

Arts Education as an Investment in Lifelong Arts Participation

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(working paper)

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Abstract

The purpose of this study was to understand (1) the national uptake rates of high school arts education coursework in the United States from 1982 to 2009, and (2) the effects of school-based arts education on later adult engagement with the arts. This study used high quality national data from the U.S. Department of Education's National Center for Education Statistics to estimate enrollment percentages for high school arts courses for students in the graduating classes of 1982, 1987, 1990, 1992, 1994, 1998, 2000, 2004, 2005, and 2009. Data from the National Endowment for the Arts/U.S. Census Bureau 2012 Survey of Public Participation in the Arts were used to estimate the effect of school-based arts education on the probability of later adult engagement with the arts as patron/consumer, donor/financial supporter, and performer or art maker.

Results from analyses on uptake rates suggest that an increasing proportion of students in the United States graduate high school with at least one course in the arts (80.49% as of the class of 2009, up from 68.2% in 1982), and persistence in the arts over multiple years is also on an upward trend. Results from analyses of the effect of arts education on later engagement in the arts suggest that arts education is strongly associated with later arts participation as patron/consumer, donor/financial supporter, and performer/creator, even after controlling for respondent's household income, educational attainment, parental educational attainment, sex, and race. If one aim of arts education is to engender a lifelong connection with the arts, the results of this study suggest that this arts education is achieving this aim for many of its alumni.

EXECUTIVE SUMMARY

Purpose of the Study and Research Motivation

The purpose of this study was to understand (1) the national uptake rates of high school arts education coursework in the United States from 1982 to 2009, and (2) the effects of school-based arts education on later adult engagement with the arts. Prior research has suggested that arts education experiences are linked with later arts participation and that the proportion of adult Americans who have experienced arts education in school has been declining in recent history (Bergonzi & Smith, 1996; Rabkin & Hedberg, 2011). As past research suggesting that uptake rates of arts education have been in decline have typically relied on self-report data or survey questionnaires, the present study seeks to approach this question in a novel way—using high quality administrative data to estimate national uptake rates for arts education in American high schools.

There are many existing studies that link arts education with outcomes external to the arts (e.g., Catterall, 1997; Catterall, Chapleau, & Iwanaga, 1999; Catterall, Dumais, & Hampden-Thompson, 2012; Deasy, 2002; Hallam, 2010; Hetland, Winner, Veenema, & Sheridan, 2007; Winner, Goldstein, & Vincent-Lancrin, 2013); fewer, however, attempt to understand the success of *arts education* on *arts outcomes* (e.g., Graham, 2009; Heath, 2001; Trayes, Harré, & Overall, 2012; Winner et al., 2013). This relative lack of research on arts outcomes of arts education is likely bound up in the complexity of arts learning and the challenges inherent in measuring arts learning (Eisner, 2002). However, many arts educators believe that fostering a lifelong engagement with the arts is a key intended outcome for their students (Zakaras & Lowell, 2008). The present study was designed to specifically assess an arts-related outcomes of arts education to contribute to this small, but critically important, area of inquiry in the arts research literature.

Overview of Study Methodology

Arts education enrollment trends. High quality national data from the U.S. Department of Education's National Center for Education Statistics were used to estimate enrollment percentages for high school arts courses for students in the graduating classes of 1982, 1987, 1990, 1992, 1994, 1998,

2000, 2004, 2005, and 2009. These datasets feature nationally representative collections of multiple tens of thousands of complete high school transcripts per cohort. For each cohort, the proportion of students who had arts coursework appearing on their transcripts was calculated to generate nationally representative estimates of arts education uptake rates, both overall and disaggregated into the main arts disciplines of visual art, music, theater, and dance. Specific details on the identification of arts students from among the cohort populations and the estimation of enrollment percentages is available in the Research Methodology appendix to this report.

Effect of school-based arts education on later arts engagement. The effect of school-based arts education on later adult engagement as creator, patron, or financial supporter of the arts study was estimated through a quasi-experimental research design, using observable covariates to adjust for selection bias (Murnane & Willett, 2011). Adults who had school-based arts education were identified from the 2012 Survey of Public Participation in the Arts data on the basis of their self-reported answers to the questions in Module E of the questionnaire. Specific details on the covariates, the estimation methods, and the models employed is available in the Research Methodology appendix to this report.

Key Findings

Arts Education Uptake in High Schools. Contrary to many reports in the popular press painting a dire picture for arts education in the United States, this analysis finds that, in the public high schools, enrollment in arts education is healthy and generally on an upward trend. [Figure 1](#) shows that in 2009, **80.49% of all students** enrolled in at least one high school arts course during their high school careers, up from just 68.2% of students enrolling in at least one arts course in 1982. Visual art was pursued by **57.17% of all students** in 2009, music by **34.43% of all students**, theater by **13.5% of all students**, and dance by **4.43% of all students**. With the exception of music, where enrollment was flat, these numbers all represent significant increases from earlier cohorts.

Persistence in High School Arts Education. Again, and contrary to the popular perception that the arts are in decline, persistence in arts courses increased over the three-decade time period examined in this study. [Figure 2](#) shows persistence rates of students enrolling in visual art, dance, or theater courses. In

2009, **23.67%** of students enrolled in 2 or more years of these courses, **10.94%** enrolled in 3 or more years of these courses, and **5.23%** enrolled in four or more years of courses in visual art, dance, or theater. These numbers all represent significant increases over time. [Figure 3](#) shows previously reported (Elpus, 2014) persistence rates for music courses, which also increased substantially over time time frame examined. In 1982, just **5.42%** of students persisted through four years of music courses in high school, by 2009, this number was up to **9.43%**. Persistence rates for 2+ and 3+ years of music were similarly up over the time period examined in the study.

Racial/Ethnic Composition of Arts Students. For most cohorts examined, the racial and ethnic composition of arts students was not representative of the student population as a whole. White students tended to be overrepresented among arts students while other racial/ethnic groups tended to be underrepresented. [Figure 4](#) shows the racial/ethnic composition of visual art, theater, and dance students over time and [Figure 5](#) shows the racial/ethnic composition of music students over time.

Effects of School-Based Arts Education on Later Engagement with the Arts. Adults who had experienced arts education in school were significantly more likely to be engaged with the arts as adults, even when controlling for household income, sex, race/ethnicity, and educational attainment. Former arts students were **78% more likely to attend classical music or opera, 81% more likely to attend live theater, 78% more likely to attend live ballet, and 140% more likely to attend other live dance** than were adults who lacked arts education in school. As adults, former arts students were **4.58 times more likely to play an instrument, 3.64 times more likely to sing, 2.34 times more likely to take photographs as an artistic endeavor, and 2.69 times more likely to create non-photographic visual art** than were adults who had not pursued school-based arts education. Perhaps most strikingly, former students of school-based arts education were **8.17 times (717%) more likely** to donate to arts and cultural organizations as adults than were adults without school arts education in their past.

Disparities between estimates of arts education in the SPPA and transcript data. Estimates from the 2012 Survey of Public Participation in the Arts (SPPA) indicate that **36.95%** of adults in the United States reported having participated in some school-based arts education. By arts discipline,

estimates from the SPPA suggest that **29.63%** of adults were in school music performance or appreciation, **17.25%** of adults were in school visual art creation or appreciation, **4.39%** of adults were in school photography or film, **5.5%** of adults were in school theater, and **6.5%** of adults were in school dance.

Generally speaking, the SPPA estimates of adults who had participated in school-based arts education fall below (and, in some cases, far below) the estimates generated from NCES transcript data. There are several possibilities that may explain these disparities, which may be operating in isolation or in tandem: (1) The SPPA is designed to be representative of the entire non-institutionalized U.S. adult population, including people who may have never attended a high school or who attended high school well before the 1982 graduating cohort. By nature, the NCES data are designed to be representative of the population of high school students. The differences in the populations each data collection effort represents may account for some or all of the differences in estimates. (2) Adults for whom arts education was not a central focus of secondary schooling may not answer affirmatively when asked if they participated in school-based arts study because they do not feel their limited involvement meets some internally held psychological threshold for identifying as an arts student. This would cause the SPPA to underreport arts education experiences as compared to transcript data. (3) Some respondents, again, possibly those for whom arts education was on the periphery of their school experience, may simply have recall error when asked to self-report their involvement, leading to underreporting bias in the SPPA. Other possibilities for the disparities exist, and it is difficult within the scope of the present investigation to determine which, if any, of these possibilities causes the SPPA estimates of arts education experience to fall short of transcript data estimates. Further research to understand if self-report questions of arts education participation tend to underestimate uptake as compared to school administrative data is warranted.

Conclusions

The present study provides evidence that the state of school-based arts education in American schools is somewhat stronger than many people might estimate and that arts education does have

measurable, positive arts related outcomes. Results from analyses on uptake rates suggest that an increasing proportion of students in the United States graduate high school with at least one course in the arts (80.49% as of the class of 2009, up from 68.2% in 1982), and persistence in the arts over multiple years is also on an upward trend. Results from analyses of the effect of arts education on later engagement in the arts suggest that arts education is strongly associated with later arts participation as patron/consumer, donor/financial supporter, and performer/creator, even after controlling for respondent's household income, educational attainment, parental educational attainment, sex, and race. If one aim of arts education is to engender a lifelong connection with the arts, the results of this study suggest that this arts education is achieving this aim for many of its alumni.

Arts advocates, working artists, arts administrators, and arts educators should recognize the central importance of school-based arts education in creating an arts-engaged populous. Nearly two decades ago, Charles Fowler (1996) argued that “[t]he arts, like other subjects in the curriculum of American schools, are affiliated with the schools’ important responsibility to pass on the civilization—in this case, our rich and rewarding cultural heritage—to the next generation” (p. 3). Results from the present study should suggest to stakeholders that improvements in the status, availability, and uptake of arts education in the nation’s schools will likely lead to greater democratized art making, greater support for artists and arts organizations, and and greater engagement in the arts by adults. The increasing uptake rates of high school arts courses over the three decade period between 1982 and 2009 are heartening, but with an understanding of just how much school-based arts education is an investment in the future artistic engagement of America’s youth, the important place of the arts in American education should be celebrated, protected, and advanced.

INTRODUCTION

Arts education philosophers contend that the value of arts education to society is directly and inextricably linked to the value that society places on the arts themselves. This basic tenet is held in common even by arts education philosophers with widely diverging viewpoints on nearly every other function and facet of arts education. Take, for example, the case of Bennett Reimer and David Elliott, often positioned as professional foils in the world of music and arts education philosophy and theory. Reimer, widely considered one of the foremost thinkers in aesthetic education philosophy, contends that to understand the value of music *education* to society, one must first understand the value of *music* to society, or as Reimer writes, one must understand “the comprehensive and satisfying incorporation of music into people’s lives” (Reimer, 2003, p. 12) to understand why an aesthetic education in music is important. David Elliott, and his coauthor Marissa Silverman, founders of a philosophical stance known as “praxialism” which stands in contrast to much of Reimer’s aesthetic education thinking, fundamentally agree on the point that music’s value to society is part and parcel of the value of music education, however: “music, music education, and [community music] are valuable sources of human insight. . .but if we make music only in school. . .then music making and listening fall short of their enormous potential to improving communities and societies” (Elliott & Silverman, 2014, p. 52).

Thus, philosophers in music education have come to a rare point of agreement on the fundamental connection of society’s valuing of the arts being the foundational element of society’s valuing of arts education. If society finds the arts important, so too should society find the education of the next generation in the arts equally important. Key to this idea is a linkage—the connection between the making, doing, and consumption of art *in the world* with the making, doing, and consumption of art in educational contexts. But what is the directional nature of this linkage between the real world experience of the arts and school- and community-based education in the arts? Does society value the arts and thereby make provision for arts education in schools and communities, or are students educated in the arts more likely to become art making and art consuming members of society later? Indeed, many arts

educators believe that fostering a lifelong engagement with the arts is one of their key intended outcomes for arts students (Zakaras & Lowell, 2008).

The study reported here seeks to build on the existing research base and approach this question by revisiting this topic using the most popular data source for answering it — the National Endowment for the Arts' periodic Survey of Public Participation in the Arts (SPPA), the largest nationally representative data collection that gathers information from American adults both on their current participation in and consumption of the arts as well as asking them about their childhood backgrounds in arts education. In addition, this study seeks to contextualize the data provided by the SPPA with other federal sources of data on childhood participation in school-based arts education—namely, the various High School Transcript Studies and Longitudinal Studies of education conducted by the National Center for Education Statistics (NCES), within the U.S. Department of Education Institute for Education Sciences.

Why the elaboration beyond the SPPA? Prior research using SPPA data has suggested that uptake of arts education may be declining over time—a precipitous situation if the theorized link between childhood arts education and later lifetime arts participation holds true—but this data is entirely based on the recollections of respondents who are in the midst of answering questions for the much larger questionnaires of the U.S. Census Bureau's Current Population Study. By examining NCES transcript data, we can construct an objective measure of the national trend in participation in and exposure to arts education—at least in high school—without the limitations inherent in self-report data.

