Take Me Out to the Opera: Are Sports and Arts Complements? Evidence from the Performing Arts Research Coalition Data

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Abstract
Is arts attendance a substitute or complement for sports attendance? Although many arts managers long have assumed the former several recent studies based on participation surveys have concluded the latter. They find that respondents that are more active attendees of the arts are also more likely to go to sporting events. We explore these conclusions further by using recently released data compiled by the Performing Arts Research Coalition. Using this detailed data on attendance at performing arts events this paper estimates a system of equations designed to both explore the determinants of arts and other leisure activities participation as well as identify whether increased arts consumption corresponds to higher or lower consumption of sports and other leisure activities. The model is estimated both in levels of attendance as well as in the proportion of attendance devoted to each activity. Our results show that while "active" attendees appear more like to attend all types of events, clear patterns of substitution exist between sports and arts, while we find some complementarities between arts events of different types.

Keywords
Arts audience, sports, performing arts, popular culture

Introduction

While there are a number of approaches to studying the art audience, one particular approach is to examine the pattern of audience participation across different types of art and non-art events. Several questions of interest arise in the study of these kinds of patterns of audience participation. For example the correlation of preferences for art and non-art events could be positive, indicating those individuals that liked or attended art events would also attend non-art events.[1] In this case it is harder to argue that increasing opportunities to participate in non-art leisure activities would hurt art participation. On the other hand it is possible that the correlation of preferences is negative. Those with high preferences for art activities would have low preferences for non-art events and we would observe increasing attendance at art events along with decreasing attendance at non-art events. Finally, it is possible that the audiences for the two types of events are composed of entirely different groups of people in which case there

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would be no cross event type effects in consumption. Similar questions could be raised about various art events. For example, what is the relationship between opera and dance consumption? Peterson and Kern (1996) examine the audience participation of individuals they call highbrow, meaning they like both classical music and opera. They examine the tastes of these individuals for music in other genres and find increasing enjoyment of lowbrow music by the highbrow audience. These questions might be of particular interest to the promoters of artistic events. Should a Boston Opera company think of itself as competing for audience with the Red Sox, local ballet, or the Bruce Springsteen concert? Where is the most effective place for artistic advertising?

In our paper we are interested in the pattern of participation between arts (dance, orchestra, opera and theatre), sports (professional and amateur) and popular cultural events (movies, clubs, rock concerts and comedy shows). We will present evidence on the characteristics of the audiences of these ten leisure activities as well as estimate a series of models that attempt to determine to what extent these activities are consumed together by attendees.

Previous research indicates that there is a general belief that doers are doers and so that art attendees are also likely to attend other events. Kopczynski and Hager (2003, p. 7) in research sponsored by the Performing Arts Research Coalition report the following finding:

The research confirms that frequent performing arts attenders are also the most frequent attenders of other leisure activities, including sporting events, movies, festivals, museums, and popular concerts. Attenders were generally more involved with these activities than nonattenders of performing arts events. Rather than an "arts" vs. "other activities" distinction the findings suggest that people generally are either involved in community activities (be it attendance at performing arts events or not) or they are not.

Fernandez-Blanco and Preito-Rodriguez (2000a) report the results of a bivariate probit estimated on a two-equation system for determining the probability of listening to classical and popular music. Estimating a system eliminates the possibility that common demographic characteristics (like income) might cause the correlation in preferences. While they find some differences in the determinants of the two audiences (for example age has a larger negative effect on popular than on classical music) they find the covariance of the errors between the two equations are positive, leading them to conclude that "both groups have common background that we can identify with the presence of an 'innate' taste for music that allows us to believe that, if you are a music fan, you listen to both classical and popular music." (2000, p. 155)

On the other hand there is some evidence that attendance at popular and artistic events will tend to move in opposite directions. Levy-Garboua and Montmarquette (2002) present a taste cultivation model of artistic demand that predicts a negative relationship between artistic consumption and the consumption of popular culture. Since it takes a longer time to develop a taste for artistic performances, their consumption will tend to rise over time in contrast to the consumption of popular events. They report that Kurabayashi and Ito (1992) find that different genres of music show a negative correlation of preference though within genres the correlations are positive which supports their hypothesis.

There has been less research on the relationship between sports and arts attendance. Kopczynski and Hager in research published by the Performing Arts Research Coalition report that frequent attendees of performing arts events are nearly twice as likely to attend professional sporting events and almost three times as likely to attend amateur sporting events than those who are non-attendees. Fernandez-Blanco and Preito-Rodriquez (2000b) report the

results of a bivariate probit estimated on a three equation system for determining the probability of attending live sports, listening to music, and attending cinema. They find that there are positive error covariances between all three activities indicating that sports "do not compete against the consumption of music or cinema." However, they do find substantial differences in the estimated effects of gender and education on live sports attendance and music and cinema consumption with males and those with less education having much higher attendance at sports.

Data

In 2004 the Performing Arts Research Coalition (PARC) completed Arts Participation surveys for 10 cities in the United States (Austin, Washington DC., Boston, Minneapolis/St. Paul, Sarasota, Alaska (urban locations), Cincinnati, Denver, Pittsburgh, and Seattle.) In all, the surveys contain information on about 8,000 respondents. The surveys contain information on attendance at movies, professional sports, amateur sports, live rock, live comedy, nightclubs, dance, opera, theatre, and orchestra. The survey also asks for a variety of demographic and background characteristics (including race, gender, income, education, and age).

Methodology and Model

In order to explore the relationship between attendance and characteristics of different audiences for different events we undertake a series of tests using the PARC data. We conduct four different levels of analysis to investigate these questions. First, we look to see to what extent the audiences for the different types of events overlap and then we compare mean audience characteristics by event type. This allows us to see to what extent the audiences are similar or different. Then we compare simple correlation coefficients of the number of times the respondents attended each type of event. These correlations will reveal the extent to which the pattern of attendance between events is related. However, since these correlations do not control for individual characteristics we cannot know if the results are driven by preferences for events or those characteristics. For example we would expect that income would have a positive impact on attendance at all events. This could show up in the correlation coefficient between event attendance but would be unrelated to tastes for events.

