Chapter 14

EMPIRICAL STUDIES OF DEMAND FOR THE PERFORMING ARTS*

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* This chapter is an abbreviated version of the full review of the performing arts demand literature, Seaman (2005), appearing in the Nonprofit Studies Program Working Papers series (NP05-03) of the Andrew Young School of Policy Studies, Georgia State University. This paper can be found at http://aysps.gsu.edu/nonprofit/working/nspwp0503.pdf.
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Abstract

While audience and participation surveys, as well as econometric demand studies, generally confirm that performing arts audiences are relatively elite, there are surprises. Education (despite conflicting causal interpretations) is a stronger determinant than income, but that evidence is more reliable from survey results than from econometric estimation, and arts training is often distinguished from formal education. The arts as luxury goods can only be confirmed by those rare studies controlling for the value of time, and price elasticities are often higher than expected, especially when more disaggregated data are examined. Price inelastic demand is more likely the result of low pricing strategies of non-profit arts managements rather than any inherent result of an acquired taste for the arts, while cross-price elasticity evidence is relatively weak, even within the performing arts. Arts demand cannot adequately be estimated without also considering “life-style” variables, or non-standard socioeconomic factors such as sexual orientation, gender and socialization processes, and even the role of age has been notably complex. Quality of arts performance or organization seems important, but the econometric results are mixed. Habit formation must be distinguished from learning-by-consuming and rational addiction in examining dynamic determinants. Sociologists, psychologists, and marketing specialists, as well as economists, have contributed to this literature, which remains unusually enigmatic despite about forty years of increasingly sophisticated analysis.

Keywords

demand, elasticity, performing arts, pricing, product quality, firm versus industry, habit formation, learning-by-consuming, rational addiction

JEL classification: C1, C2, C3, D12, D13, L82, Z1
1. Introduction

When readers of *La Scena Musicale* in December 2001 were informed that “… the likelihood of money being spent on orchestral music is linked to consumers’ increasing age, education and income” [Ehrensaft (2001, p. 1)] they could hardly have been shocked. The “high arts” are widely viewed as the domain of a minority of elites, long an argument used by opponents of government arts subsidization to characterize such support as regressive, and ironically also by proponents who stress the need to make culture more accessible to the general public. Furthermore, one might suspect that this consensus and conventional wisdom would render efforts to conduct empirical studies of the demand for the arts relatively useless – at best, carefully designed confirmations of the obvious.

This chapter is designed to evaluate that suspicion, and finds surprising evidence of contradictory results, personally held convictions that are inconsistent with the empirical evidence, and significant popular misconceptions about the findings in some of the most cited empirical studies. Lévy-Garboua and Montmarquette, themselves significant contributors to this literature, reflect this best when they observe: “It is likely that the demand for the arts is price-elastic and art is a luxury good. But this prediction stems more, as yet, from a theoretical conjecture than from well-replicated empirical estimates” (2003, p. 211). They also suggest that we have not yet clarified whether arts goods have close substitutes, hence suggesting that we are still “groping towards firm answers” to three of the most basic empirical questions regarding arts demand (2003, p. 201).

Corning and Levy (2002, p. 218) observe that “studies of demand for the performing arts typically take one of two basic approaches: survey studies which seek to characterize the demographics of theater [and other] patrons, and econometric studies which seek to quantify demand and income elasticities”, although it is notable that data for econometric studies are often derived, at least in part, from either audience or arts participation surveys.2

Regarding econometric studies, while “income and price elasticities … are the usual end-products of empirical demand analysis” [Barten (1992, p. 21)], a substantial portion of the performing arts demand literature does not derive such elasticities. For example, only 29 of the 44 regression-based studies cited in this chapter report some kind of demand elasticities; of these only 19 estimate both own-price and income elasticities, and fewer still also estimate any cross-price elasticities.3 Thus, a notable part of this litera-

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1 Although they might have been surprised by the optimistic tone of the article, which cited demographer David Foote as demonstrating that “aging baby boomers” and the “graying of classical music audiences” will be a “valuable asset” that will ultimately lead to an increase in the classical music market [Ehrensaft (2001, p. 1)].

2 For a good roundtable discussion of the difficulties in accurately conducting such surveys, see Horowitz (1985). Audience surveys are typically based on distributing questionnaires to audiences and collecting them upon departure, while participation surveys are designed to randomly sample the broader population, not limited to those who have been “self-selected” as part of an arts audiences.

3 See further in Table 1.
ture is devoted instead to more broadly examining the competing determinants of arts attendance or participation patterns without any formal link to the neoclassical theory of consumer behavior and its related concerns with formal homogeneity or aggregation constraints.4

This chapter is a much shortened adaptation of Seaman (2005), focusing on the econometric literature and also briefly summarizing the results of the survey studies. The arts are defined primarily as the non-profit performing arts (orchestral and chamber music, opera, ballet and modern dance, and theater, but also including for-profit Broadway), although comparisons are made with museums and the largely for-profit media arts and other forms of recreation and entertainment, including sports.

The organization is as follows. Section 2 briefly describes performing arts audiences based on participation and audience surveys. Section 3 provides an overview of the econometric literature, while Section 4 reports on the estimation of price and income elasticities, focusing on the effects that different levels of aggregation and audience segmentation have on the empirical results. The technical challenges that have faced researchers in conducting empirical arts demand studies are addressed in Sections 5–9, while Section 10 evaluates the view held by some that “life-style” and various socialization measures are more important determinants of variation in arts consumption behavior than are the traditional socioeconomic determinants of age, income, education and occupation. “Mixed” factors such as gender, race and ethnicity, religious affiliation, and sexual orientation combine with other variables to complicate that analysis. Section 11 summarizes the data problems that have plagued economists in addressing the issues discussed in the previous sections. A concluding summary and evaluation (Section 12) focuses on an assessment of the claim that three main developments are required before more definitive answers can be given to questions about the demand for the arts:

1. more careful econometric work;
2. the increased use of large data sets; and
3. the “more intensive use of explicit models of the cultivation of taste” [Lévy-Garboua and Montmarquette (2003, p. 211)].

4 Even studies that estimate demand elasticities are faced with sufficient data and econometric challenges such that few can afford the luxury of ensuring that estimated demand functions are homogeneous of degree zero while also meeting Engel and Cournot aggregation conditions. Pommerehne and Kirchgassner (1987) is a rare example of using almost-ideal-demand-system restrictions to estimate expenditure shares for cinema, theater and a composite good. The general absence of such restrictions can indeed complicate the interpretation of the results, especially regarding the controversial issue of price elasticities. However, many of the conclusions regarding other important issues are relatively unaffected by statistical technique (e.g., discriminant, cluster, factor or multivariate regressions) or by field of specialization (e.g., economics, sociology, arts policy, psychology, or marketing).
2. What do we know about arts audiences?

2.1. Audience profiles

Two of the earliest empirical observations in arts economics are, first, that performing arts audiences are elite in terms of income, education and profession and hence non-representative of the more general population, and second, there are only trivial differences in those audience characteristics across the various performing arts forms.\(^5\) In fact, that “audiences from art form to art form are very similar” was viewed by Baumol and Bowen as “the most remarkable finding” of their path-breaking efforts to assemble credible data on arts consumption patterns, primarily in the United States (1966, p. 84).

Throsby and Withers (1979), evaluating 1976 Australian data, found essential similarity between Australian and American audiences, and also cited British and Canadian data. A more recent Canadian survey of theater patrons in Montreal found ongoing evidence of this elitism in that 54 percent were university graduates, 45 percent earned more than $40,000 per year, and only 11 percent were employed in primary (manufacturing or construction) industries [Colbert and Nantel (1989)]. The most detailed ongoing source of survey data on performing arts audiences is the Survey of Public Participation in the Arts (SPPA), periodically published by the US National Endowment for the Arts. The most recent version applies to 2002 [National Endowment for the Arts (2004)], and continues to generally support the arts elitism hypothesis. These data have also served as the foundation for regression-based studies such as Peterson, Hull and Kern (2000) and Gray (2003).

Actually, the commonality of arts consumption patterns across many different countries, educational systems and cultures was not a universally anticipated result, as Baumol and Bowen discovered when they were told by British colleagues to anticipate much more egalitarian results in extending their survey to Great Britain [Baumol and Bowen (1966, p. 89)]. However, except for a slightly higher representation of lower middle-income groups in British audiences (p. 93), Baumol and Bowen found “remarkable” similarity in the British and American results (p. 89). Interestingly, Cwi (1985) attacked the Baumol and Bowen (1966) conclusion about arts audience elitism as fostering a “welfare economics mentality towards arts policy” that primarily serves the interests of a political agenda to justify government subsidies to bring “arts to the people” (p. 32). Cwi further argued (1985) that even if the basic audience profile were to remain relatively constant, substantial societal changes in education and occupational choice would progressively make that profile more reflective of the general population, and that the elitism of arts audiences had always been in part the result of an overly narrow definition of the arts. The evidence regarding whether the arts are becoming less elitist is decidedly mixed. For example, O’Hagan (1996) found absolutely no evidence

\(^5\) Baumol and Bowen (1966); Ford Foundation (1974); Book and Globerman (1975); National Research Center of the Arts, Inc. (1976); DiMaggio and Useem (1978); Throsby and Withers (1979); West (1985).
in Irish, British and American data of any change in the access of the performing arts to a wider audience, while Heilbrun (1996), using a different measurement standard, found notable improvements in the accessibility of the arts to the general population between 1980 and 1990 in the United States.  