The dual purposes of this study, therefore, were to: (1) examine the value of childhood arts education experiences on later adult engagement with the arts as creator or consumer, and (2) to understand trends in arts education course taking among graduating seniors in U.S. high schools in the nearly three decade period from 1982 to 2009.

The remainder of the report is structured as follows: First, I provide a brief overview of some of the extant research from disparate academic fields examining linkages between arts education and later arts participation, as well as reviewing the limited, but growing, research base on the demographics of arts students in the nation and the characteristics that predict arts education uptake. Next, I report on the

results of two new studies, one examining SPPA data to understand the relationship between childhood arts education and adult arts participation, and the other using NCES data to examine uptake trends in high school arts education from 1982 to 2009, a time period similar to that covered by the current and previous waves of the SPPA. Finally, I compare and contrast the uptake findings from each data source and suggest next steps for research and policy.

Context for the Study

Existing research examining national arts participation data from the National Endowment for the Arts Surveys of Public Participation in the Arts (SPPA) has suggested two important conclusions for the value and status of arts education in the United States: Firstly, that arts education experience is the strongest predictor of future engagement with the arts and secondly, that the proportion of adult Americans who have experienced arts education has been declining over the past thirty years (Bergonzi & Smith, 1996; Rabkin & Hedberg, 2011). Taken together, these conclusions are troubling, both for arts educators and the art making community at large.

However, in recent empirical work using data from the National Center for Education Statistics, Elpus (2014) found that the proportion of students pursuing music coursework in American high schools had not declined, but instead remained flat, during the period between 1982 and 2009. The discrepancy implied by the Elpus (2014) results to the earlier analyses of SPPA data may be due to differences in data collection methods: Elpus (2014) used administrative high school transcript data for nationally representative cohorts of students in American schools, while the SPPA asked adults to recall and self-report their childhood arts education experiences.

There is a need, then, for research to understand whether the link between arts education experience, particularly school-based arts education, has remained consistently strong with more recently collected data and a need to understand more completely the trends in school-based arts education participation over recent decades using data that is perhaps more well suited than the SPPA to capture school-based arts education enrollment. The present study was designed to fill this need.

Related Prior Research

Periodically, the U.S. Census Bureau conducts the Survey of Public Participation in the Arts (SPPA) on behalf of the National Endowment for the Arts (NEA). The SPPA gathers data from adults in the United States aged 18 and older on their participation in, attendance at, and preferences for various benchmark artistic pursuits. The SPPA has been administered since 1982, and since 2002 has been administered as a supplement to the Census Bureau's Current Population Survey. In addition to detailed reports of findings disseminated by the NEA, raw data are made available to researchers for secondary analyses. To date, SPPA data have been used in analyses from the disparate academic fields of economics, sociology, and music education, among others. As the present investigation also relies in part on SPPA data from the most recent administration (2012), I present here a brief review of past arts education and arts participation research that has relied on SPPA data. Following that, I present an overview of research on related topics using data from other sources.

Research Using SPPA Data

Bergonzi and Smith (1996) conducted the first large-scale analysis of SPPA data to answer arts education research questions. Closely related to the purposes of the present study, Bergonzi and Smith sought to determine the effect of childhood arts education on later engagement with classical music, jazz, opera, musical plays, non-musical plays/dramas, ballet and other dance, poetry, novels or short stories, and the visual arts. They found that childhood arts education was a strong predictor of later engagement in these benchmark arts activities, and that prior engagement with arts education moderated more than half of the differences in arts attendance predicted by socioeconomic status. That is, adjusting for arts education *reduced* the relationship between socioeconomic status and benchmark arts attendance. Although arts attendance and creation in various forms were strongly predicted by childhood arts education, Bergonzi and Smith found that performing (as a musician, actor, or other performing artist, whether for recreation or occupation) was not predicted by arts education. They found this result to be curious, as the predominant mode of arts education in the United States then (as now) was performance-

focused music education. As may be reasonably assumed, Bergonzi and Smith found that socioeconomic status was strongly, positively correlated with the amount of arts education one received in childhood, and this relationship persisted both for school-based and community-based arts education, though the relationship was stronger for community-based arts education.

Mizell (2005) summarized arts education variables from three administrations of the SPPA (1982, 1992, and 2002). Broadly speaking, Mizell's analysis suggests that a declining proportion of American adults report exposure to arts education across the three administrations of the SPPA.

Economists, too, have addressed questions related to arts participation in the United States, often using SPPA data. Much of this work is summarized by Seaman (2006), who concludes that the research literature offers few concrete answers despite a four-decade history and the recent incorporation of more sophisticated analyses. Seaman contends that part of the opaqueness of estimating demand for the performing arts stems from the relationship of arts participation and consumption with covariates that are not typically examined in other economic analyses: arts education, as separated from other formal education, gender, socialization into arts appreciation, and sexual orientation among them. Seaman notes other limitations in the literature—mainly, the a majority of the studies use as data sources either surveys of audiences as members (thus suffering from self selection biases) or surveys of the broader population, like the SPPA, which may not adequately capture the effect of pricing on participation and attendance. Seaman suggests that the collinearity between educational level and income is another key limitation facing econometric analyses of arts demand—it is difficult for economists to disentangle the individual contributions of education and income as predictors of arts participation because they are so closely linked. The challenge notwithstanding, there is a general consensus that educational level, rather than income, is the most predictive characteristic determining arts participation, though, as Seaman reports, some extant studies have in fact come to the opposite conclusion.

Borgonovi (2004) used the 2002 wave of the SPPA to estimate whether and how the likelihood that members of the population would attend various performing arts events varied as a function of certain characteristics. Borgonovi's chief innovation was the linking of data from the National Center for

Charitable Statistics external to the SPPA—specifically, (1) the number of performing arts organizations located in the respondent’s county of residence, and (2) the proportion of support these organizations receive from donations and grants, as opposed to ticket revenue. Borgonovi theorizes that greater support from donations would tend to reduce per person admission prices to these events, and her estimates therefore hinge on how much credence is given to this theory. Borgonovi found that previous art education is the primary personal characteristic predictive of performing arts attendance, even when controlling for her proxy measures for cost of attendance. Interestingly, Borgonovi reports that controlling for cost of attendance has the net effect of reducing the influence of socioeconomic status, race/ethnicity, sex, and occupation on performing arts attendance. She notes, however, that arts education is not equally distributed among the population and that since arts education is art-specific, but complementary in that participation in one kind of arts education generally increases consumption of other art forms, a wide range of arts education experiences should be offered in schools.

Related Research Using other Data Sources

Recently, there has been an increase in published research examining demographic issues in arts education, particularly in the United States. As the field of music education has the most mature research enterprise from among the various arts disciplines, much of the published arts education demographic work to date focuses on music education.

Fitzpatrick (2006) and Kinney (Kinney, 2008; 2010) locally investigated the demographics of urban music students in one metropolitan area of the American midwest. Fitzpatrick (2006) sought to understand whether instrumental music students outperformed their non-music peers on the standardized Ohio Proficiency Test. By taking a retrospective view of test scores and demographic data collected prior to students eventual enrollment in music education, she found that “[s]tudents who would eventually become high school instrumental music students outperformed non instrumental students of like socioeconomic status in every subject and at every grade level” (p. 78). She concludes that instrumental

music courses were elected by students who were already academically superior to their peers who would eventually elect not to pursue instrumental music, potentially challenging the long believed aphorism that “music makes you smarter.”

Kinney (2008) extended and refined Fitzpatrick’s (2006) work and came to similar conclusions: students who were already academically superior took up instrumental music more than did their less academically achieving peers. However, Kinney (2008) found this did not extend to choral music: choral students had initially *lower* achievement scores than instrumental students and the gap remained persistent. Kinney (2008) could not, however, discount the potential for higher socioeconomic status as a prerequisite for engagement in instrumental music (with its attendant need of securing or renting an instrument and often pursuing private instruction as an adjuvant to school-based ensemble instruction) as a cause for the disparity. That is, based on the data available to him, Kinney could not rule out SES as a cause for the disparities between instrumental and choral students. In later work, Kinney (2010) sought to understand some of the non-musical characteristics that were associated with election of middle school instrumental music in a Midwestern urban district. He found that socioeconomic status predicted *retention* in instrumental music—that is, continuation beyond initial years of participation—but not the initial enrollment. Family composition (single- vs. dual-parent households) and prior academic achievement were both significant predictors of initial enrollment and election.

Though Fitzpatrick and Kinney’s work raises interesting questions about the characteristics of students who elect music education, both studies focused on one metropolitan area. Elpus and Abril (2011) published the first comprehensive, national demographic profile of students pursuing ensemble-based music education in the United States. Using data from the Education Longitudinal Study of 2002 (ELS), a project of the National Center for Education Statistics, a center within the U.S. Department of Education’s Institute for Education Sciences, they compared the population of seniors from the class of 2004 who participated in their school’s bands, choirs, or orchestras to the general population of seniors graduating in 2004. They found that, compared to the overall population, music ensemble students were more likely to be female, more likely to be White (and, commensurately, less likely to report Hispanic

ethnicity), more likely to come from the highest socioeconomic status quartile, more likely to speak English as a native language, and more likely to have parents with advanced degrees than were their non-music peers. ^{□1}

Seeking to more accurately understand the nature of the gender disparity that Elpus and Abril (2011) found, Elpus (2015) examined the male-to-female enrollment ratios in American high school bands, choirs, and orchestras. Using nationally representative high school transcript data for ten graduating cohorts of American high school seniors spanning the timeframe from 1982 to 2009, Elpus (2015) determined that females outnumbered males among the students enrolled in all three music performance experiences. As might be expected, he found the greatest disparity in choral music, where the roughly 70% female to 30% male enrollment statistic was relatively stable across the entire time period examined. Interestingly, and unexpectedly, females outnumbered males in the instrumental ensembles as well, though by much smaller margins and with greater variability.

RESEARCH QUESTIONS & DATA SETS

Research Questions Guiding the Study

1. From 1982 until 2009, what percentage of public and private high school students were enrolled in at least one year of any kind of arts course (music, dance, drama, film, or visual art)?
2. From 1982 until 2009, what was the proportion of enrollment in public high school arts courses by race/ethnicity?
3. Controlling for factors related both to selection into arts education and later adult arts participation, what is the effect of various forms of school-based arts education on the following kinds of engagement with the arts?
 - a. Adult attendance at “benchmark” arts events (attending live music, theater, dance, film, visual art, or literary events)
 - b. Creation or performance of art in various forms (musical, theatrical, choreographic, cinematic, visual or literary)
 - c. Donation of money, goods, or services to arts or cultural organizations

Data Sources

The present examination makes use of several high quality, nationally representative data sets to answer the research questions proposed above. The first research question makes use of data from the 2012 administration of the *Survey of Public Participation in the Arts* (SPPA) and the second research question is answered using data from ten separate High School Transcript Studies.

Survey of Public Participation in the Arts. Since 1982, the National Endowment for the Arts has sponsored a periodic nationwide data collection effort to ascertain the extent and nature of artistic participation, patronage, and creation by the American people. That effort, the *Survey of Public Participation in the Arts* (SPPA) is administered by the U.S. Census Bureau as a supplement to the monthly Current Population Survey (CPS). In 2012, questions comprising the SPPA were asked of a

nationally representative sample of 35,735 U.S. adults, aged 18 and over. Each respondent answered one of two “Core” questionnaires, the first of which was designed to permit trend analysis with previous waves of the SPPA and the second of which was designed to ask updated questions reflecting advances in the state of the arts. In addition to answering one of the two Core questionnaires, respondents were randomly assigned to answer two of the five possible questionnaire modules, each of which was focused on a specific area of interest. This resulted in each respondent answering the questions on either Core 1 or Core 2 plus two additional modules. The modular design of the SPPA permits greater data collection from larger numbers of respondents while reducing the overall response burden for each individual respondent.

For the present study, arts education variables were drawn from Module E of the SPPA, which was administered to 9,482 sample members. Benchmark arts attendance variables were drawn from either Core 1, to which 18,011 sample members responded, or from Core 2, to which 17,635 sample members responded. To increase the sample sizes for the analyses reported here, if a similar outcome question was asked of Core 1 and Core 2 respondents, respondents who answered either version of the question were included in the analysis. Although there were slight differences between the Core versions in the wording of the questions, the benefit of increased sample size was considered an acceptable trade off in that it outweighed the potential confounding nature of slightly different question wording. Specific sample sizes for each analysis are reported with each set of results.

High School Transcript Studies. Though some arts education participation variables are asked of certain SPPA respondents, the SPPA was not designed to accurately measure trends in school-based arts education participation and enrollment. To get a clearer sense of the status of enrollment in various school-based arts education experiences, I supplement the SPPA data with data from the National Center for Education Statistics (NCES), a center within the U.S. Department of Education’s Institute for Education Sciences.

For the present study, I make use of ten separate High School Transcript Studies (HSTS), nationally representative collections of complete high school transcripts for various cohorts of American students from both the public and the private schools. The HSTS efforts are periodically undertaken by

NCES as part of the Center's longitudinal studies of education and also as ancillary data collections to the National Assessment of Educational Progress (NAEP), which is also referred to as "The Nation's Report Card." All HSTS are conducted using similar procedures (Alt & Bradby, 1999), which ensure that even though each collection is cross-sectional, the data can be pooled to understand longitudinal trends. For each HSTS, school administrations release transcripts directly to the NCES, where researchers and contractors code the transcripts and make the transcript data available, under license, to the broader research community.