In order to more closely examine preferences we next estimate a system of regressions to control for individual characteristics. This will allow us both to examine the role these play in attendance at different events and for a more precise estimate of the impact of preferences. Our model controls for age (with a series of age dummy variables for ages 25-34, 35-44, 45-54, 55-64, 65+ with under 25 being the omitted category), race (dummy variables for Latino, black, Asian, and other race with white being the omitted category, education (dummy variables for some college, college, and graduate degrees with high school or less being the omitted category), sex (a male dummy), marital status (a married dummy), income (dummy variables for income in thousands: $25-$49, $50-$99, $100-$149, $150+ with less than $25 omitted), number of children under age five, number of children 5-12, and number of children 13-17. We also include dummy variables for the cities included in the study, because the opportunity sets and preferences may differ greatly across cities. In particular the availability of professional sports and some of the performing arts vary from city and city. In all we include ten events as dependent variables, which we group into three categories sports (professional and amateur), popular events (clubs, rock concerts, comedy and movies) and arts (dance, orchestra, opera and theatre).

We estimate the model as a system of equations where the dependent variable is the natural log of the number of times the event is attended (plus 1). We estimate the cross equation error covariances to determine the extent to which any attendance for an event, which is unexplained by demographic variable, is correlated with unexplained attendance at other events. We interpret these covariances as measuring the extent to which preferences for the events are correlated. This is similar to approach used by Fernandez-Blanco and Preito-Rodriguez (2000a, 200b) though their model is a bivariate probit which only considers whether the respondent attended the event (or listened to the music) and not the intensity of interest as measured by the frequency of attendance.

The regression approach outlined above that uses the error covariances to make inferences about preferences will be flawed to the extent that there are omitted variables that impact attendance at multiple events. The impacts of these omitted variables would remain in the residuals from each equation. Positive or negative error covariances could reflect these omitted variables and not cross events preference correlations. One example of this kind would be if the models couldn't fully control for the respondent's preference for going out, which might increase attendance at all events. This critique would apply to the work by to Fernandez-Blanco and Preito-Rodriguez (2000a, 200b) as well as our model. In order to correct this problem we estimate an additional set of equations where the dependent variables are the proportion of all attendance given to that event. This holds the total number of events attended in the year constant and should eliminate the impact of all omitted variables that tend to increase or decrease all attendance. This means that in the dance equation the dependent variable is the total number of dance performances attended divided by total events of all types attended. (Respondents that attended no events are eliminated from this model.) Of course in a two-event world all the error covariances from this approach would have to be negative. However, since we have ten event types we can look for evidence of preference relationships that are more complex. For example we might find that as dance activity share rises, so does the opera activity share, while the sports activity share decreases. This would be much stronger evidence of the relationship in preferences between dance and opera than has been provided by previous research.

Analysis and Results

a.   Audience Characteristics

We begin by looking for similarities and differences among those attending performing arts events and then contrast the portraits of arts attendees with those of the audiences for professional and amateur sports. Table 1 shows the mean demographic characteristics of all those responding to the PARC surveys and of those attending various performing arts and amateur and professional sports. In addition there are data for attendees at clubs, comedy shows, rock concerts and movies.

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Table 1:
Audience Characteristics by Type of Event

	Total Sample	Orchestra	Theatre	Opera	Dance	Club	Comedy	Rock Concert	Movie	Am. Sports	Pro. Sports
Income Lt 25	0.16	0.10	0.11	0.09	0.10	0.13	0.11	0.12	0.13	0.11	0.10
Income 25-50	0.28	0.23	0.24	0.24	0.25	0.28	0.26	0.27	0.28	0.24	0.26
Income 50-100	0.36	0.39	0.39	0.39	0.40	0.38	0.40	0.39	0.38	0.40	0.40
Income 100-150	0.13	0.17	0.17	0.16	0.16	0.14	0.16	0.15	0.14	0.16	0.16
Income 150+	0.07	0.11	0.09	0.11	0.09	0.07	0.08	0.08	0.07	0.09	0.08
Graduate Degree	0.17	0.29	0.23	0.34	0.22	0.18	0.17	0.17	0.18	0.18	0.17
College Degree	0.27	0.33	0.33	0.33	0.33	0.30	0.31	0.32	0.29	0.31	0.31
Some College	0.27	0.25	0.26	0.23	0.27	0.28	0.30	0.28	0.27	0.28	0.26
High School or Less	0.29	0.14	0.19	0.10	0.18	0.25	0.23	0.23	0.26	0.23	0.25
Married	0.63	0.62	0.65	0.61	0.63	0.61	0.63	0.60	0.64	0.66	0.66
Latino	0.07	0.06	0.05	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07
White	0.83	0.87	0.85	0.85	0.83	0.83	0.82	0.85	0.84	0.84	0.86
Black	0.07	0.05	0.07	0.06	0.08	0.07	0.09	0.06	0.07	0.07	0.07
Asian	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.03	0.02	0.02
Other Race	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.04
Age	44.92	47.46	45.17	46.59	43.13	40.17	41.96	37.85	42.68	41.77	42.01
Male	0.46	0.45	0.42	0.45	0.39	0.49	0.47	0.50	0.46	0.54	0.53
Number of children in household -- under 5	0.21	0.14	0.18	0.16	0.20	0.21	0.20	0.19	0.21	0.21	0.22
Number of children in household -- 5 to 12	0.31	0.24	0.29	0.21	0.32	0.30	0.30	0.32	0.34	0.37	0.33
Number of children in household -- 13 to 17	0.21	0.21	0.22	0.15	0.24	0.21	0.21	0.23	0.23	0.29	0.24

The typical audience members at orchestra and at opera performances look much alike. At age 47 they are older (by 2 years) than those in the entire sample and than those in any other audience. They also have more education and are slightly more female than all the respondents combined. Theatre attendees are only slightly younger with less graduate education. Dance audiences, however, differ most among those for the performing arts. They have the highest proportion of females (61 percent) and an average age (43) that is lower than that for other performing arts and close to that for the movies. The proportion with graduate and college degrees, however, is similar to that for theatre and higher than for any non-arts audience. As compared to the entire sample, the audiences for all four performing arts are more highly represented in the income categories of $50,000 and above and less in those below that amount. The proportion of the arts audiences at each income levels is quite like that for sports attendees, while skewed higher than those for other audiences.