2.2. Age

Age represented the most unexpected results in the Baumol and Bowen (1966) audience survey, with those aged 20–24 the most over-represented in both American and British arts audience relative to the size of that age group in the general population, when attendance is imperfectly defined as “having attended at least one performance within the past year”. These “relative frequencies” decline systematically with age, indicating that performing arts audiences were dramatically younger than the general urban populations in both countries in the mid-1960s. However, when frequency of annual attendance is considered, the role of age in arts audiences changes. For those attending more than 10 times per year, 7.1 percent were over 60 years old compared to 2.4 percent under age 20 for Broadway Theater, with the “older age gap” a very high 17.9 percent vs. 3.9 percent for Major Orchestras, and a more moderate 7.0 percent to 5.8 percent for Regional Theater [Baumol and Bowen (1966, Appendix, Table IV-I)]. The most recent SPPA [National Endowment for the Arts (2004)] also reflects an ongoing aging of arts audiences, even though managements of many arts organizations have objected to this conclusion [Peterson, Hull and Kern (2000, p. 1)].

Japanese and German data from the early 1980s and mid-1990s reflect the surprising complexity of the role of age in performing arts audiences. Although the context of analyzing Japanese audiences regarding western classical music may influence the comparability of such results with western audiences, the Kurabayashi and Ito (1992) survey results are striking. With the sole exception of a notable trend toward older audiences for the NHK Symphony Orchestra between 1977 and 1981, these results indicate a remarkable bias toward younger audiences, especially for the Osaka Philharmonic, where fully 68.9 percent of females in the audience were younger than 30. In fact, more than 50 percent of each gender was younger than 30 for all non-NHK cases except for males attending the Tokyo Philharmonic and the Sapporo Symphony, and even in those cases the young group outweighed the older group.

Would anything approximating this youth bias be found in countries at the heart of western classical music such as Germany, where classical music is typically referred to as ernste or “E-Musik”, in contrast to less culturally “rich” popular or “U-Musik”? Wiesand (1995, Table 2) provides evidence of notable differences in the propensity of different age groups to consume four different types of concerts (music theater, E-concerts, U-concerts, and rock/jazz), but except for the strong youth bias for rock/jazz music, his findings show relatively similar consumption patterns among the youngest audience members.
age group (18–24) across the three other music types. The next youngest group (25–34) shows more variation, but has the highest propensity to experience “E-Konzerte”. The Wiesand data confirms the expected result that the youngest German age group has the highest overall participation rate in attending concerts and that the most “high-brow” music (E-concerts) is the least popular. The youngest group (18–24) is also notable for having relatively similar participation rates for all three non-Rock and Jazz music types (although lowest for the classical type E-music). The most significant result is that the second youngest age group (25–34) has the highest classical music participation rate, and the combined participation rates of the youngest groups (younger than 35) are higher than the comparable rates for the two oldest age groups (older than 50). Thus, the German evidence is also consistent with the earlier results that, at least when frequency of attendance is ignored, the performing arts should not automatically be thought of as dominated by older age groups.\(^7\)

2.3. Education and income

Arts survey studies such as the National Research Center of the Arts, Inc. (1976), which served as the key data source for DiMaggio and Useem (1978) and the Ford Foundation (1974, Vol. II), have also contributed substantially to our understanding of the relative roles of education and income in determining performing arts attendance. While the positive causal relationship between education and income has plagued econometric efforts to separate their independent effects,\(^8\) the early non-econometric literature was replete with evidence that the role of education was much stronger than that of income.\(^9\) In fact, Heilbrun and Gray (2001) identify the Ford Foundation (1974, Vol. II) study as important evidence of the relative effects of education versus income, but also citing Gray (1998) as providing multivariate regression evidence supportive of a larger role for education than income, based on an analysis of 1997 SPPA data (Tables A17, A20 and A21).\(^{10}\) The later National Endowment for the Arts 2002 SPPA survey [National

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7 This point is also consistent with the West (1985) Ontario, Canada audience survey finding that the same percentage of arts audience (20.1 percent) were 20–30 years old as were 40–50 years old, and those older than 50 constituted only a trivially higher 20.9 percent of audiences. The dominant age group was 30–40 (29.6 percent). He did confirm, however, the frequent finding that the under 20 age group was dramatically under-represented at only 2.6 percent of Ontario audiences in 1984–1985.

8 See further in Section 6.

9 Globerman (1989) also cites other US data from the Association of College, University and Community Arts Administrators, Inc. (1984–1985) as providing at least “suggestive” evidence that education is more important than income and occupation in determining arts attendance.

10 Researchers who are selectively familiar with only the econometric literature seem especially prone to concluding that there is no coherent evidence of the separate roles played by these two strongly positively correlated variables. This conclusion has no doubt been reinforced by the fact that two of the best early econometric studies that did indeed confirm a relatively weak role for income, did not include education as a separate independent variable in their equations [Moore (1966); Withers (1980); with additional results also reported in Throsby and Withers (1979)], and the fact that an early study that did include both independent
Endowment for the Arts (2004)] continued to report that education, “more than any other demographic factor” is highly correlated with attendance at arts events and museums (p. 19). However, of more relevance to the issue of whether regression analysis has confirmed this result is the NEA sponsored study by Peterson, Hull and Kern (2000), which generally (but not universally) reported that education is the strongest predictor of arts attendance using data from the 1997 SPPA survey and basic OLS estimation.

DiMaggio and Useem (1978, Table 1) stressed the so-called education gap and the income gap in the self-reported “exposure” of various types of individuals to seven different “cultural forms”. For example, an education gap of 55 (percent) was reported for exposure to theater because the exposure rate of the most educated group (college graduates) was 73 percent while the exposure rate for the least educated group (< high school graduate) was only 18 percent (an absolute difference of 55 percent). Each “consumption gap” entry reported by DiMaggio and Useem (1978) reflected this absolute difference between the exposure rates of the most versus least educated, or the highest versus lowest income group. The most critical feature of these consumption gap data was the sizeable education gap for all seven cultural forms, even including popular music. The three high arts forms showed the greatest education gap, a result not duplicated by the income gap, which displayed the unexpected pattern of being lowest for arguably the most elitist art form (classical music), and almost as high for the more popularized cinema as it was for art museums and theaters.

However, the Ford Foundation study (especially Table 15) has been the most influential in confirming that “to a startling degree . . . it is indeed education rather than income that matters most” [Ford Foundation (1974, II, p. 16)]. For example, using theater attendance as an example, when income was held constant at either a high or low level, differences in education generated either a 21 percent differential in attendance rates (for high income), or a 25 percent differential in attendance (for low income). However, when this was reversed, and education was held constant at either a high or a low level, differences in income had much smaller effects – an attendance rate differential of only 8 percent for those with high education, and a 12 percent differential for those with low education. This pattern was also evident for symphony, opera and ballet. While much weaker, this apparent relative potency of educational differences in affecting attendance rates even extended to popular Broadway musicals, and the more contemporary music forms of jazz, rock and folk. By this measure, education only failed as the stronger factor compared to income in the case of movies, where their average “explanatory power” was equal.

We return to the question of education vs. income in our discussion of the results of econometric studies in Section 6 below.11

variables [Gruenberg (1975); see text below] was unpublished. Furthermore, similar to the case with Gray (1998), three other studies documenting some econometric support for the strength of education over income are relatively unknown [Gapinski (1981); Goudriaan and de Kam (1983); Ganzeboom (1989)].

11 Other issues regarding arts audiences are discussed in Seaman (2005), including: the question of overlapping performing arts audiences (“co-patronage”); the debate regarding possible arts booms and how such
3. An overview of econometric performing arts demand studies

Since 1966 there have been at least 44 econometric studies of the demand for (or consumer participation in) the performing arts.12 A few of these studies also included specific numerical estimates of other demand elasticities: cross price [Withers (1980); Throsby and Withers (1979); Touchstone (1980); Gapinski (1986); Bonato, Gagliardi and Gorelli (1990)]; leisure price [Withers (1980); Throsby and Withers (1979)]; donor price [Lange and Luksetich (1984)]; tourism attendance [Gapinski (1988)]; education [Globerman and Book (1977); Gapinski (1981)]; advertising [Luksetich and Lange (1995)]; “number of shows” [Moore (1966)]; and even “unpopularity of conductor” [Greckel and Felton (1987)]. Other studies derived coefficient estimates that were not translatable into elasticities, and/or evaluated a large number of additional independent variables, many of which lacked either economic or statistical significance.