The following graduating class cohorts are included in this study: 1982 ($n = 15,940$), 1987 ($n = 34,030$), 1990 ($n = 21,520$), 1992 ($n = 16,490$), 1994 ($n = 25,530$), 1998 ($n = 25,210$), 2000 ($n = 23,480$), 2004 ($n = 16,200$), 2005 ($n = 29,850$), and 2009 ($n = 41,220$). Data from the 1982 cohort were drawn from the NCES High School and Beyond Study (HS&B), data for the 1992 cohort were collected as part of the National Education Longitudinal Study of 1988 (NELS), and data for the 2004 cohort were from the Education Longitudinal Study of 2002 (ELS). All remaining cohorts (1987, 1990, 1994, 2000, 2005, and 2009) had transcripts collected as part of the NAEP. Data preparation, detailed in the methodological appendix to this report, allowed me to estimate the proportion of each graduating class who had enrolled in one or more arts courses.

RESULTS

Arts Enrollment Trends, 1982-2009

Students in the United States are offered a variety of arts education experiences at the high school level, nearly all of which are elective in some form or another. While many states and localities have established minimum arts education requirements for high school graduation, no state has a prescription for any specific discipline of arts coursework that must fill these requirements. Thus, there is competition for the election of arts coursework among the various arts themselves for the required year or years and competition from other elective areas for years beyond the requirements. In terms of courses offered and available to students in the United States, the National Center for Education Statistics has reported that music is by far the most available of any arts education opportunity in the U.S., followed by visual arts, then theater, and finally dance (Parsad & Spiegelman, 2012).

Nationwide Arts Enrollment Estimates

[Figure 1](#) is a “slopegraph” (Tuft, 2006) that presents nationwide arts enrollment estimates for students graduating from the country’s public and private schools in the years 1982, 1987, 1990, 1992, 1994, 1998, 2000, 2004, 2005, and 2009. The estimated percentages reported reflect the proportion of members in each cohort who graduated with at least one year of coursework classified in the four arts areas of visual art, music^{□2}, theater, and dance. Students who had at least one year of coursework in any of the arts areas are included in the estimates labeled “Any Arts,” but, due to some students enrolling simultaneously in more than one arts area being counted only once in the “Any Arts” estimate, the “Any Arts” estimates are not the sum totals of the estimates for each individual arts discipline.

Visual art

As seen in Figure 1, visual art is the most popular arts education course elected in high school, and has been so over the entire duration of the time period under examination in the present study. The proportion of students who enrolled in at least one visual arts course by the time of high school

graduation has been generally on an upward trend, with 57.17% of the class of 2009 graduating with at least one visual arts course in 2009, up from only 47.08% of the class of 1982.

Music

Detailed music enrollment estimates for the period under examination in the present study have been previously published by Elpus (2014), and these earlier estimates are presented here for completeness. Briefly, Elpus (2014) found that enrollment in music remained relatively stable from 1982 to 2009, with roughly 34% of all students graduating high school with at least one course in music (performance or non-performance) appearing on their high school transcript. That the proportion of students electing high school music is lower than the proportion of students electing high school visual arts is an interesting phenomenon, particularly when considered in light of the greater availability of music courses across the nation's schools (Parsad & Spiegelman, 2012) and the higher enrollments that can be accommodated by music ensemble courses, which can enroll up to 100 students (and, in some schools, more) per individual course section. The somewhat lower enrollment of high school students in music courses as compared to visual arts courses might be explained by a perception among students and parents that some prior experience or training in music is a necessary prerequisite for participating in high school music. Put another way, perhaps students with little to no prior arts experience feel that a "beginner" can thrive in high school visual art programs where they may not thrive in high school music programs. Further research in this area might help explain the lower uptake of high school music when compared to its greater availability than high school visual art.

Readers interested in the complete breakdown of music enrollment numbers by race and special education classification status are directed to the previously published article appearing in the *Journal of Research in Music Education* (Elpus, 2014) from which the music enrollment estimates presented here first appeared.

Theater

The election of high school theater courses by students in U.S. public and private schools was on a steady, yet measured, upward trend during the three decade period under study. This is most likely due to the increasing availability of curricular theater programs—traditionally, theater has been available almost universally in the high schools through extracurricular productions of plays and musicals. As theater education has more recently become a recognized area in colleges and universities, and a recognized area of teacher certification in the fifty states, it is perhaps unsurprising that there are still relatively few students electing curricular theater and that the numbers of students electing curricular theater study is rising.

Dance

Dedicated instruction in dance is the least commonly available art form in American public secondary schools, with only 14% of those schools reporting availability of dance education in 1999-2000 and only 12% of those schools reporting the availability of dance education in 2008-2009 (Parsad & Spiegelman, 2012). Thus, it is unsurprising that the lowest uptake rates in high schools are for dance: only 2.28% of students in the class of 1982 took a formal course in dance during their high school careers. However, election of formal, school-based dance education is increasing in the nation: the highest reported uptake rate in the cohorts examined was over 7% in 1998 and this declined only to 4.43% in 2009, commensurate with the decrease in availability of secondary school dance courses across a similar time frame.

Dance adeptly straddles a curricular divide in U.S. schooling: in most places, dance education is rightfully considered a form of performing arts education, and in others, the intensely somatic nature of the art is recognized, equally rightfully, as a form of physical education. As dance educators seek to reverse the decline in the availability of dance in the public schools, and continue the enrollment rates on an upward trend, embracing dance education as both arts and physical education may be an important

plank to support. Positioning dance courses as filling both arts education and physical education course mandates is perhaps a fruitful policy avenue to pursue.

Persistence in the Arts

Though understanding overall uptake rates of the various arts courses, as presented above, is both useful and instructive, it is also valuable to understand the rates at which American students *persist* in high school arts education—that is, the extent to which students who take any of the arts education courses offered to and/or required of them continue to study their chosen art form(s) for more than one school year. While mandates for arts education coursework will tend to increase uptake rates for students who are classified as arts students on the basis of taking at least one course, students are rarely required to pursue more than one year of arts education coursework, making the persistence rates an indicator of the health of arts education in the absence of mandated coursetaking.

Visual Art, Theater, and Dance

Figure 2 shows estimates of student persistence in visual art, theater, or dance courses. The “1+ years” row shows the percentages of students in each cohort who had enrolled in at least one visual art, theater, or dance course, while the remaining rows show the percentages of students in each cohort who had enrolled in two or more, three or more, and four or more³ years’ worth of visual art, theater, or dance courses, respectively. As might be expected given that most graduation requirements for high school arts courses stipulate that students must take only one year of an arts course, there is a steep drop off between the proportion of students who took at least one course and the proportions who persisted for two, three, or four (or more) years of visual art, theater, or dance.

Despite the large difference between the proportion of students persisting for more than one year and those taking only one visual art, theater, or dance course, [Figure 2](#) shows clearly that the proportion of students who have persisted has been on a considerable upward trend from 1982 to 2009. While only 1.71% of students in the class of 1982 persisted for four or more years of visual art, theater, or dance

courses, the percentage of 4+ year persisters more than tripled by 2009, and the 2+ and 3+ year persister percentages more than doubled. The general trend in these courses has been up over the three decades examined: many more students took at least one arts course and many more students took more than one arts course in 2009 than they had in 1982.

Music

As above, detailed music enrollment figures were not part of the present study, because these have already been reported in Elpus (2014). [Figure 3](#) presents the estimates from the prior study. That study showed that persistence in music courses for four years nearly doubled across the time period: 5.42% of students graduated high school with four or more Carnegie units of music appearing on their high school transcripts in 1982 and 9.43% of students in the graduating class of 2009 had attained the same number of credits in music by high school graduation. Interested readers should consult the prior publication in the *Journal of Research in Music Education* for further details on music enrollment and persistence.

Though the percentage of students pursuing music courses in high school lags behind the (combined) percentages of students pursuing at least one course in visual arts, theater, or dance, the pattern of persistence in music is stronger, with less of a gap between single and multiple coursetakers. As of the class of 2009, just over 50% of students who had pursued *any* music courses persisted for at least two years, 36.37% of music students persisted for at least three years, and 27.39% of music students persisted for four years. Similarly to the other arts areas, persistence in music is generally on an upward trend, though there was a clear peak of enrollment in the 1994 cohort and a peak of persistence in the 1998 cohort.

Arts Enrollment by Race/Ethnicity

Prior research (e.g., Elpus, 2014; Elpus & Abril, 2011) has shown that there are significant disparities in the demographics of high school music students as compared to the composition of the total

population of high school students. To understand whether these disparities that have been previously documented in music extend also to students in the other arts disciplines (visual art, theater, and dance), each cohort's population of non-music arts students was analyzed and compared to each cohort's total population using Rao-Scott adjusted χ^2 , the appropriate categorical comparison statistic for data arising from complex sampling.

The racial/ethnic composition of students who had taken a visual art, theater, or dance class in each cohort is presented by percentage as a "slopegraph" (Tufte, 2006) in [Figure 4](#), while [Figure 5](#) is a slopegraph showing the percentage of racial/ethnic groups for the total student population in each cohort⁴. Comparing the non-music arts students to the total population shows that, for all years except for 1982 and 2000, Rao-Scott adjusted χ^2 analyses show that the racial/ethnic composition of arts students was significantly different than the racial/ethnic composition of the total student population. This suggests that student race/ethnicity and arts education enrollment status are related. [Table 1](#) displays the specifics of the Rao-Scott χ^2 analyses for each cohort.

Effects of Arts Education on Later Arts Engagement

Prior research using prior waves of Survey of Public Participation in the Arts (SPPA) data has suggested that exposure to arts education is predictive of future engagement with the arts, either as producer/creator, patron/audience member, or donor. To understand whether the previously documented relationship between arts education and future arts engagement still holds, I conducted a series of logistic regression analyses to determine the effect of childhood arts education on later adult participation in the arts.

As we transition into using the SPPA data for this next portion of the study, it is important to remember that arts education is measured fundamentally differently in the SPPA than it is in the transcript data used in the analyses appearing earlier, and the estimates of the participation in arts education therefore fundamentally differ; specifically, the SPPA estimates fewer adults participated in arts

education than would be assumed based on the enrollment statistics reported earlier. Whereas the National Center for Education Statistics transcript data are “administrative data”—that is, data which are drawn directly from school databases with no involvement from the students themselves—SPPA data are “self-report” data, where participants are directly asked to provide an account of their own past experiences with arts education. While there has been no empirical study within the arts education domain to determine whether respondents systematically under- or over-report their own involvement in arts education when directly asked about their past or present arts education experiences, many social scientists, rightly or wrongly, view self-report data as potentially biased and subject to validity threats (Chan, 2009). Given that the SPPA is designed to be representative of the entire non-institutionalized U.S. adult (aged 18 and over) population, some respondents were surveyed many years past the end of their schooling; it is reasonable to think that, at the least, some recall error may be present in the SPPA data of arts education participation. Additionally, the difference in the population represented by the SPPA (again, all U.S. non-institutionalized adults) and the HSTS studies (all currently-enrolled high school students, as of the cohort year) may account for a large portion of the differences in estimates.

Descriptive Summary Statistics for SPPA Data

Predictor variables employed in the SPPA analyses presented below included indicators for school-based arts education, both aggregated and disaggregated into the separate areas of visual art (creation), photography/cinema (creation), music (performance), theater, dance, visual art appreciation, and music appreciation. Covariates employed included indicators for whether the respondent’s household income was \$50,000 per year or higher, the respondent’s race/ethnicity, the respondent’s sex, the respondent’s highest achieving parent’s level of education, and the respondent’s own level of education. Outcome variables for arts attendance included whether the respondent indicated that he or she had attended live classical music/opera, jazz, theater (musical or otherwise), ballet, or live dance other than ballet. Outcome variables for arts creation included whether the respondent sung, played an instrument, danced, performed in theater (musical or otherwise), took photographs as an artistic outlet, or created non-

photographic visual art. The final outcome variable was the response to a question asking if the respondent had recently donated money to an arts cultural organization.

Summary statistics (means) for the SPPA variables used in the following analyses are presented in [Table 2](#). For the purposes of the following analyses, all variables drawn from the SPPA were dichotomized to binaries, coded one if the respondent had the characteristic underlying the variable and coded zero if the respondent lacked the characteristic. Thus, the unweighted means reported in Table 2 indicate the proportion of respondents who were coded as having the characteristic underlying each variable. So, for example, 38% of SPPA respondents indicated having had some school-based arts education, 47% of SPPA respondents were male, and 52% had household incomes of \$50,000 or higher, and so forth. Sample sizes given in Table 2 report the number of respondents with valid data for each variable. These sample sizes are not uniform among the variables because of the modular design of the SPPA: Not all respondents were asked every question. Where similar questions were asked on different modules (or similar questions asked between the two version of the Core questionnaire), these have been combined to increase the usable sample sizes in the analyses.