Sports audiences look similar to performing arts audiences in income, but substantial differences exist between them. Gender is perhaps the most conspicuous. Although the sample was only 46 percent male and arts audiences ranged from 39 to 45 percent male, men make up 54 percent and 53 percent of the amateur and professional sports attendees. Sports audiences are also younger at about 42 years. The only audience groups included in the survey who are junior to them on average are those attending clubs and rock concerts at 40 years and 39 years, respectively. The proportion of sports audiences with graduate degrees equals that for the entire sample, while the proportion of college graduates is larger. By both measures, arts audiences are more educated than those at sports events.

Those attending amateur and professional sports have more children than those in the full sample. A substantially higher percentage of those going to amateur sports have children ages 5 to 12. It is also noteworthy that the highest percent married of any audience group are those attending amateur sports. (Married men escaping home with their children?)

b.   Attendance Patterns

Tables 2 and 3 show the number of times respondents attended each of the events and event types. Movies are the most popular event with respondents attending over eight movies a year. Orchestra, opera, and comedy clubs are attended the least with the average respondent going to less than one of these types of events each year. It is readily apparent in Table 3 that the typical respondent attends multiple types of events. Forty-three percent attended an art event, a sports event and a popular culture event. This indicates that there is substantial audience overlap. It is infrequent for someone to attend only one event type. In fact only 1.4 percent of the respondents attended only art events and only 2 percent attended only sports events, suggesting that idea that the sports audience and the arts audience are substantially composed of different individuals is not accurate.

Table 2:
Attendance by Activity - Mean Number of Times Attended Per Year

	N	**Mean**
Art	7983	4.3
Dance	8055	1.2
Opera	8138	0.3
Orchestra	8121	0.8
Theatre	7983	2.0
Sports	8130	6.7
Professional Sports	8138	3.2
Amateur Sports	8130	3.5
Popular	8121	15.0
Rock Concert	8155	1.5
Comedy	8149	0.6
Club	8121	4.7
Movies	8119	8.2

Table 3:
Attendance Patterns

	N	**Percent**
Sports, Popular and Arts	3490	43.2%
Popular and Art	1426	17.6%
Sports and Popular	1367	16.9%
	N	**Percent**
Popular	900	11.1%
None	539	6.7%
Sports	159	2.0%
Art	113	1.4%
Sport and Art	94	1.2%
Total	8088	100.0%

c. Event Correlations

Table 4 shows the correlation coefficients between the numbers of times each event was attended. There is a significant positive correlation between almost every event pair with the exception of opera and orchestra, which have a non-significant correlation with professional and amateur sports and club attendance. Sports and popular events do have significant positive correlations with the other two arts: dance and theater. Overall this table supports the idea that sports and popular culture to not compete for audience. The general patterns, however, do conform to preconceptions about which events go together. The highest correlations are within events types (sports, popular events, and arts) and the correlations between events of different types while generally significant are smaller in magnitude.

Table 4
Correlation Coefficients between Event Attendance

Correlations

		DATT	OPERA	ORCH	THEAT	MOVIES	PROSPORT	AMSPORT	ROCK	COMEDY	CLUB
DATT	Pearson Correlation	1	.216**	.248**	.413**	.109**	.066**	.048**	.069**	.117**	.096*
	Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	8055	8033	8014	7895	8010	8029	8024	8046	8039	8013
OPERA	Pearson Correlation	.216**	1	.338**	.252**	.040**	.022	-.001	.051**	.026*	.004
	Sig. (2-tailed)	.000	.	.000	.000	.000	.051	.951	.000	.021	.746
	N	8033	8138	8099	7964	8092	8113	8104	8128	8123	8094
ORCH	Pearson Correlation	.248**	.338**	1	.300**	.051**	.014	.010	.039**	.025*	.015
	Sig. (2-tailed)	.000	.000	.	.000	.000	.213	.357	.001	.023	.186
	N	8014	8099	8121	7947	8076	8096	8087	8111	8105	8078
THEAT	Pearson Correlation	.413**	.252**	.300**	1	.125**	.077**	.033**	.092**	.113**	.036*
	Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.004	.000	.000	.001
	N	7895	7964	7947	7983	7942	7961	7950	7973	7968	7943
MOVIES	Pearson Correlation	.109**	.040**	.051**	.125**	1	.159**	.067**	.159**	.129**	.230*
	Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000	.000
	N	8010	8092	8076	7942	8119	8099	8090	8111	8105	8081
PROSPORT	Pearson Correlation	.066**	.022	.014	.077**	.159**	1	.236**	.104**	.120**	.159*
	Sig. (2-tailed)	.000	.051	.213	.000	.000	.	.000	.000	.000	.000
	N	8029	8113	8096	7961	8099	8138	8107	8128	8123	8096
AMSPORT	Pearson Correlation	.048**	-.001	.010	.033**	.067**	.236**	1	.045**	.097**	.070*
	Sig. (2-tailed)	.000	.951	.357	.004	.000	.000	.	.000	.000	.000
	N	8024	8104	8087	7950	8090	8107	8130	8123	8115	8089
ROCK	Pearson Correlation	.069**	.051**	.039**	.092**	.159**	.104**	.045**	1	.126**	.350*
	Sig. (2-tailed)	.000	.000	.001	.000	.000	.000	.000	.	.000	.000
	N	8046	8128	8111	7973	8111	8128	8123	8155	8141	8113
COMEDY	Pearson Correlation	.117**	.026*	.025*	.113**	.129**	.120**	.097**	.126**	1	.147*
	Sig. (2-tailed)	.000	.021	.023	.000	.000	.000	.000	.000	.	.000
	N	8039	8123	8105	7968	8105	8123	8115	8141	8149	8111
CLUB	Pearson Correlation	.096**	.004	.015	.036**	.230**	.159**	.070**	.350**	.147**	1
	Sig. (2-tailed)	.000	.746	.186	.001	.000	.000	.000	.000	.000	.
	N	8013	8094	8078	7943	8081	8096	8089	8113	8111	8121