Basic linear ordinary least squares (OLS), especially using the double-log form, has been the most popular primary estimation technique (used in 18 studies), but other related techniques have been used including: step-wise OLS [Globerman and Book (1977); Greckel and Felton (1987); Andreasen and Belk (1980)]; double-log weighted OLS [Felton (1992)]; two-stage least squares [Moore (1966), Lange and Luksetich (1984), Luksetich and Lange (1995), Jenkins and Austen-Smith (1987)]; conditional maximum likelihood estimation [Corning and Levy (2002)]; the almost ideal demand system [Pommerehne and Kirchgassner (1987)], Clawson–Knetsch distance modeling [Forrest, Grimes and Woods (2000)]; non-parametric linear regression [Schimmelpfennig (1997)]; and logit, tobit, or probit non-parametric estimation (eight studies).13

Of the 44 econometric studies, 22 relied upon US data. Approximately two-thirds of all studies reported time-series results (including some pooling of time series and cross-section data), but since a few of those studies also included separate cross-section analysis [Moore (1966); Goudriaan and de Kam (1983); Luksetich and Lange (1995)] about 42 percent of all studies involved cross-section estimation. Only nine demand dynamic changes might affect the degree of audience elitism [DiMaggio and Mukhtar (2004)]; and the emerging marketing literature regarding “omnivores” (i.e., those whose music and leisure consumption is so broad and eclectic as to defy the label elitist) and “univores” (by contrast, persons with decidedly narrower favorites among music and other leisure options) as considered by Peterson (1992), Bryson (1997), van Eijck (2000), Fisher and Preece (2002, 2003), and Lopéz Sintas and García Álvarez (2004).

12 Seaman (2005) further clarifies which types of studies are omitted. For example, highly specialized marketing forecasting models such as Weinberg and Shachmut (1978), whose “ARTS PLAN” model inspired some similar efforts to predict attendance at specific (usually university) performing arts events are omitted. See also Weinberg (1986) and Putler and Lele (2003).

13 This choice of approaches is in no way at odds with standard practice in empirical economics. DiNardo and Tobias (2001) begin their overview of non-parametric techniques by observing: “Even a cursory look at the empirical literature in most fields of economics reveals that a majority of applications use simple parametric approaches such as ordinary least squares or two-stage least squares accompanied by simple descriptive statistics” (p. 11).
studies constituted essentially a case study of one or two specific arts firms, with the rest involving some degree of aggregation among many organizations, with seven reporting results for some version of the aggregate performing arts [although three of these also reported less aggregated results for separate art forms: Houthakker and Taylor (1970), Throsby and Withers (1979), Pommerehne and Kirchgassner (1987)]. The most popular separate art form aggregation has been theater (including a few studies of the for-profit Broadway theater), identified in 20 studies, followed by symphony orchestras, which were the primary or secondary focus of 16 studies. Separate results were reported for aggregated opera companies eight times and for dance/ballet companies seven times.

Owing to the important role played by the concepts of own price and income elasticity of demand in economic analysis generally and in discussions of the demand for the arts in particular, the next section focuses on those studies that have estimated such elasticities.

4. Price and income elasticities

Table 1 more fully documents the 29 studies that have reported either own price or income elasticities, or both. Note that the table omits any regression study that does not derive elasticities, even if it includes income and/or price as variables.

A review of Table 1 confirms that the Lévy-Garboua and Montmarquette suspicion that the arts really are luxury goods with own-price elastic demands (2003, p. 211) has not yet been justified by the econometric evidence. Regarding estimates of the own-price elasticity of demand, 12 studies found that the demand for the arts is price inelastic while only four found strong evidence of price elastic demand. Krebs and Pommerehne (1995) reported low short-run but high long-run price elasticity. However, five other studies found mixed results for the price elasticity of demand, especially when data allowed a more disaggregated analysis of different price ranges, audience characteristics, or type and sizes of individual arts organizations.

Let us consider the differences among these results in more detail.

4.1. Price elasticity differences by level of aggregation

In interpreting the price elasticity results reported in Table 1, we can observe that, regardless of technical sophistication, the price inelasticity result is much more prominent in those studies that used very aggregative data across all performing arts groups in contrast to studying individual arts organizations, and/or that used a measure of ticket price (such as total revenue divided by attendance) that does not measure the actual

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14 Of course, this aggregation problem is hardly confined to the arts. The common estimation of supply and demand functions “using uniform prices and quantities across products, yielding a single industry-wide demand elasticity estimate” is criticized in a study of the personal computer market as especially misleading when firms produce differentiated rather than homogeneous goods, since “each product is likely to face
### Table 1
Summary of performing arts own price and income elasticity estimates: sorted by year

<table>
<thead>
<tr>
<th>Study</th>
<th>Price</th>
<th>Income</th>
<th>Study</th>
<th>Price</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moore (1966)</td>
<td>−0.33 to −0.63</td>
<td>0.35 to 0.43; 1.03 cross-sect.</td>
<td>Carson and Mobilia (1989)</td>
<td>−0.38</td>
<td>−4.74 to 5.78</td>
</tr>
<tr>
<td>Moore (1968)</td>
<td>−0.18 short; 0.74 short;</td>
<td>1.26 long run</td>
<td>Bonato, Gagliardi and Gorelli (1990)</td>
<td>−0.38</td>
<td>0.78</td>
</tr>
<tr>
<td>Taylor (1970)</td>
<td>−0.31 long</td>
<td>None</td>
<td>Throsby (1990)</td>
<td>−0.41 (not sig.)</td>
<td>None</td>
</tr>
<tr>
<td>Globerman and Book (1977)</td>
<td>None</td>
<td>0.76 to 1.07 by art form</td>
<td>Prior month</td>
<td>−</td>
<td>seasonally</td>
</tr>
<tr>
<td>Withers (1980)</td>
<td>−0.90 to −1.9;</td>
<td>0.64 to 1.55</td>
<td>Oteri and Trimarchi (1990)</td>
<td>Not statistically significant</td>
<td>Not statistically significant</td>
</tr>
<tr>
<td>Throsby and Withers (1979)</td>
<td>−0.62 to −0.67</td>
<td>1.43 to 2.78</td>
<td>adjusted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA data</td>
<td>−0.62 to −1.0 conventional</td>
<td>Not significant in either model</td>
<td>Felton (1992)</td>
<td>−0.13 to −0.95 by art form and size</td>
<td>0.77 to 3.09 varies by art form and size</td>
</tr>
<tr>
<td>Australia data</td>
<td>−0.61 to −1.17</td>
<td>None</td>
<td>Abbé-Decarroux (1994)</td>
<td>−0.31 full price (insig.); −2.45 low price not sig. diff. −1.0</td>
<td>None</td>
</tr>
<tr>
<td>Touchstone (1980)</td>
<td>Imputed: −0.09 to −0.13</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gouudriaan and de Kam (1983)</td>
<td>None</td>
<td>0.10 to 1.02 by art form</td>
<td>Luksetich and Lange (1995)</td>
<td>−0.16 to −0.42 by orch. size</td>
<td>Not significant</td>
</tr>
<tr>
<td>Gapinski (1984)</td>
<td>−0.66</td>
<td>1.33</td>
<td>Krebs and Pommerehne (1995)</td>
<td>−0.16 short; −2.6 long</td>
<td>0.1 not stat.</td>
</tr>
<tr>
<td>Lange and Luksetich (1984)</td>
<td>−0.49 to −1.26 by orch. size</td>
<td>None</td>
<td>Lévy-Garboua and Montmarquette (1996)</td>
<td>−1.00 to −1.47 by experience</td>
<td>None; wealth proxies +</td>
</tr>
<tr>
<td>Gapinski (1986)</td>
<td>−0.07 to −0.29 by art form</td>
<td>0.06 to 0.27 by art form</td>
<td>Schimmelpfennig (1997)</td>
<td>−1.34 to −5.56 by ballet, seats</td>
<td>None</td>
</tr>
<tr>
<td>Pommerehne and Kirchgasner (1987)</td>
<td>−1.22 to −1.65 by income</td>
<td>1.50 (not sig.) to 2.44 by income</td>
<td>Ekelund and Ritenour (1999)</td>
<td>Inelastic (no numerical)</td>
<td>0.78 normalize</td>
</tr>
<tr>
<td>Jenkins and Austen-Smith (1987)</td>
<td>+1.1 to +2.5</td>
<td>0.26 to 0.54 insignificant</td>
<td>Forrest, Grimes and Woods (2000)</td>
<td>−1.24 point</td>
<td>None</td>
</tr>
<tr>
<td>Greckel and Felton (1987)</td>
<td>−0.34 to −2.33 insig. by art org.</td>
<td>2.26 insig. to 6.13 by org.</td>
<td>Comming and Levy (2002)</td>
<td>−0.05 to −4.87 by venue</td>
<td>1 of 3 &gt; 1.0; 3 &gt; 0 but only 2 sig.</td>
</tr>
<tr>
<td>Felton (1989)</td>
<td>−0.64 to −1.62 opera</td>
<td>None significant</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: “None” indicates that no elasticities were estimated, due largely to an absence of data.
prices paid by different types of consumers. Notably, Jenkins and Austen-Smith (1987), one of a few studies to find statistically significant but positive own-price elasticities, explained the paradox of that finding in part by suggesting that price is serving as a proxy for quality, but also implicating their overly aggregated measure of price (i.e. an average of total box office revenues over the entire season divided by total season attendance; p. 170).15

Given the expected importance of having more disaggregated and targeted price data, what can be said about the results of studies that segmented the audience more carefully, or that focused on less aggregated measures of the performing arts? Caution is essential in making any generalizations about this literature. For example, Moore (1966) found consistently low own-price elasticities for Broadway theater tickets even when studying a relatively disaggregated segment of the performing arts (aggregated to be sure across seven Broadway houses and 18 performances, but at least not focusing on the overall performing arts). His somewhat unconventional use of a list price (i.e. “an average of the cost of the most expensive seats for a regular performance of each production”; p. 83) to proxy average price paid can be criticized, but may not have seriously biased his time-series results. And Gapinski (1986) is widely lauded for deriving separate theater, opera, symphony and dance estimates of cross-price as well as own-price elasticities using quite disaggregated data specific to thirteen individual arts companies in London. Yet he found generally low own-price elasticities for each of the individual organizations (varying from −0.05 to −0.70). However, in constructing his nominal price variables Gapinski was forced to resort to dividing attendance into box office revenues (including value-added tax), hence failing to fully capture actual transaction prices or to differentiate among consumer groups.