Importantly, as the percentages presented in Table 2 are unweighted, they tell us only about the samples of SPPA respondents and are not estimates of the total U.S. non-institutionalized population. However, using the sampling weights, it is possible to generate estimates that are nationally representative. Weighted estimates from the 2012 Survey of Public Participation in the Arts (SPPA) indicate that 36.95% of adults in the United States reported having participated in some school-based arts education. By arts discipline, estimates from the SPPA suggest that 29.63% of adults were in school music performance or appreciation, 17.25% of adults were in school visual art creation or appreciation, 4.39% of adults were in school photography or film, 5.5% of adults were in school theater, and 6.5% of adults were in school dance. Remember that these estimates tend to be lower than than the transcript-indicated enrollment estimates reported earlier; see the discussion above for possible reasons for the disparities.

Adult attendance at “benchmark” arts events

Across the sample of SPPA respondents (unweighted), 13% attended live classical music or opera, 11% attended live jazz, 20% attended live musical or non-musical theater, 3% attended live ballet, and 6% attended live dance other than ballet. [Table 3](#) presents the results of a series of logistic regressions for the effect of any prior, school-based arts education experiences on later adult attendance at these arts events, controlling for a series of covariates related to demographics (sex and race), socioeconomic status (household income, respondent’s educational attainment, and the respondent’s highest achieving parent’s educational attainment), and the region of the country in which the respondent resides. Prior research has shown socioeconomic status and demographics to be related to arts enrollment and benchmark arts attendance; region of the country is included to adjust for the potential of uneven distribution of access to live arts.

As seen in [Table 3](#), controlling for other factors related to arts attendance, adults who had school-based arts education were considerably more likely than adults without school-based arts education to attend live classical music or opera (78% more likely), live musical or non-musical theater (81% more likely), live ballet (78% more likely), and 240% more likely to attend live dance events other than ballet. All of these differences were statistically significant. Though adults who had school-based arts education were estimated to be more likely than those without school-based arts education to attend live jazz, the difference was not statistically significant.

The previous results aggregate all forms of arts education together; the results presented in [Table 4](#) disaggregate the various arts disciplines to determine whether the effects of arts education on later attendance systematically vary by the studied discipline. Interestingly, the disaggregated analysis also “controls” for multiple arts participation; that is, the effect of, say, music is estimated net of the effect of other arts disciplines reported by the respondent. The pattern that emerges in disaggregation is quite interesting—school music performance classes do not significantly predict adult attendance at classical music or opera, yet school music *appreciation* classes do—and by quite a large margin. Adults who had taken music appreciation were 90% more likely than those who had not to attend live classical music or

opera. Adults who had taken school-based dance courses were 72% more likely than others to attend live jazz, but no other arts disciplines were predictive of live jazz attendance. Adult attendance at live theater was predicted by previous school-based coursework in dance (92% more likely) and visual art appreciation (209% more likely). Adults who had taken school-based music performance classes were 79% more likely to have attended ballet than those who had not taken school music, and those who had taken visual art creation courses in school were more 89% more likely as adults to report attending non-ballet live dance.

Though looking at odds ratios can be useful, another way to interpret the results of logistic regression is to look directly at the probabilities predicted by the logistic regression models, which are presented in [Table 5](#). Probabilities in Table 5 arising from variables with statistically significant results in Tables 3 and 4 are statistically significantly different from the population average probability. Across all adults in the United States, regardless of arts education status, the probability of attending live classical music or opera was 0.15. Among those without school-based arts education, the probability was 0.11 and among those with school-based arts education, the probability was 0.18. For theater attendance, the population probability was 0.25; among those with arts education, the probability of attending live theater was 0.29, while the probability for those adults lacking school-based arts education was 0.19. For ballet attendance, the probability of attendance was small for all groups: across the entire population, the probability was 0.03; for those adults with school-based arts education experience, the probability was 0.04 and for those without school-based arts education experience, the probability was 0.02. For attendance at non-ballet dance events, the overall probability of attending was 0.07; among those with arts education it was 0.10 and for those without arts education, it was 0.04.

Prior research using SPPA data has suggested that respondent's level of education is one of the most consistent predictors of benchmark arts attendance. This analysis shows that, for all events except for attending live jazz, arts education experience has a unique predictive ability even when controlling for level of education. However, level of education is still a strong predictor of live arts attendance, even when "controlling" for prior arts education experience. [Table 5](#) also shows the predicted probabilities of

attending each type of arts event by the respondent's level of education, controlling for arts education status as well as all of the covariates in the logistic regression model such as race/ethnicity and household income. As would be expected from the prior research, the probability that a respondent would attend a benchmark arts event increases dramatically with higher educational attainment, even when controlling for the respondent's school-based arts education experiences. There are extremely large disparities in probabilities between those holding postgraduate degrees and those who had not finished high school for every type of arts event.

Creation or performance of art in various forms

Across the sample of SPPA respondents (unweighted), 13% reported playing a musical instrument, 10% reported that they sing, 5% reported that they performed dance, 2% reported that they had performed in musical or non-musical theater, 13% reported that they took photographs as an artistic endeavor (as opposed to day-to-day "snapshots" simply to document their memories), and 6% reported that they created non-photographic works of visual art. [Table 6](#) presents the results of a series of logistic regressions for the effect of any prior, school-based arts education experiences on later adult arts creation or performance, controlling for the same series of covariates as above: demographics (sex and race), socioeconomic status (household income, respondent's educational attainment, and the respondent's highest achieving parent's educational attainment), and the region of the country in which the respondent resides.

As seen in Table 6, controlling for other factors related to arts participation, adults who had school-based arts education were considerably more likely than adults without school-based arts education to play an instrument (4.58 times more likely), sing (3.64 times more likely), take photographs as an artistic endeavor (2.34 times more likely), and create other visual art (2.69 times more likely). While the estimates for the effect of prior arts education on performing dance or theater are not statistically significant, the estimate odds ratios are greater than one, which suggests that the direction of the effect is positive. It is possible that the rarity of these kinds of arts participation in the population is one important

reason the estimates do not achieve statistical significance as this lessens the precision of the regression point estimates.

Interesting results in the demographic and socioeconomic covariates are evident in Table 6. Males are significantly more likely than females to report playing an instrument (2.17 times). This result is somewhat curious in terms of the potential reasons for the association, especially given past research suggesting that slightly more females than males pursue instrumental music education (Elpus, 2015) and future research into the gendered nature of adult instrumental musical performance is warranted. African American adults were significantly less likely (76% *less* likely) than White respondents, the reference category for this regression, to report that they played an instrument—future research into the possible mechanisms underlying this disparity might help establish a greater representation of African American adults among the population of those playing musical instruments. Hawaiian/Pacific Islander respondents were considerably more likely to report that they played a musical instrument than were White respondents. This is possibly due to the cultural integration of musical instruments in Hawaiian and certain other island cultures, though future research is needed to confirm this speculation. Though male and African American respondents have statistically significant estimates for the odds ratios on performing in theater, caution is urged in interpreting these results. The estimates for theatrical performance may be spurious due to the rarity of theatrical performers among the SPPA sample members; more research here is warranted to help establish the veracity of these estimates.

Perhaps most interestingly, once arts education status and the other covariates and arts education status are c, this analysis finds no relationship between household income (dichotomized to above or below \$50,000 per year) or the respondent's level of education and artistic creation or performance. This means that although both of these predictors are related to *attendance* at arts events, the less well educated and lower income earning adults in the U.S. are no less likely than their more well educated and higher income counterparts to engage in art *making*.

The results for disaggregated arts areas are presented in [Table 7](#). Most of these results are unsurprising, but should be heartening to the nation's arts educators. There are clear, high magnitude

relationships between school-based arts education in various disciplines and later adult engagement as a performer or creator of the studied art. Specifically, music education had a strong relationship with adult instrument playing (school musicians were 2.45 times more likely to play an instrument as adults) and singing (school musicians were 2.39 times more likely to sing as adults). Music appreciation courses were also strongly related to adult instrumental music making, with those who had taken music appreciation 4.07 times more likely to play an instrument as an adult. School-based visual arts courses were even more strongly associated with adult visual art-making—adults who had taken visual art creation courses in school were 4.44 times more likely to report that they created non-photographic visual art than were adults who had not had visual art education in school. School-based theater courses were also strongly associated with later theatrical performance: adults who had pursued coursework in theater were over 10 times more likely than those who hadn't to report adult involvement as a theatrical performer; theater course-takers were also 2 times more likely to report singing as adults and 3.23 times more likely than others to report creating non-photographic visual art.

Predicted probabilities from the logistic regression models for arts creation are presented in [Table 8](#), which can help concretize the odds ratio results reported above. Arts students (in aggregate) had a .31 probability of playing an instrument as an adult, compared to a .20 chance for the total population averaged and just a .10 chance for adults with no school-based music experience. Similarly, adults who had taken visual arts courses in school had a probability of .18 that they would report making non-photographic visual art as adults, compared to a .09 probability for the total population and only a .05 probability for non-visual art students. Clearly, arts education is an investment in lifelong participation with the arts—adults who have experience with school-based arts education are considerably, and often statistically significantly, more likely than those with no arts education to pursue art creation and performance as adults.

Donation of money, goods, or services to arts or cultural organizations

Across the entire samples of SPPA respondents (unweighted), 11% reported they had recently donated to an arts or cultural nonprofit organization. [Table 9](#) presents the results of a logistic regression for the effects of any school-based arts education on later donation to arts and cultural organizations. [Table 10](#) shows the predicted probabilities derived from the logistic regression models presented in the previous two tables.

Experience with school-based arts education is a strong predictor of becoming an arts or cultural organization donor. As seen in Table 9, adults who had pursued school-based arts education are 8.17 times more likely than those who had not to report that they donated to arts or cultural organizations. The effect of prior arts education is stronger than the effect for household income, which fails to achieve statistical significance in the model. Predicted probabilities reported in Table 10 suggest that only 1 in 25 adults who had no school-based arts education donated to arts or cultural organizations (probability of .04) but that nearly 1 in 5 adults who had school-based arts education became arts and cultural organization donors (probability of .19).

CONCLUSIONS

The present study provides evidence that the state of school-based arts education in American schools is somewhat stronger than many people might estimate and that arts education does have measurable, positive arts related outcomes. Results from the analyses on uptake rates suggest that an increasing proportion of students in the United States graduate high school with at least one course in the arts (80.49% as of the class of 2009, up from 68.2% in 1982), and persistence in the arts over multiple years is also on an upward trend. Results from analyses of the effect of arts education on later engagement in the arts suggest that arts education is strongly associated with later arts participation as patron/consumer, donor/financial supporter, and performer/creator, even after controlling for respondent's household income, educational attainment, parental educational attainment, sex, and race. If one aim of arts education is to engender a lifelong connection with the arts, the results of this study suggest that arts education is achieving this aim for many of its alumni.

Implications for education policy. Arts advocates have, in the past three decades, worked assiduously to ensure that arts education remains a vital part of American schooling. The results of this study suggest that—insofar as getting at least *some* arts education delivered to as many American students as possible is concerned, that these efforts have been successful. And yet, the picture is somewhat nuanced—though a vast majority of students (80.49%) have at least some one year of arts education coursework appearing on their high school transcripts by graduation, the rates of students pursuing additional courses beyond what might be mandated are considerably lower. Compared to 66% of students pursuing at least one yearlong course in visual art, dance, or theater, only 24% of students pursue at least two years of these courses; compared to 34% of students enrolling in at least one yearlong course in music, only 17% of students pursue at least two years of music. While these persistence numbers have also increased over time, there is clearly more work to be done to boost the status of arts education as a viable elective choice beyond a one year mandate. One such policy lever that might improve arts persistence rates is the offering of advanced level courses in the arts that are *given the same grade point average weight* typically afforded to so-called “honors” and Advanced Placement level classes, as one reason that

students may not elect to pursue arts coursework beyond required minimums is the perception that doing so may harm class rank and, by extension, college prospects. Another such policy lever would be to recognize that rigorous courses in dance ought to be “double counted” as meeting both arts and physical education requirements, which might provide the scheduling leeway needed by students to elect more dance courses and increase the status and uptake of that art relative to the others in the American high school. Finally, in jurisdictions that have established minimum graduation requirements for arts coursework, efforts to ensure these mandates are strengthened—or at the very least maintained if they are threatened—will yield worthwhile outcomes.

Implications for arts and cultural policy. Bill Ivey has argued that “arts education in the United States exhibits fundamental flaws that shortstop engagement in art broad enough to make art part of the life of every citizen” (Ivey, 2010, p. 109). Evidence from the present study, however, tends to undercut Ivey’s assertion. Rather than disengage from art upon graduation, students of school-based arts education were significantly more likely to create art in their own lives, more likely to patronize arts events, and more likely to financially support arts and cultural organizations. Thus, any cultural policy that seeks to increase lifelong engagement with the arts must seriously contend with the improvement of arts education in the locality to be served. Cultural policy that emphasizes audience development, and by extension, the arts as drivers for economic development should be examined for connections to and intersections with enhancements to school-based arts education, which may currently serve (in one capacity) as the largest audience development enterprise in the nation.

