bands, choirs, or orchestras based on the content or structure of these courses as they exist in U.S. high schools. Given these two plausible explanations, further research designed to investigate the nature of this population's underrepresentation among music students is sorely needed. Considering that the largest group of ELL students in the United States is Spanish speaking (Ruiz-de-Valasco & Fix, 2000), the underrepresentation of nonnative English speakers in music courses might be related to our finding of disparities among racial and ethnic lines as well.

Race and ethnicity were found to be significantly associated with high school music participation. Specifically, white students were found to be a significantly overrepresented group in school music ensembles and Hispanic students were found to be significantly underrepresented. The overrepresentation of white students may not come as a surprise to many music educators who have anecdotally noted that students in their ensembles are overwhelmingly white, even while the overall ethnic make-up of their school changes rapidly (Abril, 2009a). The relative absence of Hispanic students among the music student population should be of great concern to music education practitioners and researchers. This cause for concern becomes readily apparent when one considers the drastic rise in the Hispanic student population in U.S. schools, rising from 6% of all students in 1972, to 11% in 1987, and to 21% of all students in 2007 (Planty, 2009). This growth, coinciding with this group's significant underrepresentation among music students, might be a major contributor to the drop found in the nationwide percentage of students taking music when our results are compared to Stewart's (1991).

Although the present study documents the conspicuity of Hispanic student underrepresentation in music ensembles, further research is needed to understand possible causes for the relatively low number of Hispanic students in school music. It is plausible that Hispanic students do not participate in music because they are not afforded access for various reasons or that they self-select out of music ensembles because they find these courses to be of little relevance or importance. It would behoove music educators and school district leaders in music and the arts interested in addressing this participation gap to consider innovative ways to motivate Hispanic students to participate in music programs. This might include considering improved communication with parents (who may not speak English), offering alternative ensembles, and/or recruiting Hispanic music teachers to serve as role models.

Hispanic student underrepresentation in music also may contribute to the geographic disparities in music student proportions we found. The Western region of the United States had the fewest music students by proportion with only 17.7% of students in the region participating in music ensembles. The states that make up the Western region also report the highest concentrations of Hispanic students (National Center for Education Statistics, 2007).

This study found no significant association between school urbanicity and music participation. It should be noted that the ELS sample from which this study draws its data includes both public and private schools (22% of the sample members attended private schools). Some urban private schools are among the most elite and well-funded secondary schools in the nation, and so a monolithic visualization of "urban" schools as overcrowded and underresourced is not an accurate image of schools in the ELS sample; the categorization of school urbanicity is strictly based on geographic location.

Further research in music education might examine the copious amounts of data made available to educational researchers by the U.S. Department of Education's National Center for Education Statistics to address both the questions raised by this study's findings and other sociological questions raised by scholarly inquiry in music education. While we undertook a cross-sectional analysis of ELS data, further research examining these data longitudinally for music students' long-term educational outcomes—particularly if controlled for selection biases we find in the present study such as SES using the SES variables available in ELS—would be a valuable addition to the music education research literature. Although this study used a self-reported measure of student participation in band, choir, or orchestra as the primary grouping variable, future research efforts using ELS could examine the underlying sample members' transcripts, which have been collected for the study to provide a more precise portrait of music course-taking and participation.

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#### Notes

- This study analyzed data from the restricted-use ELS data set, for which the authors hold a license. To maintain data security, unweighted sample sizes reported must be rounded. Weighted sample sizes and all percentages are reported without rounding. We have indicated with a dagger (†) any quantity that has been rounded or perturbed to comply with our license for the restricted-use data.
- 2. This section presents a brief summary of the sampling and weighting procedures in the ELS study. For an exhaustive review of these procedures, see Ingels et al. (2007).
- 3. SES was determined by NCES using an algorithm accounting for family income, parental occupational prestige, and parental level of education. For more detail on this procedure, see Ingels et al. (2007).
- 4. A Carnegie unit is equivalent to a 1-year course taken one period per day, 5 days per week.

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