**· Correlation is significant at the 0.01 level (2-tailed).
*· Correlation is significant at the 0.05 level (2-tailed).

DATT is dance attendance

d. Attendance Regressions

The regression results in Table 5 provide another way of analyzing and comparing the audiences for arts and for sports. Holding other influences constant, the effect of age on attendance varies greatly among the performing arts. For orchestra concerts age has a positive effect from age 55. Those 55 to 64 have a nine percent larger attendance and those 65 and older a 17 percent larger attendance, than those under 25. There are no significant differences among younger age cohorts. Opera attendance also is significantly higher for those 65 plus but otherwise appears unrelated to age. Theatre attendance, in contrast, is significantly lower, by 12

to 18 percent, for the 3 decadal age cohorts from ages 25 to 54 as compared to younger respondents. Attendance by the oldest cohorts does not differ significantly from that for this youngest group. Dance attendance is significantly less for all age cohorts as compared to those under 25.

Attending sports events is consistently and negatively related to age. For professional sports the percentage decline is continuous through all the age groups, moving from a 19 percent smaller attendance for 25 to 34 year olds, as compared to those under 25, to a 55 percent decrease for those over 65. For amateur sports the percentage decline is also large and clearly separates those under 25 from all the rest of the respondents. The decline is 44 percent for those 25 to 34, rising to 50 percent for those over 65.

Audiences at all of the performing arts and at both amateur and professional sports consistently increase with rising income. Among the performing arts the largest percentage changes are for theatre and dance attendance, with opera the least affected. The coefficients for amateur sports are roughly similar to those for theatre, rising from .10 for incomes of $25,000 to $50,000 to .49 for incomes over $150,000. However, the audiences for professional sports show the largest effects. The percent change in attendance as compared with those with incomes under $25,000 rises from 20 percent for respondents with incomes of $25,000 to $50,000 to 71 percent for those making $150,000 or more.

The only significant effect of race on attendance at sporting events is the lower participation by Asians as compared to the omitted whites at both amateur and professional sports. Race plays a role, however, in the determination of audiences at arts and other performances. Asians attend not only sports events less frequently than whites, but also orchestra concerts, the theatre, rock concerts, and comedy clubs. Latinos, in contrast, have increased rates of participation in the audiences for orchestras, opera, dance and movies, and only lower rates for rock concerts. The coefficients for black attendance are negative for orchestra, movies, and rock concerts, but positive for comedy clubs and dance.

One striking difference between sports and other audiences is that being married negatively affects attendance at all types of performances except comedy clubs, but is not significantly related to who makes up amateur or professional sports audiences. Being male is negatively related to attending movies, theatre and dance, but is positively associated with attendance at rock concerts and clubs. Not surprisingly the biggest impact of being male is on sports attendance. It increases attending a professional sport by 26 percent and, an amateur event by 17 percent. Children in a household can affect audiences. Children five and under are negatively related to attending movies, the theatre, rock concerts, comedy and clubs. Children 12 and over, on the other hand, are associated with higher attendance at movies and especially at amateur sports.

Table 5:
Attendance Regressions-Dependent Variable Log of Number of Times Event Attended Plus 1