Implications for arts educators. Rationales for arts education in the schools often try to echo the utilitarian value of the arts to whatever other aims are the then-present focus of the educational system (Elpus, 2007). Yet, when pressed, most arts educators would readily admit that, philosophically, they entered the profession primarily to share and develop the art that had become so central to their own lives with their students (Eisner, 2002; Reimer, 2003). Results of the present study suggest that these efforts have not been in vain—school-based arts education *does* lead to future engagement with the arts and *does* have measurable arts outcomes. While educators should be heartened to learn that arts education uptake is

potentially far greater than they might imagine, they should take the increase of persistence rates as a personal charge. While one year of arts education is frequently mandated, future years of arts education are clearly elective, and in many cases the result of the experiences provided to students by the arts educators with whom they work. Arts educators often serve as important, influential non-parental adults in the lives of the students they teach (Beam, Chen, & Greenberger, 2002; Ivaldi & O'Neill, 2008) and deepening the connection of students to the making and consumption of arts beyond one year of a mandatory course and throughout their lives is often the result of teacher driven inspiration. Arts educators should not take this charge lightly, and recognize that their daily work, if done well, can help their students develop into an arts-engaged citizen.

Clearly, arts advocates, working artists, arts administrators, and arts educators should come to recognize the central importance of school-based arts education in creating an arts-engaged populous. Nearly two decades ago, Charles Fowler (1996) argued that “[t]he arts, like other subjects in the curriculum of American schools, are affiliated with the schools’ important responsibility to pass on the civilization—in this case, our rich and rewarding cultural heritage—to the next generation” (p. 3). Results from the present study should suggest to stakeholders that improvements in the status, availability, and uptake of arts education in the nation’s schools will likely lead to greater democratized art making, greater support for artists and arts organizations, and and greater engagement in the arts by adults. The increasing uptake rates of high school arts courses over the three decade period between 1982 and 2009 are heartening, but with an understanding of just how much school-based arts education is an investment in the future artistic engagement of America’s youth, the important place of the arts in American education should be celebrated, protected, and advanced.

APPENDIX: RESEARCH METHODOLOGY DETAILS

Research Question 1 using High School Transcript Study data. These questions were answered by identifying the sample members in ten of the National Center for Education Statistics (NCES) High School Transcript Studies (HSTS) who earned at least one credit for formal arts study in the areas of Studio Art, Photography, Dance, Theater, Film, and Multi-Arts Survey courses. The procedure follows the same one developed by Elpus (2013; 2014; 2011) in earlier arts and music education studies that employed NCES transcript data. Transcripts in the data are coded using the U.S. Department of Education's "Classification for Secondary School Courses" (CSSC) system. I used the CSSC codes to "flag" students who had pursued music courses in high school; these flags were then used to estimate the percentage or proportion of students who enrolled in each type of arts courses nationwide.

Once arts students were identified in each dataset, estimates of the proportion of the population of U.S. high school students within each cohort who had earned credit for at least one year of studio art, photography, dance, theater, or film courses were computed using the survey sampling weights provided in the data. These weights ensure that the estimates are representative of the populations of high school students who were slated to graduate in the years 1982, 1987, 1990, 1992, 1994, 1998, 2000, 2004, 2005, and 2009. Estimates for music are drawn from previously published research (Elpus, 2014) and the relevant findings from that study have been cited, with attribution, here. The comparison of the racial/ethnic makeup of arts students and the full student population was conducted using the Rao-Scott adjusted χ^2 (Rao & Scott, 1984), a bivariate test of association for categorical variables that is suitable for data arising from complex survey samples.

Research Question 3 using 2012 SPPA data. The present study was designed as a quasi-experimental study, using observable covariates to adjust for selection bias (Murnane & Willett, 2011). I identified 2012 SPPA sample members with arts education experience will based on their self-reported responses to the SPPA Module E questions about arts education experiences. Since selection into arts

study cannot be manipulated in observational studies such as this one, I accounted for preexisting differences between former arts and non-arts students using covariates related to selection into art study, chosen strategically based on prior research (DiMaggio & Mukhtar, 2004; Elpus & Abril, 2011; Fitzpatrick, 2006; Kinney, 2008) and their availability in the SPPA dataset.

Estimates of the effect of arts education on later arts participation were generated using direct entry of covariates into regression models, using both aggregated (i.e., “arts student,” and “non-arts student”) and disaggregated (i.e., “music student,” “visual art student,”) indicators of arts education experiences.

Results were generated through estimation of the following theoretical models:

$$Outcome_i = \alpha + \beta ArtsStudy_i + \gamma Covariates_{ij} + \varepsilon \quad (1)$$

$$Outcome_i = \alpha + \beta_1 MusicStudy_i + \beta_2 VisualArtStudy_i + \beta_3 DanceStudy_i + \beta_4 TheaterStudy + \beta_5 FilmStudy + \gamma Covariates_{ij} + \varepsilon \quad (2)$$

In Equation (1), *Outcome_i* represents the arts participation outcome of interest from Research Question (1a) for the *i*th respondent, *ArtsStudy_i* is a dichotomous variable representing the arts education status of the *i*th respondent (0 = no arts study, 1 = arts study), and Covariates are the vector of covariates described above. Here, the parameter of interest is β , which represents the effect of arts education on the later arts participation outcome.

In Equation (2), the single dichotomous variable *ArtsStudy_i* from Equation (1) has been disaggregated into the various types of arts education experiences included in the Module E SPPA questionnaire. The disaggregated variables are still dichotomously coded; they are set to 1 if the *i*th respondent reported participating in that form of arts education and set to 0 otherwise. Each β represents the unique contribution of each particular form of arts education.

Since the SPPA uses the complex sampling strategy devised by the U.S. Census Bureau for its Current Population Survey (to which the 2012 SPPA was a supplement), all estimates were computed using the appropriate weights for the SPPA modules involved in the analyses—in this case, the

PWNWGT and its attendant replicates in the SPPA data. Weighting the sample ensured that estimates are representative of the population of non-institutionalized adults in the U.S., the target population for the SPPA and the CPS. Additionally, standard errors were computed using the appropriate set of replicate weights for each analysis. All analyses will be computed in the Stata statistics package, version 13.1, which can correctly compute standard errors arising from complex survey data.

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TABLES

Table 1

Rao-Scott χ^2 results for racial/ethnic composition of non-music arts students in each cohort

Cohort Graduation Year	<i>F</i>	<i>df</i>	<i>p</i>
1982	1.61	(4, 3830)	.170
1987	5.57	(2, 80)	.004
1990	5.40	(3, 170)	.001
1992	4.18	(4, 3470)	.003
1994	6.09	(5, 280)	.000
1998	4.04	(2, 80)	.026
2000	2.16	(3, 180)	.093
2004	10.02	(4, 770)	.000
2005	4.70	(4, 250)	.001
2009	5.14	(4, 240)	.000

Table 2*Descriptive summary statistics for 2012 Survey of Public Participation in the Arts variables*

Variable	(1) N	(2) Mean
Predictor Variables		
School-based music education	9,411	0.28
School-based photography/film	9,406	0.05
School-based visual art	9,393	0.13
School-based theater	9,395	0.06
School-based dance	9,385	0.07
School-based art appreciation	9,330	0.09
School-based music appreciation	9,320	0.09
Any school-based arts education	9,444	0.38
Covariates		
White	35,735	0.84
Black or African American	35,735	0.09
Native American / Alaska Native	35,735	0.01
Asian American	35,735	0.04
Hawaiian/Pacific Islander	35,735	0.00
Multiracial	35,735	0.01
Other Race	35,735	0.00
Hispanic/Latino origin (may be any race)	35,735	0.11
Female	35,735	0.53
Male	35,735	0.47
Parent did not graduate high school	3,316	0.07
Parent holds only H.S. diploma	3,316	0.26
Parent attended some college	3,316	0.23
Parent holds bachelor's degree	3,316	0.27
Parent holds postgraduate degree	3,316	0.18
Respondent did not graduate high school	35,735	0.11
Respondent holds only H.S. diploma	35,735	0.30
Respondent attended some college	35,735	0.19
Respondent hold's associate's degree	35,735	0.10
Respondent holds bachelor's degree	35,735	0.20
Respondent holds postgraduate degree	35,735	0.11
Household income \$50,000 or more	35,735	0.52
Outcomes		
Attended live classical music/opera	23,634	0.13
Attended live jazz	23,693	0.11
Attended live theater	35,425	0.20
Attended live ballet	35,361	0.03
Attended live dance (other than ballet)	35,334	0.06
Donated money to arts organization	4,917	0.11
Plays an instrument (as an adult)	13,776	0.13
Sings (as an adult)	13,755	0.10
Dances (as an adult)	13,769	0.05
Performs in live theater (as an adult)	13,787	0.02
Creates Photography (as an adult)	9,510	0.13
Creates Other Visual Art (as an adult)	9,503	0.06

Table 3*Logistic Regression results for effect of any arts education (aggregated) on attendance at various live arts events*

	(1) Classical Music/Opera	(2) Jazz	(3) Theater	(4) Ballet	(5) Other dance
Arts education	1.78*** (0.29)	1.39 (0.24)	1.81*** (0.22)	1.78* (0.44)	2.40*** (0.49)
Male (vs. Female reference category)	0.77 (0.12)	1.10 (0.16)	0.68*** (0.08)	0.57* (0.13)	0.59** (0.10)
Race (vs. White reference category)					
African American	0.36* (0.16)	1.75* (0.47)	0.97 (0.25)	0.29* (0.17)	0.85 (0.27)
Native American/Alaska Native	0.08* (0.08)	0.24 (0.21)	0.46 (0.33)	0.47 (0.50)	3.64* (1.98)
Asian	1.08 (0.46)	0.66 (0.28)	0.58* (0.13)	1.07 (0.57)	1.08 (0.40)
Hawaiian/Pacific Islander	2.30 (2.58)	0.20 (0.22)	1.05 (0.74)	1.01 (1.08)	2.73 (2.35)
Multiracial	4.03** (2.07)	1.20 (0.71)	0.58 (0.28)	1.44 (1.24)	1.14 (0.70)
Hispanic ethnicity	1.02 (0.35)	1.39 (0.47)	1.07 (0.31)	1.57 (0.68)	1.01 (0.40)
Household income \$50,000+	0.92 (0.14)	1.29 (0.23)	1.46*** (0.16)	1.07 (0.30)	0.98 (0.16)
Educational attainment (vs. no H.S. diploma)					
Respondent holds H.S. diploma only	1.25 (0.85)	1.84 (1.42)	2.12 (0.81)	1.20 (1.09)	2.96 (1.62)
Respondent attended some college	1.77 (1.33)	2.59 (2.01)	3.65*** (1.37)	1.22 (1.08)	3.80* (2.23)
Respondent holds associate's degree	1.81 (1.44)	3.85 (3.03)	3.69** (1.41)	0.78 (0.76)	4.20* (2.54)
Respondent hold's bachelor's degree	4.24* (3.04)	2.82 (2.15)	5.93*** (2.20)	3.25 (2.87)	6.30** (3.60)
Respondent holds postgraduate degree	6.26* (4.71)	5.00* (3.89)	7.89*** (3.20)	5.09 (4.43)	6.95** (4.16)
Respondent's Parent holds H.S. diploma only	1.09 (0.46)	0.64 (0.24)	0.81 (0.20)	0.79 (0.44)	0.84 (0.40)
Respondent's Parent attended some college	1.45 (0.58)	0.84 (0.30)	0.82 (0.19)	0.80 (0.42)	0.91 (0.45)
Respondent's Parent holds bachelor's degree	1.10 (0.47)	0.98 (0.35)	0.91 (0.25)	0.83 (0.53)	1.02 (0.49)
Respondent's Parent holds postgrad degree	1.56 (0.75)	0.78 (0.29)	1.39 (0.35)	1.01 (0.65)	1.22 (0.62)
Region of Country (vs. East)					
Resides in Midwest	1.08 (0.24)	1.19 (0.27)	0.88 (0.13)	0.64 (0.22)	1.13 (0.30)
Resides in South	0.96 (0.20)	0.93 (0.23)	0.69* (0.11)	0.82 (0.26)	1.23 (0.30)
Resides in West	1.38 (0.31)	0.90 (0.24)	0.96 (0.17)	0.56 (0.20)	0.97 (0.30)
Constant	0.04*** (0.03)	0.04*** (0.03)	0.07*** (0.03)	0.02*** (0.02)	0.01*** (0.01)

Note. Coefficients are reported as odds ratios. Standard errors in parentheses. Reported estimates and standard errors employ the appropriate SPPA survey weights and are adjusted for the stratified sampling. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 4*Logistic Regression results for effect of any arts education (disaggregated) on attendance at various live arts events*