Less aggregated studies generally segmented audiences in various important ways that allow for a more precise examination of pricing, as well as other likely demand determining characteristics. Pommerehne and Kirchgassner (1987) segmented by income of consumers, with price elasticity lower for high-income than for average-income consumers (but with both being greater than one in absolute value); they also found uncommonly low own-price elasticities for cinema. Seating section was the key for Schimmelpfenning’s ballet study (1997), which found generally elastic demand for Orchestra, Grand Tier, and Rear Amphitheater sections, with surprisingly high price elasticities even for the more expensive Orchestra seats that supposedly serve higher-income patrons. By contrast, the Abbé-Decarroux (1994) results for a Geneva theater were more expected, with a finding of a high price elasticity of −2.45 for his “reduced price” consumer group (although not clearly statistically different from 1.0 at the 0.05 level), but inelastic (and not statistically significant) price elasticity for the “full price” group. He

a different demand elasticity”, ideally requiring a focus on “individual products’ attributes and their market position” in estimating demand elasticity [Stavins (1997, pp. 347–348)]. For a comprehensive review of heterogeneity and aggregation problems in economics, see Blundell and Stoker (2005), with applications to demand modeling (pp. 350–364).

15 Seaman (2005) provides a detailed analysis of the various ways to measure price (Part 3.1.1).
was also unique in explicitly arguing that such results “weaken” the conclusions of other major studies that use an overly aggregated average price to derive price-inelastic results for the performing arts (p. 105).  

Felton's (1994/1995) study of 25 large US orchestras found lower price elasticity for subscribers (−0.24) compared to price elasticity for the combined “total attendance” (although still less than unity at −0.85). However, that result contrasted with her pooled time-series study of 13 opera companies [Felton (1989)], where subscribers appeared more responsive to ticket-price changes than single-ticket purchasers (i.e. her only statistically significant results were for subscribers, although the magnitude of the price elasticities varied widely across organizations). Even though subscriber reactions to ticket price changes differed somewhat between her 1994/1995 orchestra and 1989 opera samples, she decided to limit her 1992 study of orchestra, opera and ballet companies to subscriber demand, basing this decision on her conclusion that her previous work with opera data had revealed “that season subscribers do react to ticket price changes while non-subscribers do not” [Felton (1992, p. 2)].

Lévy-Garboua and Montmarquette (1996) imputed rather than directly estimated price elasticities (see Section 7 below) but derived the surprising result that more experienced French theater-goers actually had higher price elasticity of demand (−1.47) compared to those less experienced (price elasticity close to unity), inconsistent with the view that price elasticity will be low for an acquired taste like the arts.  

Segmenting by organization location has also generated differing own-price elasticities, with Corning and Levy (2002) finding that a three-location Southern California theater group faced price elasticities varying from inelastic to elastic depending on the specific venue. Lange and Luksetich (1984) found higher own-price elasticities for smaller orchestras than for large budget major orchestras, but their 1995 simultaneous

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16 Throsby (1990) found supporting evidence in his equations estimating the consumer “valuation” of a play. These utility function estimations revealed that the strongest influence of price was on the mainly young and less affluent audience of one of his Sydney theaters, whereas his least price-sensitive group was the audience of the most conservative of his theaters (p. 79). Huntington (1991) showed a kinked demand curve based on different price points. Kirchberg (1988) found that low-income groups regarded museum entrance fees as a barrier five times as often as do those in higher income groups with education, occupation, and “lifestyle” variables further broadening this gap.

17 Doubtless the most novel interpretation linked to this finding is that of Köster and Marco-Serrano (2000, p. 8, Footnote 7), who cite Lévy-Garboua and Montmarquette (1996) for the finding that “the satisfaction degree is bigger among the occasional attenders than in the frequent attenders”, suggesting to them that the satisfaction of the occasional attenders stems more from the “sensation of having completed a duty” than from any direct arts consumption “sensorial rewards”.

18 Ulibarri (2005) lends further theoretical support to the idea that more experienced arts consumers should have lower price elasticities in his application of an adaptive utility choice model the arts, lending further support to the notion that markets for arts goods will be segmented (p. 140).
equation orchestra model (where they also incorporated interactions with donations) found generally low price elasticities regardless of organization size (see Section 5 below).

Thus, while it can be said that own-price elasticities estimated with more disaggregated data are more likely to be greater than one in absolute value (whereas with aggregated data they almost never are), the extent and significance of those findings have sometimes been overstated. For example, Felton (1992) is regularly cited for finding low price elasticities of demand for aggregated groups of arts organizations, but significantly higher price elasticities for individual arts organizations within those groups [e.g., Throsby (1994, p. 8)]; however, she actually found price elastic demand in only 21 percent of her orchestra sample, 7 percent of her ballet sample, and 16 percent of her opera sample. Furthermore, while that paper is sometimes portrayed as distinguishing between industry and firm price elasticities, her pooled data did not include multiple companies in any one artform in any one city, and in some cases did not even have more than one company of any artform in any one city. So Felton (1992) is not really a study well-designed to distinguish market or industry price elasticities from firm price elasticities. Furthermore, Felton’s earlier study of individual opera companies (1989) reported only three opera companies with statistically significant subscriber own-price elasticities, with one being elastic (San Francisco), one unity (San Diego), and one inelastic (Houston). So there is no unambiguous finding of price elasticity greater than one even when the focus is on individual organizations.

4.2. Conceptual issues in interpreting the price elasticity results

Regardless of how the empirical price elasticity results vary by level of aggregation or with the sophistication and “accuracy” of econometric technique, it is surprising how little attention has been paid to interpreting these results in light of economic theory. For example, little focus has been directed to the standard argument that non-profit arts organizations often charge lower than revenue-maximizing ticket prices. In a related literature, it has been explicitly argued that profit-maximizing sports teams strategically under-price tickets; such non-revenue-maximizing behavior has become a standard explanation for the low price elasticities frequently found in empirical studies of sports

19 Admittedly not possible to do if there is only one local professional opera company or even orchestra; Gapinski (1986) is a notable exception.

20 Of course, the convenient and very commonly used double-log linear equation specification generates constant elasticities that do not vary with price, in contrast to a cubic log equation that can generate price elasticities that vary with prices [for an example in sports, see García and Rodríguez (2002)]. If the range and level of available performing arts price data is “artificially low” due to either non-optimal pricing, or systematic efforts to make the arts “more accessible”, perhaps not just as a public service but as part of a longer run strategy of encouraging people (especially the young) to develop the kind of human capital that can lead to various forms of consumption addiction, we would naturally expect to find relatively low estimated constant price elasticities.
demand. In fact, sports economists have generally refused to accept any empirical evidence of price-inelastic demand. Even when there is dissent, the issue of the price level at which price elasticity is estimated remains critical. For example, Coates and Harrison (2005) express amazement at their finding that the demand for baseball attendance in the US is strongly price inelastic. They argue that the significant local market power of all baseball franchises should induce them to “operate on the elastic portion of the demand curve”, and consider the quest for an explanation for why teams are operating in the inelastic portion of their demand curve “an important question for future research” (p. 298).

By stark contrast, the most common reaction among arts economists has been to find econometric evidence for low price elasticities to be consistent with theoretical expectations and non-econometric survey evidence. For example, Throsby (1994) repeats his earlier distinction between “immediately accessible” popular entertainments and the higher arts that reflect an acquired taste, in defending his view that the arts will have lower price elasticities among established consumers “for whom qualitative characteristics of performances are likely to be decisive” (pp. 3 and 7–8). While this argument seems consistent with a view that demand for the lively arts is “inherently” price insensitive, it is important to note the Throsby reference to “established” consumers rather than all consumers.

In defense of an “inherently” low price elasticity of demand for the arts, it is universally recognized that ticket price is only one component of the explicit expense of attending a live performance, and an even smaller share of the total expense when the implicit opportunity cost of time is included in the “full price”. Furthermore,
viewing consumers as producers would distinguish between purchasing a ticket for a performance (a market good serving as a productive input) and actually consuming the individually-produced “art appreciation”. Once that fundamental distinction is made, there is no theoretical inconsistency between finding a “shadow price-elastic demand for art appreciation” and a “market price-inelastic demand for art consumption” as revealed in ticket price data.²⁶

Another aspect of the full price of arts consumption that can reduce the economic significance of the explicit admission price is the interaction between admission expenses and voluntary donations. The potential for price discrimination strategies in the arts is further enhanced by their non-profit status that encourages donations. As argued by Lange and Luksetich (1984), the total price of attending a symphony concert includes both the price of the ticket and any contributions of that patron to the orchestra.