Variable	Orchestra Coeff	Orchestra T-Stat	Theatre Coeff	Theatre T-Stat	Opera Coeff	Opera T-Stat	Dance Coeff	Dance T-Stat	Professional Sports Coeff	Professional Sports T-Stat	Amateur Sports Coeff	Amateur Sports T-Stat	Rock Concert Coeff	Rock Concert T-Stat	Comedy Coeff	Comedy T-Stat	Movies Coeff	Movies T-Stat	Clubs Coeff	Clubs T-Stat
Age 25-34	-0.05	-1.60	**-0.16**	**-4.36**	-0.03	-1.46	**-0.11**	**-3.19**	**-0.19**	**-4.13**	**-0.44**	**-9.08**	**-0.20**	**-5.71**	-0.02	-0.87	**-0.49**	**-10.26**	**-0.11**	**-2.09**
Age 35-44	-0.02	-0.79	**-0.18**	**-4.74**	-0.01	-0.85	**-0.15**	**-4.27**	**-0.30**	**-6.62**	**-0.44**	**-8.88**	**-0.40**	**-11.52**	**-0.12**	**-5.11**	**-0.78**	**-16.23**	**-0.51**	**-9.90**
Age 45-54	0.04	1.23	**-0.12**	**-3.13**	-0.01	-0.79	**-0.17**	**-4.87**	**-0.46**	**-9.94**	**-0.45**	**-9.01**	**-0.60**	**-16.76**	**-0.15**	**-5.86**	**-0.95**	**-19.40**	**-0.77**	**-14.65**
Age 55-64	**0.09**	**2.84**	-0.02	-0.50	0.02	0.96	**-0.16**	**-4.05**	**-0.54**	**-10.60**	**-0.49**	**-8.93**	**-0.79**	**-20.20**	**-0.18**	**-6.42**	**-1.10**	**-20.20**	**-1.01**	**-17.28**
Age 65+	**0.17**	**5.24**	0.04	0.92	**0.07**	**3.29**	**-0.16**	**-4.14**	**-0.55**	**-10.49**	**-0.50**	**-8.94**	**-0.90**	**-22.75**	**-0.15**	**-5.35**	**-1.26**	**-22.97**	**-1.17**	**-19.80**
Latino	**0.08**	**2.49**	0.02	0.41	**0.04**	**2.32**	**0.11**	**3.04**	0.09	1.89	-0.04	-0.76	**-0.12**	**-3.26**	-0.01	-0.21	**0.10**	**2.01**	0.04	0.64
Black	**-0.09**	**-3.09**	0.03	0.87	-0.01	-0.44	**0.07**	**2.14**	-0.01	-0.24	-0.08	-1.59	**-0.22**	**-6.17**	**0.13**	**5.36**	-0.08	-1.65	-0.02	-0.43
Asian	**-0.12**	**-2.34**	**-0.28**	**-4.23**	0.00	-0.15	-0.01	-0.24	**-0.32**	**-4.00**	**-0.32**	**-3.77**	**-0.31**	**-5.11**	**-0.11**	**-2.54**	-0.03	-0.36	**-0.27**	**-3.01**
Other race	-0.04	-1.04	0.02	0.39	0.00	0.11	0.00	0.05	-0.11	-1.88	-0.03	-0.41	-0.04	-1.00	0.06	1.85	-0.11	-1.80	0.08	1.29
Married	**-0.05**	**-2.88**	**-0.05**	**-2.38**	**-0.02**	**-2.26**	**-0.07**	**-3.23**	-0.05	-1.69	-0.03	-0.91	**-0.10**	**-4.77**	-0.02	-1.32	**-0.07**	**-2.31**	**-0.28**	**-8.92**
Grad degree	**0.34**	**13.90**	**0.59**	**18.36**	**0.16**	**10.83**	**0.29**	**9.99**	0.03	0.89	**0.20**	**4.64**	0.04	1.33	0.01	0.41	**0.34**	**8.30**	0.04	0.83
College	**0.20**	**9.63**	**0.40**	**14.64**	**0.08**	**6.39**	**0.24**	**9.51**	**0.14**	**4.12**	**0.24**	**6.62**	**0.09**	**3.63**	**0.06**	**3.11**	**0.30**	**8.48**	0.07	1.75
Some college	**0.11**	**5.84**	**0.22**	**8.38**	**0.04**	**3.32**	**0.15**	**6.26**	0.05	1.65	**0.17**	**5.15**	**0.07**	**3.06**	**0.06**	**3.65**	**0.20**	**6.13**	0.13	**3.60**
Income 25-50	**0.05**	**2.05**	**0.11**	**3.61**	**0.03**	**2.28**	**0.11**	**3.80**	**0.20**	**5.33**	**0.10**	**2.41**	0.06	1.92	**0.06**	**2.94**	**0.23**	**5.83**	0.24	**5.59**
Income 50-100	**0.11**	**4.50**	**0.27**	**8.25**	**0.05**	**3.49**	**0.23**	**7.56**	**0.43**	**10.88**	**0.26**	**6.10**	**0.15**	**4.76**	**0.12**	**5.53**	**0.38**	**9.12**	0.34	**7.49**
Income 100-150	**0.13**	**4.20**	**0.38**	**9.19**	**0.06**	**3.32**	**0.25**	**6.72**	**0.55**	**11.18**	**0.39**	**7.35**	**0.19**	**4.90**	**0.15**	**5.56**	**0.50**	**9.60**	0.39	**7.02**
Income 150+	**0.21**	**5.56**	**0.45**	**9.19**	**0.11**	**4.59**	**0.35**	**7.74**	**0.71**	**11.91**	**0.49**	**7.68**	**0.24**	**5.33**	**0.17**	**5.32**	**0.48**	**7.57**	0.39	**5.77**
Austin	**-0.15**	**-4.70**	**-0.13**	**-2.98**	**0.06**	**3.01**	0.00	-0.11	**-0.13**	**-2.57**	**0.16**	**2.91**	**0.11**	**2.87**	-0.03	-1.24	0.10	1.95	0.28	**4.79**
DC	-0.01	-0.36	-0.05	-1.13	**0.06**	**2.84**	-0.02	-0.62	**-0.11**	**-2.03**	-0.03	-0.58	**-0.09**	**-2.26**	**-0.10**	**-3.61**	**0.16**	**2.87**	-0.10	-1.69
Pittsburg	**-0.20**	**-6.00**	-0.01	-0.26	0.01	0.47	**-0.11**	**-2.79**	**0.23**	**4.34**	**0.16**	**2.82**	-0.03	-0.70	**-0.13**	**-4.40**	-0.07	-1.31	0.04	0.61
Minneapolis	**-0.15**	**-4.71**	-0.04	-1.08	-0.01	-0.48	**-0.13**	**-3.53**	**0.11**	**2.19**	0.08	1.46	**-0.09**	**-2.27**	**-0.07**	**-2.81**	**0.11**	**2.12**	-0.04	-0.75
Cinncinati	**-0.10**	**-3.19**	0.03	0.57	0.03	1.32	**-0.10**	**-2.63**	**0.23**	**4.38**	**0.20**	**3.53**	-0.06	-1.52	**-0.11**	**-3.99**	-0.01	-0.25	-0.03	-0.56
Alaska	**-0.11**	**-3.26**	-0.08	-1.86	**0.05**	**2.66**	0.07	1.84	**-0.11**	**-2.09**	0.11	1.86	**-0.29**	**-7.25**	**-0.09**	**-3.15**	**0.17**	**3.10**	0.08	1.29
Denver	**-0.16**	**-4.80**	0.04	0.95	0.02	0.92	**-0.09**	**-2.36**	**0.24**	**4.45**	-0.05	-0.92	-0.03	-0.66	-0.01	-0.31	**0.15**	**2.59**	-0.02	-0.31
Sarasota	-0.05	-1.55	-0.02	-0.40	0.03	1.65	0.02	0.53	-0.03	-0.55	**-0.14**	**-2.43**	-0.04	-1.04	0.05	1.62	0.10	1.72	**0.22**	**3.58**
Seattle	**-0.19**	**-5.69**	-0.02	-0.43	**0.06**	**3.05**	-0.03	-0.87	**0.22**	**4.24**	-0.06	-1.02	**-0.10**	**-2.53**	**-0.09**	**-3.18**	**0.12**	**2.21**	-0.09	-1.47
Male	-0.01	-0.99	**-0.15**	**-7.80**	-0.01	-1.40	**-0.16**	**-9.23**	**0.26**	**10.99**	**0.17**	**6.66**	**0.07**	**4.08**	0.01	0.98	**-0.09**	**-3.55**	0.16	**5.95**
Children LT 5	-0.02	-1.65	**-0.07**	**-3.93**	0.00	0.02	-0.03	-1.46	-0.04	-1.59	-0.03	-1.28	**-0.15**	**-8.48**	**-0.02**	**-1.97**	**-0.23**	**-9.28**	**-0.17**	**-6.67**
Children 5-12	-0.01	-0.88	0.00	-0.19	-0.01	-1.33	0.00	-0.12	-0.03	-1.89	**0.14**	**6.94**	**-0.05**	**-3.44**	0.00	-0.22	0.02	0.83	**-0.10**	**-4.61**
Children 13-17	0.02	1.33	0.02	0.99	-0.01	-1.24	0.04	2.14	0.04	1.83	**0.26**	**10.68**	-0.03	-1.50	0.01	0.48	**0.05**	**2.14**	-0.05	-1.95
Intercept	**0.20**	**5.40**	**0.48**	**9.72**	-0.01	-0.24	**0.40**	**8.92**	**0.66**	**11.24**	**0.58**	**9.14**	**0.97**	**21.49**	**0.31**	**9.68**	**2.01**	**32.21**	**1.36**	**20.34**