	(1) Classical Music/Opera	(2) Jazz	(3) Theater	(4) Ballet	(5) Other dance
Arts education					
School music (performance)	1.04 (0.15)	0.99 (0.18)	1.17 (0.18)	1.79* (0.46)	1.32 (0.24)
School visual art (creation)	0.87 (0.17)	1.09 (0.23)	0.86 (0.14)	1.36 (0.47)	1.89** (0.40)
School photography/cinema	1.00 (0.27)	1.57 (0.36)	1.00 (0.21)	0.90 (0.39)	1.22 (0.34)
School theater	1.60* (0.33)	0.88 (0.21)	1.37 (0.26)	1.07 (0.41)	1.29 (0.29)
School dance	1.29 (0.28)	1.72* (0.37)	1.92*** (0.32)	0.97 (0.30)	1.26 (0.27)
School visual art appreciation	1.18 (0.24)	0.77 (0.20)	2.09*** (0.35)	1.36 (0.41)	1.18 (0.33)
School music appreciation	1.90** (0.39)	1.48 (0.30)	1.02 (0.16)	0.94 (0.20)	0.89 (0.20)
Male (vs. Female reference category)	0.79 (0.12)	1.18 (0.18)	0.72** (0.08)	0.57* (0.13)	0.60** (0.10)
Race (vs. White reference category)					
African American	0.33* (0.15)	1.70 (0.48)	0.87 (0.20)	0.28* (0.16)	0.79 (0.26)
Native American/Alaska Native	0.09* (0.09)	0.26 (0.22)	0.54 (0.39)	0.48 (0.52)	4.07* (2.22)
Asian	1.03 (0.43)	0.67 (0.28)	0.58* (0.13)	1.08 (0.57)	1.03 (0.36)
Hawaiian/Pacific Islander	2.15 (2.70)	0.16 (0.18)	1.16 (0.88)	1.16 (1.20)	2.78 (2.50)
Multiracial	3.58** (1.72)	1.14 (0.69)	0.57 (0.29)	1.37 (1.22)	1.14 (0.73)
Hispanic ethnicity	1.03 (0.35)	1.37 (0.45)	1.02 (0.27)	1.61 (0.70)	0.96 (0.38)
Household income \$50,000+	0.93 (0.15)	1.32 (0.23)	1.47*** (0.16)	1.07 (0.31)	1.03 (0.18)
Educational attainment (vs. no H.S. diploma)					
Respondent holds H.S. diploma only	1.24 (0.86)	1.82 (1.43)	1.97 (0.74)	1.12 (1.02)	2.87 (1.55)
Respondent attended some college	1.77 (1.34)	2.59 (2.04)	3.26** (1.22)	1.12 (0.99)	3.61* (2.10)
Respondent holds associate's degree	1.84 (1.47)	3.72 (2.96)	3.36** (1.28)	0.74 (0.73)	4.08* (2.46)
Respondent hold's bachelor's degree	4.02 (2.93)	2.70 (2.08)	5.26*** (1.95)	3.06 (2.68)	6.16** (3.49)
Respondent holds postgraduate degree	5.88* (4.48)	4.85 (3.85)	6.91*** (2.80)	4.72 (4.12)	6.74** (3.96)
Respondent's Parent holds H.S. diploma only	1.13 (0.49)	0.63 (0.24)	0.82 (0.20)	0.79 (0.46)	0.83 (0.40)
Respondent's Parent attended some college	1.43 (0.59)	0.85 (0.31)	0.84 (0.20)	0.77 (0.42)	0.92 (0.45)
Respondent's Parent holds bachelor's degree	1.12 (0.49)	0.99 (0.37)	0.91 (0.25)	0.80 (0.53)	1.01 (0.48)
Respondent's Parent holds postgrad degree	1.60 (0.77)	0.78 (0.30)	1.41 (0.36)	0.94 (0.62)	1.18 (0.60)
Region of Country (vs. East)					
Resides in Midwest	1.12 (0.24)	1.17 (0.27)	0.92 (0.14)	0.63 (0.22)	1.13 (0.30)
Resides in South	0.91 (0.19)	0.90 (0.23)	0.68* (0.11)	0.82 (0.27)	1.21 (0.30)
Resides in West	1.38 (0.32)	0.86 (0.22)	0.92 (0.16)	0.53 (0.20)	0.92 (0.29)
Constant	0.05*** (0.04)	0.04*** (0.03)	0.08*** (0.03)	0.02*** (0.02)	0.01*** (0.01)

Note. Coefficients are reported as odds ratios. Standard errors in parentheses. Reported estimates and standard errors employ the appropriate SPPA survey weights and are adjusted for the stratified sampling. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 5*Predicted probabilities of attending benchmark arts events by educational attainment and arts education status*

	(1) Classical Music/Opera	(2) Jazz	(3) Theater	(4) Ballet	(5) Other dance
Population Average	.15	.11	.25	.03	.07
Respondent's Educational Attainment					
Less than H.S. diploma	.06	.04	.08	.02	.02
H.S. diploma only	.08	.08	.15	.02	.05
Attended some college	.11	.11	.22	.02	.06
Holds associate's degree	.11	.15	.23	.01	.07
Holds bachelor's degree	.21	.11	.31	.05	.10
Holds postgraduate degree	.28	.18	.37	.07	.10
School Arts Education (combined)					
Yes	.18	.13	.29	.04	.10
No	.11	.10	.19	.02	.04
Arts education by discipline					
School music (performance)	.15	.11	.26	.04	.08
School visual art (creation)	.14	.16	.23	.04	.11
School photography/cinema	.15	.12	.25	.03	.08
School theater	.20	.10	.29	.04	.09
School dance	.17	.17	.35	.03	.09
School visual art appreciation	.16	.10	.36	.04	.08
School music appreciation	.22	.15	.25	.03	.07

Note. Predicted probabilities, other than the population average, in this table derive from the logistic regression models reported in Tables 3 and 4 above, and hold all other covariates constant.

Table 6*Logistic regression results for effects of arts education (aggregated) on active arts participation/creation*

	(1)	(2)	(3)	(4)	(5)	(6)
	Play an instrument	Sing	Dance	Perform in Theater	Take Artistic Photographs	Create other Visual Art
Arts education	4.58*** (1.27)	3.64*** (1.31)	1.90 (0.97)	10.17 (11.85)	2.34** (0.61)	2.69** (0.99)
Male (vs. Female reference category)	2.17*** (0.48)	0.81 (0.28)	0.40 (0.26)	4.32* (2.84)	0.81 (0.19)	0.49** (0.13)
Race (vs. White reference category)						
African American	0.33* (0.18)	1.79 (0.73)	1.21 (0.87)	6.38* (5.14)	0.79 (0.41)	0.33 (0.25)
Native American/Alaska Native	-†	2.49 (2.80)	0.95 (1.21)	-†	3.52 (3.20)	10.30 (12.16)
Asian	1.11 (0.60)	1.16 (1.07)	0.76 (0.76)	4.17 (5.91)	1.08 (0.63)	-†
Hawaiian/Pacific Islander	24.75* (35.19)	-†	-†	-†	-†	23.29* (29.18)
Multiracial	1.11 (1.02)	0.33 (0.41)	0.49 (0.67)	-†	1.70 (1.43)	3.35 (2.84)
Hispanic ethnicity	0.92 (0.38)	0.48 (0.41)	-†	1.37 (1.68)	0.80 (0.38)	0.97 (0.43)
Household income \$50,000+	0.91 (0.22)	0.54 (0.17)	0.75 (0.37)	0.90 (0.83)	1.03 (0.22)	0.92 (0.34)
Educational attainment (vs. no H.S. diploma)						
Respondent holds H.S. diploma only	1.15 (0.86)	1.55 (1.33)	1.14 (1.51)	1.17 (0.95)	0.41 (0.25)	0.77 (0.69)
Respondent attended some college	1.56 (1.13)	0.92 (0.81)	4.74 (6.24)	0.50 (0.45)	1.38 (0.71)	0.67 (0.57)
Respondent holds associate's degree	1.87 (1.55)	0.83 (0.75)	3.29 (4.50)	3.27 (4.17)	1.15 (0.73)	0.62 (0.55)
Respondent hold's bachelor's degree	1.10 (0.86)	1.44 (1.27)	5.30 (6.81)	-†	1.91 (1.01)	1.02 (0.85)
Respondent holds postgraduate degree	1.07 (0.82)	1.01 (0.94)	1.91 (2.62)	-†	2.46 (1.51)	1.46 (1.16)
Respondent's Parent holds H.S. diploma only	2.13 (1.60)	1.22 (0.66)	0.23 (0.20)	2.59 (4.05)	0.40 (0.22)	0.34 (0.27)
Respondent's Parent attended some college	3.37 (2.42)	1.98 (1.05)	0.63 (0.57)	4.57 (5.77)	0.49 (0.22)	0.57 (0.50)
Respondent's Parent holds bachelor's degree	3.43 (2.56)	0.66 (0.45)	0.45 (0.40)	0.68 (0.89)	0.37* (0.17)	1.48 (0.97)
Respondent's Parent holds postgrad degree	4.18 (3.16)	1.47 (0.90)	0.46 (0.40)	-†	0.56 (0.28)	1.10 (0.75)
Region of Country (vs. East)						
Resides in Midwest	0.78 (0.29)	0.86 (0.45)	0.35 (0.25)	1.88 (2.13)	1.33 (0.43)	1.46 (0.77)
Resides in South	0.59 (0.20)	1.34 (0.66)	1.45 (1.06)	5.30 (5.03)	1.02 (0.35)	1.69 (0.90)
Resides in West	0.80 (0.30)	1.62 (0.77)	1.41 (0.93)	3.78 (4.21)	1.41 (0.44)	1.39 (0.85)
Constant	0.03** (0.03)	0.04** (0.05)	0.04* (0.06)	0.00*** (0.00)	0.20* (0.13)	0.06** (0.07)

Note. Coefficients are reported as odds ratios. Standard errors in parentheses. Reported estimates and standard errors employ the appropriate SPPA survey weights and are adjusted for the stratified sampling. † indicates category was eliminated from this analysis due to collinearity/lack of variation in the outcome.

Table 7*Logistic regression results for effects of arts education (aggregated) on active arts participation/creation*

	(1) Play an instrument	(2) Sing	(3) Perform in Theater	(4) Take Artistic Photographs	(5) Create other Visual Art
Arts education					
School music (performance)	2.45** (0.71)	2.39* (0.91)	4.27 (3.53)	1.78* (0.42)	1.19 (0.46)
School visual art (creation)	1.39 (0.45)	1.14 (0.44)	1.15 (1.55)	1.60 (0.44)	4.44*** (1.50)
School photography/cinema	0.67 (0.39)	0.52 (0.32)	0.66 (1.25)	1.98 (1.02)	1.72 (0.90)
School theater	0.54 (0.25)	2.00* (0.66)	10.11* (10.62)	1.54 (0.55)	3.23** (1.37)
School dance	2.63* (1.10)	1.17 (0.45)	0.77 (1.14)	1.51 (0.61)	1.21 (0.56)
School visual art appreciation	0.80 (0.34)	1.67 (0.59)	4.90 (7.42)	1.75 (0.56)	1.76 (0.79)
School music appreciation	4.07*** (1.49)	1.87 (0.74)	0.49 (0.52)	0.97 (0.36)	0.54 (0.29)
Male (vs. Female reference category)	2.53*** (0.62)	0.84 (0.32)	4.74 (4.20)	0.80 (0.20)	0.40** (0.12)
Race (vs. White reference category)					
African American	0.26 (0.18)	1.65 (0.76)	8.40** (5.62)	0.79 (0.40)	0.35 (0.32)
Native American/Alaska Native	-†	2.14 (2.63)	-†	3.00 (3.11)	8.90 (11.34)
Asian	0.97 (0.52)	1.22 (1.13)	4.82 (6.40)	1.16 (0.67)	-†
Hawaiian/Pacific Islander	16.14 (26.59)	-†	-†	-†	15.83* (17.51)
Multiracial	0.69 (0.75)	0.27 (0.38)		1.62 (1.33)	3.04 (2.99)
Hispanic ethnicity	1.00 (0.43)	0.44 (0.43)	0.76 (0.89)	0.87 (0.40)	1.14 (0.59)
Household income \$50,000+	0.99 (0.25)	0.59 (0.19)	1.23 (1.00)	1.12 (0.24)	1.11 (0.41)
Educational attainment (vs. no H.S. diploma)					
Respondent holds H.S. diploma only	1.09 (0.82)	1.61 (1.54)	1.33 (0.94)	0.39 (0.25)	0.76 (0.64)
Respondent attended some college	1.31 (0.99)	0.81 (0.80)	0.47 (0.41)	1.17 (0.63)	0.51 (0.45)
Respondent holds associate's degree	1.61 (1.34)	0.74 (0.72)	3.74 (5.45)	1.12 (0.70)	0.53 (0.44)
Respondent hold's bachelor's degree	0.96 (0.77)	1.24 (1.15)	-†	1.64 (0.90)	0.95 (0.78)
Respondent holds postgraduate degree	0.92 (0.70)	0.70 (0.68)	-†	2.30 (1.50)	1.69 (1.25)
Respondent's Parent holds H.S. diploma only	2.22 (2.01)	1.64 (1.04)	6.57 (12.65)	0.40 (0.21)	0.30 (0.23)
Respondent's Parent attended some college	3.77 (3.20)	2.44 (1.50)	6.61 (10.96)	0.42 (0.18)	0.39 (0.36)
Respondent's Parent holds bachelor's degree	3.44 (3.09)	0.80 (0.59)	1.36 (2.47)	0.28** (0.14)	1.01 (0.68)
Respondent's Parent holds postgrad degree	4.20 (3.81)	1.91 (1.30)	-†	0.46 (0.23)	0.62 (0.43)
Region of Country (vs. East)					
Resides in Midwest	0.69 (0.25)	0.81 (0.43)	1.14 (1.70)	1.36 (0.43)	1.64 (0.80)
Resides in South	0.50* (0.17)	1.20 (0.56)	3.88 (3.33)	1.06 (0.35)	1.93 (0.92)
Resides in West	0.78 (0.28)	1.57 (0.72)	2.42 (2.31)	1.37 (0.41)	1.57 (0.91)
Constant	0.04** (0.04)	0.04* (0.05)	0.00*** (0.00)	0.22* (0.14)	0.07** (0.06)

Note. Coefficients are reported as odds ratios. Standard errors in parentheses. Reported estimates and standard errors employ the appropriate SPPA survey weights and are adjusted for the stratified sampling. † indicates category was eliminated from this analysis due to collinearity/lack of variation in the outcome.