Finally, it is useful to remember the textbook list of factors determining price elasticity variations across different products (always measured for the industry or market, and not for the individual firm or consumer):

- substitution possibilities;
- budget share;
- direction of income effect; and
- time.

Frank (2006) presents a comparison of empirically estimated price elasticities of demand for seven very aggregated product groupings ranging from “green peas” (elasticity of −2.8) to “theater, opera” [−0.18, citing the short-run price elasticity from Houthakker and Taylor (1970)]. In explaining why the price elasticity of the demand for green peas is more than 14 times larger than for theater and opera performances, he cites two factors: first, the likely small real income effect that would accompany any change in price for arts consumers who are expected to have much larger than average incomes, and second, the many more close substitutes for green peas than there are for theater and opera performances [Frank (2006, p. 128)]. This explanation is consistent with the view that there is something inherent in the performing arts that would yield very low price elasticities, i.e. limited substitutes. Yet again, any such explanation ignores the question of “substitutes at what price” and the issue of localized competitive conditions [Seaman (2004)]. It also fails even to consider why such firms (assuming some market power) would choose to operate so far from the seemingly rational average price level (i.e., the one approximating unit price elasticity when marginal costs approach zero).

In summary, estimated arts price inelasticity may simply reflect pricing in the inelastic range of demand curves or, when using excessively aggregated data, the failure

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²⁶ See Lévy-Garboua and Montmarquette (1996, p. 206) and further discussion in Section 7 below.
to capture the range of differing arts consumer segments. At the same time, theoretical clarifications as to the full price of arts consumption, either by distinguishing arts attendance from arts appreciation or by clarifying the possibly low weight that ticket price alone has relative to the full cost, could suggest that the arts do indeed have lower price elasticities than other goods and services when properly evaluated at comparable prices.27

4.3. Income elasticity differences by level of aggregation

Despite the somewhat mixed results for price elasticity, the results are even more ambiguous for income elasticity. Pommerehne and Kirchgassner (1987) found income elasticities greater than 1.0 in German theater for both average- and high-income consumers, but with higher-income people having lower income elasticity than do average-income people. However, while they used this differential income result in their summary, they warned about the low level of statistical significance in their income results and noted “income elasticities are not much larger than one” (p. 48).

Felton’s results were more indicative of the varying income elasticities derived in more refined studies. Felton (1989) found no statistically significant income elasticities for her individual opera companies, and found (1992) income elasticities of either less than one or about one for her two largest orchestra groups (again, while this is still fairly aggregated, it at least distinguishes orchestra size). Felton (1992) did, however, find luxury good evidence for her highest and second highest budget samples of ballet companies (but nothing significant for opera). Felton (1994/1995) also found a higher income elasticity of 1.4 for her “total attendance” group vs. an elasticity of only 0.82 for her “subscriber” database for US orchestras. By contrast, Luksetich and Lange (1995) found no statistically significant income elasticities at all in their large market vs. small market study of orchestras. Unfortunately, neither Schimmelpfennig (1997) nor Abbé-Decarroux (1994), who did such useful work regarding more disaggregated price elasticities, were able to estimate any income elasticities since they lacked income data.

Superficially, the strongest evidence for income elasticity estimates being notably different when less aggregated data are utilized is Greckel and Felton (1987), who derived a statistically significant income elasticity of 6.13 in their second demand equation for the Louisville Orchestra, although their other orchestra income elasticity of 2.66, as well as the 2.26 estimate for the Bach Society were not statistically significant. Furthermore, this suspiciously high income elasticity of 6.13 is derived in an equation with only ticket price and concert hall capacity as control variables. Even more importantly, that high

27 However, since other forms of entertainment with lower ticket prices share these characteristics, this conclusion is not inevitable. Furthermore, a focus on the weight of the admission price relative to the full consumption price would suggest that a sport like cricket, where a match can last for up to five days, would have the lowest comparable price elasticity of demand of nearly all live entertainments; regrettably, despite their insightful analysis of county cricket, Paton and Cooke (2005) do not estimate price elasticities.
income elasticity estimate dropped to the 2.66 noted above and lost statistical significance when a proxy variable was added to account for a four-year period in which the conductor of the Louisville Orchestra and his successor were widely unpopular. Hence, this evidence for high income elasticities of demand when using organization-specific data is not compelling.28

Abbé-Decarroux and Grin (1992) also studied individual (Swiss) arts organizations, and estimated logit models that included pre-tax monthly personal income, but the estimated attendance probability coefficients were quite small (although statistically significant for two of three organizations). Only one of the Corning and Levy (2002) income elasticities for their target theater company across three geographical venues exceeded one while also being statistically significant. Gapinski’s (1984) study of production and demand functions for the Royal Shakespeare Company (RSC) did generate a statistically significant income elasticity above one (1.33) in an equation with only price and the constant term. While he was willing to conclude that “an RSC cultural experience is a luxury good”, he faced considerable difficulty in eliminating autocorrelation and heteroskedasticity problems and, even after correcting for those problems, was forced to eliminate seven of his eight demand equations “because of intercept or substitute-price insignificance” (p. 463). Thus, the evidence is mixed that estimating demand at the individual organizational level will reliably result in higher income elasticities compared to more aggregated data.

In the following sections we discuss a range of problems encountered in econometric studies of arts demand, beginning with that of model selection.

5. The modeling problem: Single versus simultaneous equations

Economists have wrestled with the important issue of whether to model arts demand using a single equation, i.e. by treating the performing arts market as essentially a recursive process in which supply decisions are not determined in the same time period as demand, or to model arts demand as one of several equations in which key endogenous variables are determined simultaneously, hence requiring more complex estimation techniques.29 In this section we consider these measurement and modeling issues by de-

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28 Carson and Mobilia (1989) also found high standardized income elasticities for Broadway that were highly sensitive to seasons, with highly positive income elastic demand for the fall, winter and spring seasons, but highly negative income elastic demand during the summer season. Given the outlier nature of their estimates (+5.78 to −4.74) and the lack of any modeling foundation compared to, say, Moore (1966), who found dramatically different results (although not adjusting for seasonality), it is difficult to know how much weight to place on these income elasticity results.

29 Another modeling issue that has been less prevalent in the arts demand literature, but is nevertheless important, is the functional form to choose when estimating a system of demand equations for differentiated goods so as to make parameter estimation feasible. For example, both logit and the almost-ideal-demand-system [e.g., Pommerehne and Kirchgassner (1987)] can be viewed as imposing constraints on substitution patterns so as limit the number of parameters that would have to be estimated.
scribing the key features of three representative studies: Moore (1966), Withers (1980), and Luksetich and Lange (1995).

5.1. Moore: “The demand for Broadway theater tickets” (1966)

Moore did not present an explicit utility maximizing framework, but focused on developing a defensible econometric model to estimate demand elasticities that may solve the puzzle of low Broadway attendance growth. Since ticket prices were fixed in any one time period, an explicit time-series model was necessary to derive price elasticity, and a more broadly defined full attendance cost elasticity of demand. However, he also examined the determinants of the cost of an evening of entertainment per person beyond the cost of tickets by using cross-section analysis from data derived from a survey of seven Broadway houses and 18 performances. He also used the cross-section survey results to estimate an income elasticity of 1.03 based on relative frequency of attendance as a function of income.

His time-series model included three equations related to the ith time period, with \( A \) representing attendance, \( Y \) a measure of permanent income, \( C \) the cost of attending the theater, \( S \) the number of shows, \( P \) ticket prices, \( M \) a dummy variable for sound movies, \( T \) the transportation cost to the theater, and \( O \) the other costs of attending a Broadway play:

\[
\begin{align*}
A_i &= f(Y_i, C_i, S_i), \\
S_i &= g(A_i, P_i, M_i), \\
C_i &= h(P_i, T_i, O_i).
\end{align*}
\]

He then postulated that average attendance per show was probably a constant, so that a long run equilibrium condition could be expressed as \( A = \alpha S \), yielding a four equation system with four endogenous variables, \( A, S, P \) and \( C \). However, since it could not be assumed that the market was necessarily in long-run equilibrium, price was treated as exogenous. Furthermore, given the lack of adequate data regarding travel expenses and other expenses of attending the theater, he assumed that such costs, including those related to population movements within the New York area, had no trend over his 1928–1963 time period and were uncorrelated with the other variables, allowing him to drop Equation (3) and substitute price \( P_i \) for cost \( C_i \) in Equation (1).