Bold: Significant at the 95% level.
Omitted categories age less than 25, white, income less than $25,000, high school education or less.

Education plays a very different role in defining sports and performing arts attendance. Audiences for the performing arts increase consistently with more education. The effect on theatre audiences is especially large. As compared to those with no college, respondents with some college have 22 percent, those finishing college, 40 percent, and those with graduate degrees, 59 percent higher attendance. Attendance at movies also increases with education. For sports the level of education matters less. The audiences for professional sports are little affected, although college graduation has a significant positive effect. Attendance at amateur sports is significantly higher for those with some education beyond high school, with the largest percentage effect for college graduates.

Finally, there are intercity differences in attendance that may arise from taste and tradition, and also from availability. Here are a few results when attendance in the other places is compared to that in Boston, the omitted city. Orchestra attendance is significantly lower in seven of the nine cities. The majority of the city coefficients for the other performing arts, however, are insignificant when Boston is the basis of comparison. Professional sports attendance is significantly higher in Pittsburgh, Minneapolis, Cincinnati, Denver and Seattle, though lower in Austin, the District of Columbia and Alaska. Attendance at amateur sports appears less connected to location but is higher in Austin, Cincinnati, and Pittsburgh than in Boston, while lower in Sarasota.

All in all there are do appear to be substantial differences in the demographic effects on attendance of various event types. To explore the relationships between preferences over event types Table 6 show the error covariances between equations. In results similar to those of the correlations from Table 4 there are significant positive correlations between all event types with the lone exception of opera and amateur sports. Again providing little evidence that sports and arts compete for audience. As before the covariances within event type are larger than those between event types. Professional sports are most highly correlated with amateur sports and orchestra is the most highly correlated with opera. These results are similar to those reported by Fernandez-Blanco and Preito-Rodriguez (2000a, 200b) who also find positive correlations between events in residuals from models controlling for basic demographic variables.

Table 6:
Error Covariances from Attendance Share Regressions

	Prof. Sports	Am. Sports	Orchestra	Theatre	Dance	Opera	Comedy	Rock	Club	Movies
Professional Sports	1.00									
Amateur Sports	0.37	1.00								
Orchestra	0.06	0.03	1.00							
Theatre	0.14	0.09	0.30	1.00						
Dance	0.11	0.08	0.27	0.42	1.00					
Opera	0.04	0.00	0.29	0.23	0.23	1.00				
Comedy	0.20	0.15	0.08	0.21	0.18	0.07	1.00			
Rock Concert	0.20	0.11	0.09	0.18	0.13	0.04	0.19	1.00		
Club	0.20	0.11	0.08	0.15	0.16	0.04	0.23	0.38	1.00	
Movies	0.20	0.10	0.10	0.23	0.14	0.07	0.18	0.19	0.21	1.00

e. Proportion of Attendance Regressions

A third way of examining attendance at performing arts, sports, and other events is by looking at the proportionate way that respondents divide their time among them. Table 7 contains regressions in which the dependent variables are the percentage of attendance time devoted to each activity. Looking at the performing arts, age has a large effect on attendance choices for both orchestras and theatres. Beginning at age 45, the share of attendance time increases with age. For opera and dance the pattern is a bit weaker, but those 65 and over allocate 2 percent more of their attendance time to opera, while those 55 to 64 and those 65 and over devote that much more of their attendance to dance. The attendance that increasingly declines with age is that at rock concerts and at clubs and for the older age cohorts, movies.

The pattern is different for professional sports. Although we previously found that the frequency of attendance at professional sports is negatively related to age, the proportion of attendance time is little affected. Indeed, compared to respondents under 25, those 35 to 44 and those 65 and over spend 2 percent and 3 percent more of their attendance time, respectively, at professional sports. For amateur sports the only significant coefficient shows a negative 3 percent effect of being in the 25 to 34 year old cohort.

Rising income has increasing effects on the proportion of attendance time spent at professional sports, but no significant effect for amateur sports. The only other significant effect of rising income is to decrease the proportion of time spent at movies and to increase the share at the theatre.

As noted earlier, attendance rates rise with education. The way that attendance is distributed also is affected. Those with education beyond high school devote less of their attendance time to professional sports and in the cases of those with college and some college more time to amateur sports. The proportion of time devoted to each of the performing arts increases, while that devoted to movies declines and, for those with graduate degrees, the attendance share at comedy shows, rock concerts and clubs.

Although being married does not affect the frequency of sports attendance, it increases the share of sports attendance. Also, while negatively related to the level of movie attendance it increases the proportion of attendance time spent there. Number of children negatively affects the share of attendance time spent at clubs and rock concerts and increases the share at amateur sports. Being male increases the proportion of attendance at professional sports and decreases that at rock concerts and clubs.