Table 8*Predicted probabilities for creating/performing art by educational attainment and arts education status*

	(1) Play an instrument	(2) Sing	(3) Perform in Theater	(4) Take Artistic Photographs	(5) Create other Visual Art
Population Average	.20	.10	.02	.18	.09
Respondent's Educational Attainment					
Less than H.S. diploma	.18	.08	-	.14	.09
H.S. diploma only	.20	.12	.02	.06	.08
Attended some college	.22	.08	.01	.18	.07
Holds associate's degree	.25	.07	.04	.16	.06
Holds bachelor's degree	.18	.11	.02	.23	.10
Holds postgraduate degree	.17	.09	-	.28	.13
School Arts Education (combined)					
Yes	.31	.15	.04	.23	.11
No	.10	.05	.00	.12	.05
Arts education by discipline					
School music (performance)	.28	.15	.03	.23	.09
School visual art (creation)	.24	.11	.02	.28	.18
School photography/cinema	.15	.06	.01	.23	.12
School theater	.14	.16	.08	.24	.18
School dance	.33	.11	.01	.23	.10
School visual art appreciation	.18	.14	.04	.25	.12
School music appreciation	.40	.15	.01	.18	.06

Note. Predicted probabilities, other than the population average, in this table derive from the logistic regression models reported in Tables 6 and 7 above, and hold all other covariates constant.

Table 9*Logistic Regression results for the effects of arts education on adults donating to arts/cultural organizations*

	(1)	(2)
	Aggregated Arts Education	Disaggregated Arts Education
Arts education (aggregated)	8.17*** (3.98)	
Arts education (disaggregated)		
School music (performance)		1.61 (0.79)
School visual art (creation)		1.35 (0.69)
School photography/cinema		0.47 (0.28)
School theater		3.40* (1.95)
School dance		3.09 (1.87)
School visual art appreciation		0.87 (0.40)
School music appreciation		3.93** (1.99)
Male (vs. Female reference category)	2.98** (1.21)	4.88** (2.59)
Race (vs. White reference category)		
African American	1.14 (0.75)	1.11 (0.96)
Native American/Alaska Native	4.93 (7.09)	5.03 (9.97)
Asian	0.16 (0.21)	0.19 (0.23)
Hawaiian/Pacific Islander	-†	-†
Multiracial	0.88 (1.32)	0.60 (0.85)
Hispanic ethnicity	0.54 (0.43)	0.51 (0.39)
Household income \$50,000+	0.80 (0.31)	0.81 (0.32)
Educational attainment (vs. no H.S. diploma)		
Respondent holds H.S. diploma only	0.87 (0.79)	1.01 (0.89)
Respondent attended some college	0.43 (0.44)	0.36 (0.39)
Respondent holds associate's degree	1.48 (1.62)	1.25 (1.41)
Respondent hold's bachelor's degree	4.60 (3.84)	3.73 (3.16)
Respondent holds postgraduate degree	6.46 (6.05)	4.40 (4.18)
Respondent's Parent holds H.S. diploma only	0.72 (0.59)	2.42 (1.68)
Respondent's Parent attended some college	0.73 (0.66)	2.27 (1.84)
Respondent's Parent holds bachelor's degree	0.66 (0.55)	2.20 (1.63)
Respondent's Parent holds postgrad degree	0.58 (0.51)	1.53 (1.19)
Region of Country (vs. East)		
Resides in Midwest	0.27 (0.18)	0.26 (0.20)
Resides in South	0.80 (0.43)	0.66 (0.42)
Resides in Midwest	0.83 (0.45)	0.85 (0.53)
Constant	0.03*** (0.03)	0.02*** (0.01)

Note. Coefficients are reported as odds ratios. Standard errors in parentheses. Reported estimates and standard errors employ the appropriate SPPA survey weights and are adjusted for the stratified sampling. † indicates category was eliminated from this analysis due to collinearity/lack of variation in the outcome.

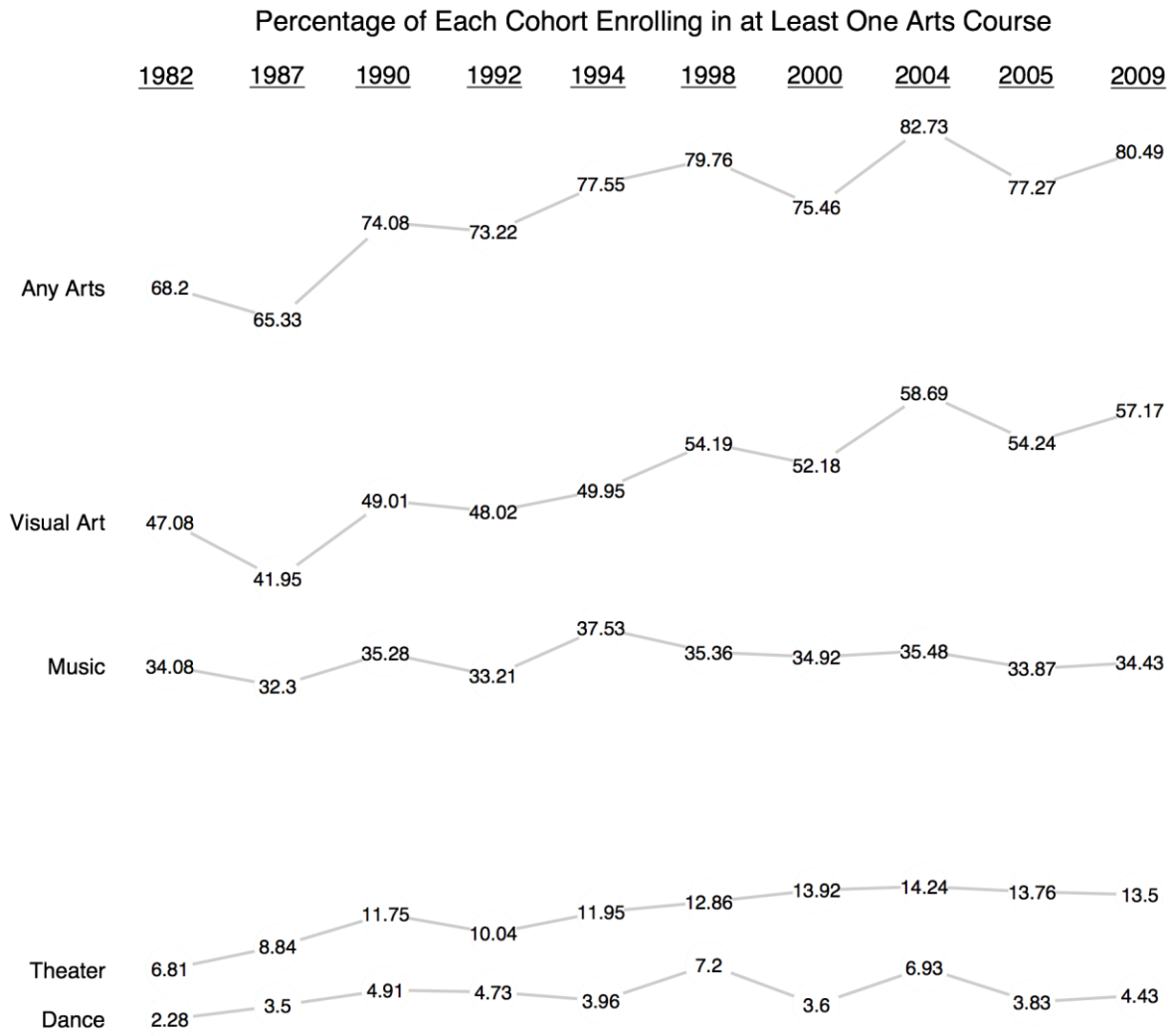
Table 10

Predicted probabilities of donating to arts/cultural organizations by arts education status, educational attainment, and household income

	Probability
Population Average	.12
Respondent's Educational Attainment	
Less than H.S. diploma	.08
H.S. diploma only	.07
Attended some college	.04
Holds associate's degree	.11
Holds bachelor's degree	.24
Holds postgraduate degree	.30
Household income \$50,000+	.12
Household income \$49,999-	.13
School-Based Arts Education	
Yes	.19
No	.04
Arts education	
School music (performance)	.14
School visual art (creation)	.14
School photography/cinema	.08
School theater	.23
School dance	.22
School visual art appreciation	.12
School music appreciation	.23

Note. Predicted probabilities, other than the population average, in this table derive from the logistic regression models reported in Table 9 above, and hold all other covariates constant.

Figure 1



(Source for Music analysis: Elpus, 2014)