These modifications allowed him to estimate three basic variations of the model:

1. a “naive” approach that assumed that the supply of shows was determined outside the system, estimated both as linear and multiplicative;
2. a simultaneous equation approach using two-stage least squares (again both linear and multiplicative); and

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30 Throsby and Withers (1979, p. 111) observed that time-series analysis is more appropriate “for past analysis and for prediction” since time-series data are capable of describing the effect on behavior of changes in a variable, whereas a cross-section elasticity can only describe the effects of differences in that variable.
two-stage estimation, but with the income elasticity constrained to equal its value estimated from the cross-section data (i.e. 1.03) as a way to limit the bias in the income elasticity estimate created by the absence of population and travel expense variables, which are likely to be correlated with income.\textsuperscript{31}

The three most important results are:

- the price and income elasticities were less than one in absolute value, and those results were largely independent of the specific econometric specification;
- the low income elasticity results in all of the time-series estimations were surprising to Moore and prompted him to observe that he had not been capable of controlling for the opportunity cost of time; and
- despite the fact that Moore believed that it was a “dubious” assumption to consider the number of shows (his Equation (2)) as being determined “outside the system”, the fact that shifting to two-stage estimation increased the price elasticity results only trivially compared to the naive single-equation cases has led most later researchers to justify the use of single-equation recursive techniques.

5.2. Withers: “Unbalanced growth and the demand for the performing arts: An econometric analysis” (1980)\textsuperscript{32}

The basic model was a straightforward application of theory postulating quantity demanded as a function of relative prices and income, adjusted to reflect the realities of using aggregated data applicable to the entire performing arts for the period 1929–1973 (largely from the US Survey of Current Business). Hence, the general estimating equation, defined for all time periods $t$, was:

$$
\frac{Q}{Pop} = f(P_A, P_S, I, D),
$$

where $(Q/Pop)$ is the number of attendances per capita in the population, the $P$ terms are the price of attendance and the price of substitutes, respectively, $I$ is income, and $D$ is a measure of the distribution of income (defined to increase with inequality favoring the wealthy). Expected partial derivatives are positive for all variables except own-price. Withers’ normalization of the attendance dependent variable by dividing by population became conventional in many arts demand studies.

Withers’ critical contribution was to adapt the Owen (1969) approach to adjusting hourly wage rates by the unemployment rate so as to better measure leisure price, and then to utilize the Becker (1965) concept of full income (defined over all available hours, not just working hours) so as to impute leisure time as part of this full income, while incorporating the price of leisure into the consumer price index deflator. This generated

\textsuperscript{31} An approach recognized as problematic by Moore and others, such as Throsby and Withers (1979, p. 111).

\textsuperscript{32} Withers’ study was a development and application of a model originally proposed in Throsby and Withers (1979, Chapter 3).
the alternative “time allocation” estimating model defined for all time periods $t$:

$$\frac{Q}{\text{Pop}} = f (P_A, P_S, P_L, F, D)$$

(5)

with the new variables $P_L$ defined as the price of leisure, and $F$ as full income. In turn, those two variables are defined as:

$$P_L = w(1 - U_R),$$

(6)

where $w$ is the hourly wage rate and $U_R$ is the unemployment rate, and full income is the standard Becker formulation:

$$F = T_C P_L + T_W w + Y$$

(7)

with $T_C$ and $T_W$ defined as hours of consumption and hours of work $(1 - T_C)$, respectively, and $Y$ defined as property income. An adjusted price index was also derived incorporating the leisure price. The expected signs on the first partial derivatives are the same as in the non-time allocation model for own-price, substitute price and income distribution ($D$), and negative for the two new leisure price variable ($P_L$), while positive for the full income variable ($F$). The arts are considered a priori to be a “superior time-intensive good” in this formulation.

Withers utilized single-equation estimation, justified in part by the Moore (1966) results, but also by his belief that the performing arts market is inherently recursive in structure, with price in one time period affecting attendance in that same period, but any supply of new performances having an observable effect no earlier than the next time period. The latter hypothesis is attributable to the “advance planning and announcement of production and seasons and their prices that is typically required in this industry” [Withers (1980, p. 737)].33 Thus, ordinary least squares was used with the double-log transformation, which he also justified by prior econometric evidence that this form is preferable for non-necessities in single good estimation (pp. 737–738).

There are two broad reasons for the popularity of the Withers (1980) results. First, the largely successful decomposition of the effect of rising income in the time allocation model into a relatively high “full-income” effect offset by a smaller real leisure price effect is consistent with a priori expectations that the arts can indeed be considered luxury goods that are time-intensive in consumption. Second, the low price elasticities in the more structurally sound time-intensive model (which increase to approximately unity or are only modestly elastic in the conventional model) are also consistent with a priori notions among many arts economists. Of course, these price elasticities are applicable to an extremely aggregated measure of the performing arts, and do not apply to specific organizations in specific product and geographic markets, nor does their interpretation

33 Heilbrun (1984, 1996) stressed the difficulties in smoothly increasing the quantity supplied of arts services and emphasized the role that periodic supply shifts can play in later stimulating observed increases in arts attendance. However, that issue is never linked in the econometric literature to the choice of single or simultaneous equation methods.
reflect any sensitivity to the issue of the level of prices at which such “industry-wide” elasticities are estimated, as discussed above.

Interestingly, Withers’ (1980) cross-price elasticity results for reading and recreation are rarely cited, even though they are generally higher than the cross-price elasticities estimated by Gapinski (1986). Of course, Gapinski’s data were much more disaggregated, so that he was also able to estimate cross-price elasticities faced by individual arts organizations (three of which were indeed quite high). Furthermore, the substitute prices were much better defined as the ticket prices charged by the other art forms. Another relatively ignored feature is Withers’ conclusion that the results potentially weaken the case of government support of the performing arts on the grounds of financial distress. That is, the high income elasticities only partially offset by the elasticity of the price of leisure together with the relatively low price elasticities of demand, suggested to Withers that “the potential for continued growth of private market support for the performing arts should be recognized” (p. 742). It is ironic that this conclusion would be downplayed inasmuch as the very title of his paper announces his interest in exploring the unbalanced growth issue in the performing arts.

Ekelund and Ritenour (1999) represents a rare subsequent attempt to focus on this problem and isolate the effect of the time costs on US symphony concert demand using a less aggregated unit of analysis than Withers, although still an aggregation of anonymous individual orchestra data. They estimated a single linear OLS equation, which they suggested may be even more justified for orchestras than for Broadway as studied by Moore (1966), also independently testing for possible simultaneity bias. They regressed annual per capita symphony orchestra concert attendance on average ticket price, the price of audio recordings, annual real disposable income, and their key variable, the cost of time (as measured by the annual average real hourly wage rate). Only the coefficient on the substitute price variable behaved poorly (negative in sign rather than positive, and significant at only the 0.10 level). The own-price coefficient was negative and strongly statistically significant (although low in magnitude consistent with a

34 See further in Section 8. This aspect of the Gapinski (1986) results can easily be missed. For example, Fernández-Blanco and Baños Pino (1997) observe that Gapinski “shows that the best substitute for a theater play is not a film, but a different theater play” (pp. 62–63). In fact, the substitute price for the two theaters in the Gapinski database is the average of prices of opera, symphony and dance only [Gapinski (1986, p. 21)].

35 Another forgotten feature of the Withers results is that when his model was applied to both Australian and Canadian data in Throsby and Withers (1979), the results were not as strong statistically. In the Australian case, while the ticket price elasticities were largely consistent with the American results, no significant income effect was found using either the conventional or the time allocation model (pp. 115–117). While Throsby and Withers attributed some of these problems to weaknesses in their Australian data, it is interesting that those data were at least less aggregated than in the US case (i.e. applying to seven major professional performance companies, although over a shorter time period of 1964–1974; p. 115). Any degrees-of-freedom and related problems were even more severe in the Canadian data, and the model could not be estimated in that case at all [Throsby and Withers (1979, p. 112)].

36 Ekelund and Ritenour acknowledged this aggregation problem by noting that results may be different if city or SMSA data were to be used for specific orchestras, citing some panel data evidence supporting that possibility.
low ticket price elasticity of demand), while income had a positive effect on attendance per capita (but with a normalized coefficient suggesting less than unit elasticity), and the wage rate (value of time) had a negative coefficient.

Despite its modeling limitations and remaining aggregation problems, the Ekelund and Ritenour (1999) results are consistent with the fundamental idea that any positive income effect on arts demand will be partially counterbalanced by the time-intensive nature of live performances and the opportunity cost of that time. They were duly cautious in evaluating their findings, but interestingly tended to stress the threats to the arts resulting from their results in contrast to the more optimistic assessment provided by Withers (1980).


Luksetich and Lange had previously employed two-stage least squares methods to estimate orchestra demand.37 Their key findings in 1984 were:

- price elasticities varied by orchestra size, becoming more elastic as the size of the orchestra fell, with major orchestra demand quite inelastic and metro orchestra demand modestly elastic;
- the price elasticities became less elastic with the inclusion of a donor price variable (measured as total donations divided by attendance), although the donor price elasticities themselves were not statistically significant;
- their total sample price elasticity estimate of about $-0.48$ both with and without donor price was notably close to estimates from major prior studies; and
- they concluded that “in general” when comparing the OLS and the 2SLS results there was support for the latter, and the elasticities of the non-price determinants were stable regardless of procedure.38

The superior database for the 1995 paper allowed for a more thorough exploration of the relationship between factors under managerial control and various orchestra performance measures, which they modeled as a six-equation system with attendance, average price, administrative expenses, orchestra quality (using non-administrative orchestra spending as a proxy, an expansion of the “wages” variable they had used in 1984), number of concerts, and donations simultaneously determined. The model was

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37 See Lange and Luksetich (1984). A related paper [Lange, Luksetich and Jacobs (1986)] confirmed that equations for orchestras of different size and classification should be estimated separately; see also Luksetich and Lange (1995, p. 52).