The significant effects of race on the allocation of attendance include lowering the importance of rock concerts for blacks and Latinos as compared to whites. For blacks the percentage of attendance at orchestral concerts is also lower, but higher for theatre, dance and comedy shows. Asians spend less of their attendance time at amateur sports, the theatre, and rock concerts and more at the movies.

The alternative use of attendance time varies across cities, but in most cases there is a significantly smaller proportion of time, as compared to Boston, devoted to rock concerts and clubs, while cities with more professional sports teams have more attendance at professional sports

Table 7:
Attendance Share Regressions-Dependent Variable Percent of Total Events Attended That Were in This Category

Variable	Orchestra		Opera		Theatre		Dance		Professional Sports		Amateur Sports		Rock		Comedy		Movies		Club	
	Coeff	T-Stat	Coeff	T-Stat	Coeff	T-Stat	Coeff	T-Stat	Coeff	T-Stat	Coeff	T-Stat	Coeff	T-Stat	Coeff	T-Stat	Coeff	T-Stat	Coeff	T-Stat
Age 25-34	0.00	-0.39	0.00	-0.82	-0.01	-1.46	0.00	-0.15	0.01	1.63	**-0.03**	**-3.11**	0.00	-0.93	**0.01**	**3.19**	-0.02	-1.13	**0.04**	**3.80**
Age 35-44	0.01	1.75	0.00	0.61	0.01	0.89	0.00	0.98	**0.02**	**2.76**	-0.01	-0.89	**-0.01**	**-2.89**	0.00	1.39	-0.02	-1.52	0.00	-0.49
Age 45-54	**0.02**	**4.06**	0.00	1.42	**0.03**	**3.84**	0.01	1.84	0.02	1.79	0.01	0.63	**-0.03**	**-5.52**	0.01	1.63	-0.02	-1.56	**-0.03**	**-3.32**
Age 55-64	**0.03**	**6.42**	0.00	1.64	**0.06**	**8.37**	**0.02**	**2.75**	0.02	1.62	0.01	1.29	**-0.05**	**-9.19**	0.00	0.67	**-0.03**	**-2.07**	**-0.06**	**-5.46**
Age 65+	**0.05**	**9.12**	**0.02**	**5.58**	**0.08**	**10.98**	**0.02**	**3.28**	**0.03**	**3.26**	0.02	1.89	**-0.07**	**-12.31**	0.01	1.94	**-0.06**	**-3.63**	**-0.10**	**-8.19**
Latino	0.00	0.46	0.00	1.00	0.00	-0.49	0.00	0.80	0.00	0.34	-0.01	-1.15	**-0.02**	**-3.93**	0.00	-1.00	0.02	1.03	0.01	1.10
Black	**-0.01**	**-2.29**	0.00	-0.71	**0.02**	**2.85**	**0.02**	**3.28**	0.00	-0.25	-0.02	-1.68	**-0.03**	**-5.09**	**0.01**	**4.15**	0.01	0.51	0.00	-0.08
Asian	0.00	0.46	0.00	0.85	**-0.02**	**-2.15**	0.01	1.24	-0.02	-1.40	**-0.03**	**-2.05**	**-0.03**	**-3.27**	0.00	0.02	**0.12**	**4.78**	-0.03	-1.40
Other race	0.00	-0.21	0.00	0.65	0.00	0.57	0.00	0.07	-0.01	-1.25	-0.01	-0.87	0.00	-0.38	0.00	0.32	0.00	0.03	0.02	1.54
Married	0.00	-1.15	0.00	0.75	0.00	0.56	-0.01	-1.94	**0.01**	**2.43**	**0.01**	**2.22**	0.00	-1.22	0.00	0.90	**0.02**	**2.30**	**-0.04**	**-6.05**
Grad degree	**0.03**	**8.82**	**0.02**	**8.69**	**0.07**	**12.04**	**0.02**	**5.30**	**-0.04**	**-4.91**	0.01	1.25	**-0.01**	**-2.49**	**-0.01**	**-3.15**	**-0.04**	**-3.11**	**-0.06**	**-6.46**
College	**0.02**	**5.67**	**0.01**	**4.31**	**0.04**	**8.34**	**0.02**	**5.04**	**-0.02**	**-2.94**	**0.02**	**2.73**	-0.01	-1.45	0.00	-1.43	**-0.03**	**-2.79**	**-0.05**	**-6.18**
Some college	**0.01**	**3.71**	0.00	**2.34**	**0.02**	**4.70**	**0.01**	**3.96**	**-0.03**	**-4.07**	**0.02**	**2.48**	0.00	-0.99	0.00	-0.68	**-0.03**	**-2.79**	-0.01	-1.33
Income 25-50	0.00	0.92	0.00	0.18	0.01	1.26	0.00	0.17	0.00	0.08	0.00	0.17	0.00	-0.73	0.00	-0.44	-0.02	-1.94	0.01	1.58
Income 50-100	0.00	1.03	0.00	0.01	**0.01**	**2.48**	0.01	1.70	**0.02**	**2.98**	0.00	0.77	0.00	-0.26	0.00	-0.86	**-0.06**	**-4.33**	0.00	0.18
Income 100-150	0.00	0.63	0.00	-0.35	**0.02**	**2.49**	0.01	1.33	**0.03**	**2.86**	0.02	1.62	-0.01	-1.02	0.00	-0.84	**-0.06**	**-3.78**	-0.01	-0.48
Income 150+	0.01	1.32	0.00	0.89	**0.02**	**2.10**	0.01	1.84	**0.04**	**3.29**	0.02	1.40	0.00	-0.41	0.00	-0.68	**-0.09**	**-5.00**	0.00	0.14
DC	**0.01**	**2.49**	0.00	**1.97**	0.01	1.03	0.00	0.63	0.00	-0.18	-0.02	-1.67	**-0.02**	**-3.01**	0.00	-1.18	**0.06**	**4.06**	**-0.05**	**-4.56**
Pittsburg	**-0.02**	**-3.30**	0.00	-0.46	**0.03**	**4.66**	**-0.01**	**-2.18**	**0.06**	**6.38**	0.01	1.20	**-0.01**	**-2.08**	**-0.01**	**-2.69**	**-0.03**	**-2.25**	**-0.02**	**-2.03**
Minneapolis	-0.01	-1.28	0.00	-0.53	**0.02**	**2.87**	**-0.01**	**-2.63**	**0.04**	**4.29**	0.01	0.81	**-0.02**	**-4.18**	0.00	-1.05	0.02	1.82	**-0.04**	**-4.47**
Cinncinati	0.00	0.39	0.00	0.11	**0.02**	**2.95**	-0.01	-1.24	**0.05**	**5.98**	0.01	1.26	**-0.01**	**-2.66**	**-0.01**	**-2.38**	-0.02	-1.64	**-0.04**	**-3.52**
Alaska	0.00	-0.06	**0.01**	**2.15**	0.01	1.49	**0.02**	**4.60**	0.00	-0.37	-0.01	-0.87	**-0.04**	**-9.00**	**-0.01**	**-2.61**	**0.04**	**3.01**	-0.02	-1.50
Denver	-0.01	-1.40	0.00	0.63	**0.02**	**2.47**	-0.01	-1.79	**0.06**	**6.35**	**-0.03**	**-3.50**	**-0.01**	**-2.75**	0.00	0.14	0.02	1.60	**-0.04**	**-3.46**
Sarasota	0.01	1.41	0.00	0.63	0.01	1.06	0.00	0.88	0.00	-0.16	**-0.05**	**-4.96**	-0.01	-2.20	**0.01**	**3.20**	0.01	0.45	**0.02**	**2.32**
Seattle	**-0.01**	**-2.94**	**0.01**	**2.19**	**0.02**	**2.70**	0.00	-0.36	**0.06**	**7.05**	**-0.03**	**-3.11**	-0.01	**-3.00**	**-0.01**	**-2.79**	**0.04**	**2.63**	**-0.05**	**-5.25**
Male	**0.00**	**-2.09**	0.00	-1.90	**-0.03**	**-7.60**	**-0.02**	**-8.51**	**0.05**	**10.56**	**0.02**	**4.13**	**0.01**	**3.86**	0.00	-0.47	**-0.05**	**-7.44**	**0.03**	**5.92**
Children LT 5	0.00	0.35	0.00	0.92	0.00	0.50	0.00	1.52	**0.01**	**3.29**	0.01	1.78	**-0.01**	**-4.37**	0.00	0.42	-0.01	-1.27	**-0.01**	**-2.27**
Children 5-12	0.00	-0.27	0.00	-1.58	0.00	-0.31	0.00	0.08	**-0.01**	**-2.65**	**0.03**	**7.88**	**-0.01**	**-3.15**	0.00	0.41	0.01	1.13	**-0.02**	**-4.67**
Children 13-17	0.00	0.08	0.00	-1.93	0.00	-1.57	0.00	0.51	0.00	-1.13	**0.05**	**9.96**	**-0.01**	**-2.26**	0.00	-0.87	-0.01	-1.89	**-0.02**	**-3.22**
Intercept	0.01	1.48	0.00	0.04	**0.03**	**3.42**	**0.04**	**6.15**	**0.05**	**5.10**	**0.06**	**5.45**	**0.10**	**17.59**	**0.03**	**6.39**	**0.45**	**27.42**	**0.23**	**19.42**