Figure 2

Percentage of Each Cohort Persisting in Visual Art, Dance, or Theater Courses

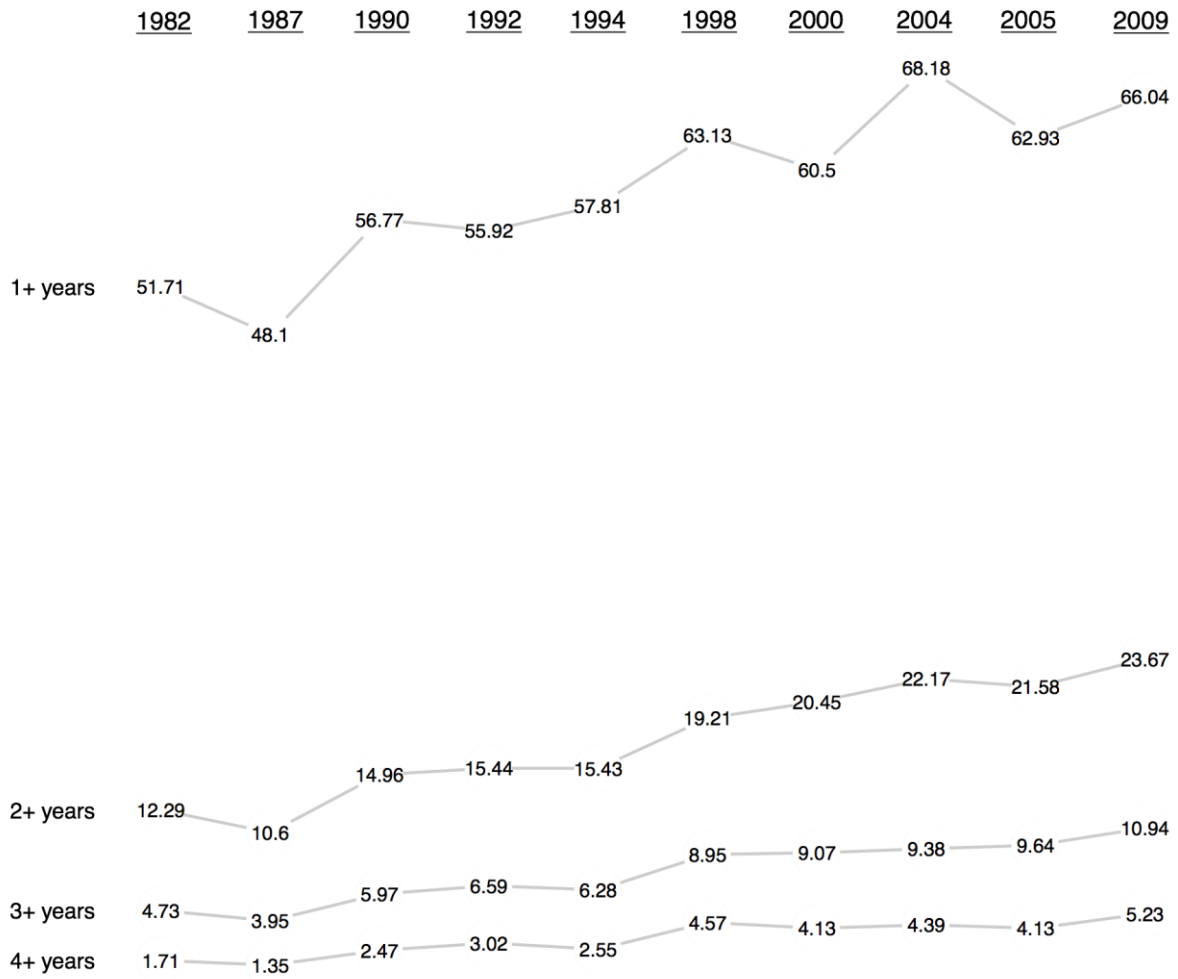
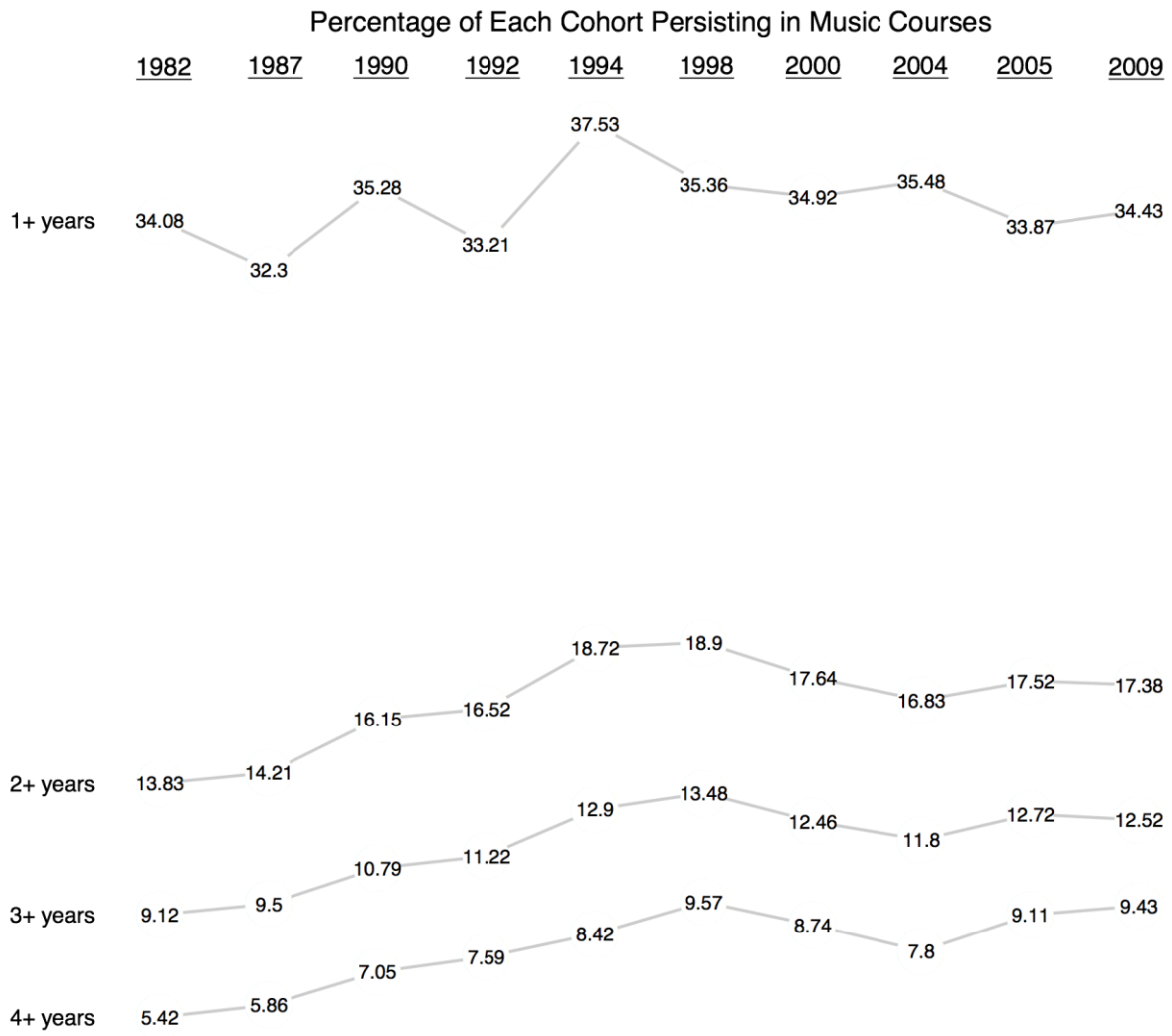


Figure 3



(Source: Elpus, 2014)

Figure 4

Racial/Ethnic Composition Percentages of Visual Art, Theater, and Dance Students

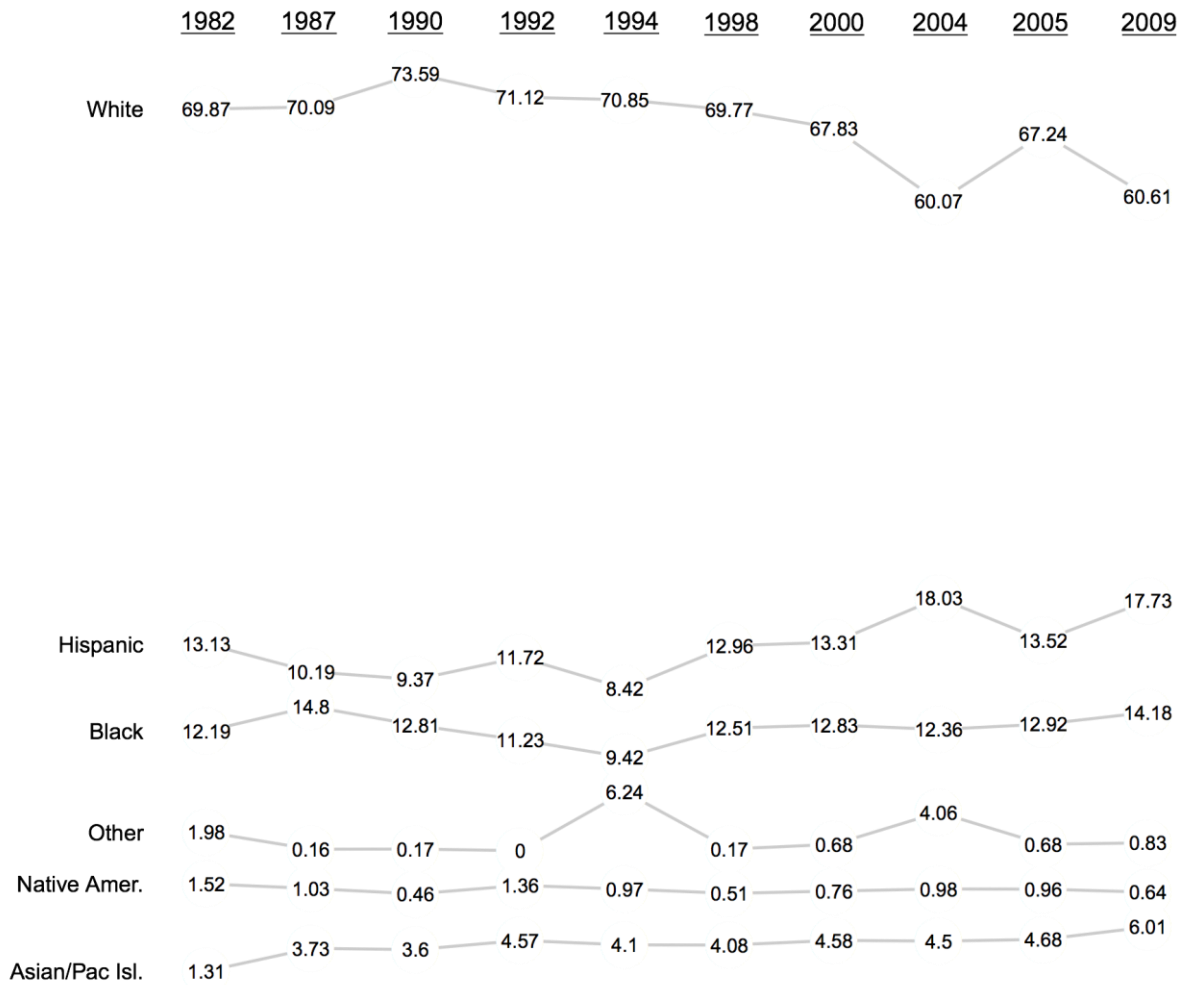
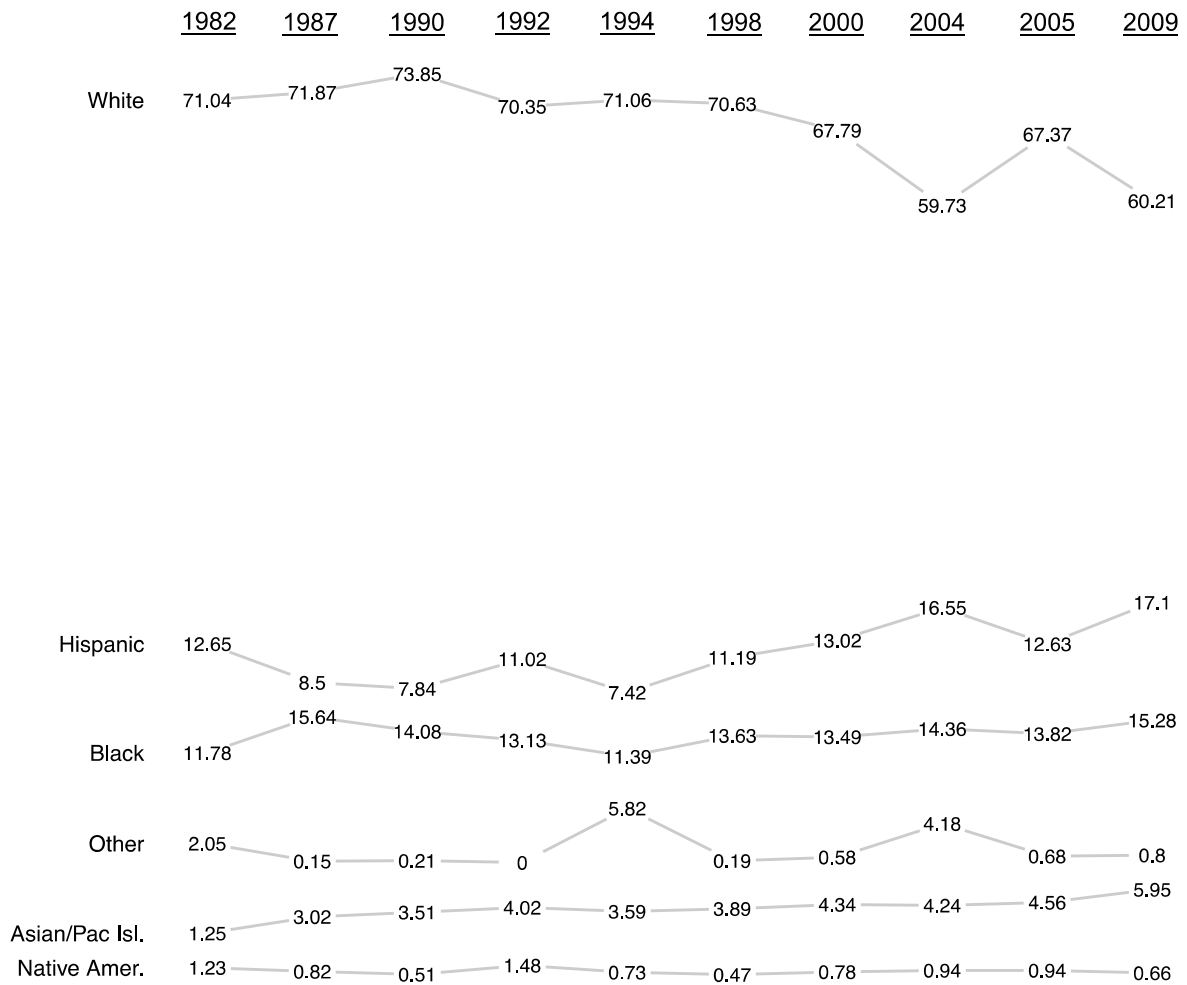


Figure 5

Racial/Ethnic Composition Percentages of All Students in each cohort



Notes

¹ Importantly, although Elpus and Abril (2011) found that White students were overrepresented among music ensemble students and students of Hispanic ethnicity were underrepresented among music ensemble students, students who identified as belonging to other racial or ethnic groups were represented among music students at rates statistically indistinguishable to their proportion in the overall population. Thus, the overrepresentation of White students was balanced entirely on the underrepresentation of students with Hispanic ethnicity.

² The estimates for music presented here were not computed for the present study; rather, they have been previously published elsewhere (Elpus, 2014). More detail on the music estimates than is presented in this document is available in the earlier publication, to which interested readers are directed.

³ Although the modal student graduates high school in four years, it is possible with elective opportunities in high school to take multiple arts courses in one year. This allows for the possibility of taking “more than four years’ worth” of arts courses and still graduate on schedule, which was by far the typical path for students who had “more than four years” of art courses appearing on their transcripts.

⁴ Because of the way ELS data were collected, the “Other” category for the 2004 cohort includes any student for whom more than one race/ethnicity was specified.