38 However, the case for the superiority of the more complex approach was not overwhelming. The authors noted that the estimated equations of “price” from the single-equation estimation of 2SLS varied widely regarding the adjusted $R^2$ results across the orchestra sub-samples, possibly suggesting that the instrument price in the second stage was not necessary because the firms were not price takers so that no supply curve existed [Luksetich and Lange (1984, p. 43)].
estimated using 2SLS regression, the second stage being estimated using pooled cross-section, time-series techniques with estimates corrected for heteroskedasticity and serial correlation.

Luksetich and Lange (1995) is perhaps the best example of estimating arts demand as part of a multi-equation simultaneous equation system using 2SLS estimation techniques to date. Their findings are summarized here. While a surprising omission in the demand equation was any measure of regional educational level, the most important findings related to the low price elasticities of demand for each orchestral group. Although this is a familiar result with aggregated data (although here at least segmented by orchestra size), it has especially interesting implications for orchestral full-income-maximizing (ticket-plus-donation) pricing strategies and for the interpretation of price elasticity results when organizations have multiple interrelated revenue sources, as discussed in Section 4.2 above.

Regarding the individual components of the demand equation, ticket price performed well with a derived price elasticity of $-0.33$ (p. 56). Surprisingly, quality had a negative effect on per capita attendance, although their quality proxy of artistic personnel and total concert production expenses per concert was shown by Tobias (2004) to be an unreliable predictor of expert opinions regarding the quality of arts organizations. The result that the number of concerts per capita in the region was a strong predictor of regional attendance per capita was consistent with arguments that variations in the sheer availability of artistic resources is critical to explaining attendance variations [Heilbrun (1984, 1996), Gold (1980), Khakee and Nilsson (1980)], but in a model expressly designed to correct for simultaneity bias, it is surprising that attendance did not also appear as an independent variable in the concert equation.

The most noteworthy results of the Luksetich and Lange (1995) analysis relate to the interaction of ticket buying and voluntary donations. Not only were the implied price elasticities low for all three orchestra types, but the interactions between the ticket price and gifts per capita further clarified the fact that orchestras have been following an excessively low price strategy. That is, even when adjusting for the possibility that higher ticket prices would induce arts patrons to partially reduce the donated portion of their “full price” of attendance, orchestras would generate more total income if they were to substantially increase average ticket prices (even ignoring more targeted price increases that might be justified if the audience could be further segmented). For major orchestras, the mean elasticity of gifts per capita to ticket price was $-1.19$ (p. 56). But, even considering that interaction between revenue sources, the authors calculated that the major orchestras could double the average ticket price from its current mean value in order to maximize ticket revenues, but more importantly could increase ticket prices as much as 62 percent and still maximize the sum of ticket-plus-donated revenues (p. 58).

Of particular importance was their calculation that following such a ticket price increase, the resulting average-ticket-price elasticity of demand at those higher prices was still well within the inelastic range at $-0.65$, fully consistent with the sports literature result that the optimal price for such “performance firms” is to actively price in the
in the inelastic range of their demand curves, hence explaining the “paradox” of low price elasticities estimated in empirical demand studies.\textsuperscript{39}

6. The multicollinearity problem: Education versus income

The non-econometric evidence considered in Section 2.3 above demonstrated that education is likely the most important single variable in explaining variations in performing arts attendance. However, regression-based models have not generally succeeded in confirming this result. While the typically high correlations between education and other key independent variables (class, occupation, age, and even ticket prices in some models) is a key reason, multicollinearity is not the only complication.\textsuperscript{40} Competing measures of education, distinctions between arts training and general education, and conceptual conflicts regarding the underlying causal relationships are also to blame.

The issue of how to measure education and whether to distinguish it from arts specific training at home, arts specific training in school, or just from past experience is highly problematic. As McCaughey (1989) asserts, “the reasons for the positive association of general educational attainment with participation in the arts are not fully understood; and how specifically arts education fits into this association is not clear” (p. 48). For example, Orend and Keegan (1996) and Relish (1997) stress the socialization or network effects of education in affecting arts participation rates, while Globerman and Book (1977) put education into a consumer production function model, although with only limited success in isolating a unique “consumption efficiency” effect on arts demand. It is also possible that education reduces search costs and generates more accurate perceptions of performing arts prices, a possible link to attendance established by Globerman (1978).

The Globerman and Book (1977) contribution is unique. While education is most commonly cited as merely a taste-determining variable, cultural economists are perfectly comfortable with viewing education as one form of specific consumption capital affecting relative shadow prices, and hence the constraints, facing arts consumers. However, no one else has actually tested for an explicit education consumption efficiency

\textsuperscript{39} Metro orchestras appeared to have come closer to their optimal pricing strategy, requiring only about a 10 percent price increase to maximize combined ticket and donation revenues (the price elasticity of gifts was quite small for those orchestras), while small market orchestras were in the unique but bizarre position of being able to maximize ticket revenues with only a 31 percent price increase, but would actually generate even higher combined ticket and gift revenues if they were to raise ticket prices by 57 percent (the result of having an estimated positive elasticity of gifts with respect to ticket prices); see Luksetich and Lange (1995, p. 60).

\textsuperscript{40} For example, due to the high correlation between incomes and prices over time, Goudriaan and de Kam (1983) could not get statistically significant elasticity estimates for both in their time-series demand equations for theater and concerts without imposing a constraint on the income elasticity from their separately estimated cross-section equations. While they were aware of the weaknesses to that approach [citing Kuh and Meyer (1957) on problems with extraneous estimates], they observed that “there was no alternative to get significant results” (p. 39).
link to arts attendance. Despite its creative application of the consumer household production model [Michael (1972); Michael and Becker (1973)], the Globerman and Book (1977) effort to isolate this effect yielded only mixed results.41

Regardless of the exact causal connection between education and arts consumption, the various classifications of formal schooling are common measures of “education” in econometric studies. The specific way such formal education enters those equations depends on the data being used and the unit of analysis being studied. In what might be called “Type A” (aggregative) studies, the aggregate attendance or participation behavior of the population is known, but the data are not based on the attendance patterns of specific individuals with known personalized demand-determining characteristics.42 The dependent variable is typically some version of attendance at specific arts organizations normalized by the regional population in which they are located. Consequently, the education independent variable must reflect the aggregative characteristics of the population in that region (e.g., “percent of the population with a college degree” or “median years of schooling”, etc.). The same measurement issues arise regarding income in Type A studies (i.e. “percent of the population earning above $30,000” or “per capita disposable income”, etc.); but some localized measures of income are typically incorporated into those demand equations. These studies sometimes also incorporate measures of local performing arts ticket prices or even prices of substitutes and organizational quality proxies.

Alternatively, in “Type P” (personalized) studies, the attendance or participation behavior of particular individuals can be matched to their unique demand-determining characteristics. Dependent variables can be continuous (e.g., “number of arts events attended”, or “number of attendances”) or binary (e.g., “1 if attended at least one time, 0 if did not attend at all”). In Type P studies a wider variety of educational variables can be included beyond the usual formal education measures, and in fact, distinctions can be made between own education, parents’ education (sometimes distinguished by gender), specific types of education (e.g., art training at home versus at school), or diverse measures of exposure to various art forms or practical training in those fields. However, they are not capable of incorporating arts organization prices or organizational quality. At best, a variable can be inserted such as “lives in city over 50,000” [Lewis and Seaman (2004)] to try to capture some of those localized “fixed effects”. In this sense, Type P studies are not estimations of well-defined demand functions.

The results of 12 econometric studies that include both income and education variables are fully documented in Seaman (2005, Table 14). Gapinski (1981) viewed

41 Seaman (2005, pp. 90–94) provides the details.
42 As usual, the variability in databases can create anomalies. For example, Bajic (1985) had access to subscriber lists (not audience survey data) for both the St. Lawrence Theatre and the Toronto Free Theatre. While this provided information on the residential location of individual subscribers and hence allowed the construction of an independent variable measuring commuting distance to the theaters, there was no personalized information on education or income – hence requiring the construction of an aggregated measure of education and income per “zone”.
his own elasticity estimates as only tentative, but paid homage to the Ford (1974, Vol. II) non-regression based findings by noting their general similarity to his results. More importantly, the overall results of the 12 studies provide only relatively weak confirmation that education measures reliably outweigh income measures as determinants of arts demand. Only five of the studies (41.7 percent) found evidence for the dominance of education; strong pro-education evidence is in Ganzeboom (1989) and Peterson, Hull and Kern (2000). Gapinski (1981), Gray (2003), and Lewis and Seaman (2004) provide modestly strong evidence that education outweighs income, while two studies generated opposite results favoring income [Bajic (1985); Bonato, Gagliardi and Gorelli (1990)]. Although Globerman and Book (1977) focused on the separate issue of whether the role of education is consistent with the household production model, their estimated elasticities were higher for income than for education, providing some evidence against the education dominant hypothesis.