Bold: Significant at the 95% level.
Omitted categories age less than 25, white, income less than $25,000, high school education or less.

Table 8 shows the error covariances between equations. In this case these covariances represent preferences between events holding total attendance constant. Here we find a much more interesting pattern of covariances. Within the art group the covariances are positive. This is the strongest evidence that preferences for arts attendance at different event types are positively correlated. In contrast, the negative correlations with other types of events indicate that they are substitutes in preference. This is the strongest evidence we find that arts and non-art events compete for audience. Having said this there is not a particularly strong relationship between sports and art. The biggest negative correlation with professional and amateur sport is movies. Movies also have the largest negative correlations with art events, as well as with popular events.

Table 8:
Error Covariances from Attendance Share Regressions

	Prof. Sports	Am. Sports	Orchestra	Theatre	Dance	Opera	Comedy	Rock	Club	Movies
Professional Sports	**1.00**									
Amateur Sports	**-0.02**	**1.00**								
Orchestra	**-0.09**	**-0.10**	**1.00**							
Theatre	**-0.14**	**-0.16**	**0.03**	**1.00**						
Dance	**-0.11**	**-0.11**	**0.05**	**0.13**	**1.00**					
Opera	**-0.06**	-0.06	**0.09**	**0.04**	**0.05**	**1.00**				
Comedy	**-0.04**	**-0.07**	**-0.04**	**0.02**	**-0.01**	**-0.01**	**1.00**			
Rock Concert	**-0.09**	**-0.11**	**-0.03**	**-0.05**	**-0.05**	**-0.03**	**-0.02**	**1.00**		
Club	**-0.17**	**-0.17**	**-0.09**	**-0.14**	**-0.09**	**-0.05**	**-0.04**	**0.01**	**1.00**	
Movies	**-0.30**	**-0.33**	**-0.15**	**-0.21**	**-0.21**	**-0.10**	**-0.12**	**-0.17**	**-0.36**	**1.00**

Bold: Indicates significant at the 95% level.

Conclusion

In this paper we have examined the audience characteristics and attendance behavior for 10 types of sports, arts, and non-art events. We find that while there are significant differences in the audience make up and demographic effects on attendance for different events, there is little evidence that arts and sports compete for audience. In several of the tests we conduct we find that individuals who attend sports are more likely to attend art events. However we do find in a model that holds total event attendance constant there are complimentary preferences among art events while other events are substitutes in preference for the arts. A notable finding is that while sports do compete with art events for attendance shares, by far the largest competitor for these shares is movies. In fact movies are the most important competitor with all events types.

Notes

[1] It is hard at this point not to recall an October visit to the Hartford Opera. During the intermission it appeared as though one of the main audience activities was calling friends to get an update on the Yankees-Red Sox American League Championship score.

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