The remaining four studies yielded ambiguous results. Goudriaan and de Kam (1983) did not calculate education elasticities, making direct comparisons difficult; however their t-statistics on the education variable were very high (but with the non-normalized coefficients, difficult to compare in economic significance across determining variables). Meanwhile their income elasticities were only high when age and education are dropped from the equations. Jenkins and Austen-Smith (1987) generated a higher education-demand elasticity in their two-stage least squares equation but a lower elasticity relative to income using OLS. But in both cases, the standard errors were quite high when both variables were included along with “social class”. The income coefficient in Dobson and West (1989) was negative, but the standard educational variable was also weak and statistically insignificant. Their strongest results were for two formal education substitutes: childhood participation in non-school theater performances as opposed to school-related performances, as well as childhood theater participation rather than just exposure to the theater, both strongly influenced adult theater attendance. Finally, Abbé-Decarroux and Grin (1992) did not utilize a formal education variable, but found similar evidence to that of Dobson and West (1989) that “arts training” variables performed well (although their variables did not distinguish between home and school exposures). But they also found fairly strong evidence for the importance of income (although less strong than for the arts training variables).

7. The taste cultivation problem and human capital: Habit formation, learning-by-consuming and rational addiction

Cultural economists have always stressed that current arts demand (whether for live performing arts services or the stock of tangible art works) is especially influenced by past arts exposure, and hence that inter-temporal dynamics should be incorporated into a well-specified demand model. Nevertheless, except for indirectly addressing this issue via the inclusion of age, education, or childhood exposure [e.g., Morrison and West (1986)], explicit inclusion of lagged dependent variables as separate determinants
has been relatively rare. Only Houthakker and Taylor (1970), Goudriaan and de Kam (1983), Oteri and Trimarchi (1990), Krebs and Pommerehne (1995) and Urrutiaguer (2002) included a one-year lagged endogenous dependent variable, and in each case it was strongly positive and statistically significant. Carson and Mobilia (1989) defined the lag differently. Their much shorter weekly lagged dependent variable had negative effects on current attendance, a result they explained as capturing the effect of infrequent arts consumption such that very recent attendance actually reduces the likelihood of attending again in the current period. With a longer lagged dependent variable of even one year, what seems to be captured is not infrequent and discrete arts consumption patterns, but a proxy for the cumulative effect of some version of what might be called the cultivation of taste. It is not always appreciated that there are multiple versions of this phenomenon, with each having somewhat different implications for our understanding of arts demand and for optimal arts marketing strategies. In the following sections we consider three such explanations: habit formation, learning by consuming and rational addiction.

7.1. Habit formation

The most “passive” explanation for past consumption affecting current and future consumption is simple habit formation, the behavioral inertia so characteristic of much of human behavior [Houthakker and Taylor (1970); Pollak (1970)]. If habit formation is the primary reason for the strong performance of lagged dependent variables in arts demand equations, arts managers should go to great lengths to introduce the arts to young audiences with regularly scheduled targeted programs to get them into the habit of attending, regardless of any particular human capital formation effects. In fact, the

43 Krebs and Pommerehne attributed the difference between their estimated low short-run price elasticity (−0.16) and the higher long-run elasticity (−2.6) to the stronger impact of their one-year lagged attendance variable (actually mislabeled as a lagged quality variable in their Equation (1A), p. 26). They interpreted this result, following Houthakker and Taylor (1970), as reflecting “habit formation”, although their partial adjustment model (where consumers are assumed to partially adjust to long-run equilibrium) was not identical to their predecessors’ “stock adjustment” model [see Krebs and Pommerehne (1995, p. 25, and their Note 25, p. 30)].

Lévy-Garboua and Montmarquette (1996) emphasized the two most interesting reasons identified by Pollak (1970) for a distinction between long- and short-run demand functions, ignoring his more institutional “contractually fixed commitments” explanation [Pollak (1970, p. 745)]. Thus, while Pollak originally did have a three-fold classification scheme, only two approaches were cited by Lévy-Garboua and Montmarquette. They defined the simple “habit forming” phenomenon identified by Pollak (his third case) as a “deterministic approach”, by which any type of habit formation or the creation of consumption capital, whether myopic or farsighted, is considered an inevitable reality of the human condition (p. 28). This was contrasted with Pollak’s second approach stressing the ignorance of consumers about their own preference orderings “outside the range of . . . past consumption experience” who rely upon personal experience through “a time consuming learning process” [quotations from Pollak (1970, p. 745)]. Lévy-Garboua and Montmarquette (1996) also cited two other antecedent related approaches (Note 2), but seem to have been the first to actually use the phrase “learning-by-consuming”.

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important role of specific consumption capital is closely associated with the notion of rational addiction discussed below.

Houthakker and Taylor (1970) remains the classic “state-adjustment” dynamic model linked to habit formation, estimated using OLS as part of a comprehensive study of consumer demand in the United States (reporting results for 82 separate spending categories). While they also reported results for motion pictures and spectator sports, their estimated equation for “legitimate theater and opera” is often cited, both for the specific derived short-run versus long-run “relative price” elasticities (−0.1827 and −0.3109, respectively) as well as for their conclusion that while theater and opera are subject to habit formation, it “wears off quite rapidly” (p. 131). While not as frequently cited, they also derived short- and long-run elasticities with respect to total expenditures, (0.7407 and 1.2604, respectively). Their equations for all spending categories were estimated over the period 1929–1964 using the *Survey of Current Business* as the principal source of data.

The Globerman (1978) approach to indirectly isolating the effect of past consumption on present consumption is novel in the arts demand literature. He investigated the determinants of public perceptions about performing arts prices, including the role played by past attendance in generating more accurate price perceptions that can be viewed as stimulating attendance. His approach might be viewed as a more traditional price search model in contrast to the “utility function search” model of Lévy-Garboua and Montmarquette (1996); see also Brito and Barros (2005). Furthermore, Globerman’s finding that higher levels of formal education are at times related to lower perceived minimum arts prices is suggestive of an important and generally ignored link between education and attendance that requires neither a “taste development” explanation, nor even a beneficial productivity effect in a household production context [as in Globerman and Book (1977)].

7.2. Learning by consuming

Another version of taste cultivation has become known as learning-by-consuming, in which consumers are characterized as uncertain about their utility functions but learn their own subjective preference structures through a process of consumption experiences generating either positive or negative feedback [Lévy-Garboua and Montmarquette (1996); Brito and Barros (2005); Ulibarri (2005)]. Abbé-Decarroux and Grin (1992) presented a “hybrid” type of learning-by-consuming model, in which consumers already have well-defined utility functions (with older consumers being especially risk averse), but poor knowledge about the product characteristics of different suppliers which can be clarified by positive and negative feedback from a kind of “lottery” of actual consumption. These models can have implications for the programmatic choices of arts managers.45 Globerman (1978) put forward a search model that has some sim-

45 Usually biased toward less esoteric and less risky programming; see, for example, Abbé-Decarroux and Grin (1992).
ilarities to both passive habit formation and a broader interpretation of learning-by-consuming that relies upon a process of price discovery rather than taste discovery.

Lévy-Garboua and Montmarquette (1996) has become the most cited example of the learning-by-doing approach. Their approach to the dependence of current consumption on past consumption did not include a lagged endogenous dependent variable in their estimated equations, but focused instead on the contrast between the various predicted effects of key variables in testing their learning-by-consuming model (1996, p. 39). They confirmed the methodological challenge of how best to incorporate past consumption into studies of current consumption by observing that despite the general consensus among economists and sociologists that such effects are important for a wide variety of goods, “it is seldom possible to directly verify this assertion . . . using individual data and after controlling for many wealth, price and taste variables” (pp. 27–28).

Their approach fully accepts the non-Beckerian premise that changes/differences in behavior can be linked to taste changes/differences rather than subtle constraint variations and incorporates two key elements: first, any new experience of a good to the consumer reveals an unexpected positive or negative “increment in his taste” for the good, with this increment treated ex ante as a random variable with zero mean; and second, the concept of someone developing a taste for an art form such as the theater can be viewed as their having experienced repeated pleasant surprises when attending plays and hence revising expectations upward. Lévy-Garboua and Montmarquette (1996) claimed three theoretical advantages for this representation:

- it is compatible with an assumed strong heterogeneity of tastes and the independence of individual choices;
- it allows for extensive differentiation of cultural goods further magnified by the “unique nature of each ‘cultural’ experience providing new possibilities for surprises and implies long learning periods”; and
- it maintains intertemporal separability of the utility function conditional on past consumption by viewing consumers as having uncertainty regarding their preferences that prevents them from rationally anticipating the future taste (utility) that will be acquired over time (p. 28).

A full description of their quite complex model is beyond the scope of this chapter, however, the especially important features can be identified. The utility function includes the quality-adjusted quantities for all goods \( i = (1, \ldots, r) \) whose consumption “may give rise to non-systematic cultivation of taste” (1996, p. 28):

\[
U = u(s_1x_1, \ldots, s_rx_r),
\]

where \( x_i \) = the quantities consumed of market goods and the \( s_i \) weights represent “subjective qualities” anticipated before the decision is made to consume the goods; these weights depend on previous consumption experiences. A similar utility function can

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46 See Seaman (2005) as well as their own more concise description in Lévy-Garboua and Montmarquette (2003).
be defined for each time period. If we now define \( x_a \) as attendance at an arts performance, the effect of consumption experiences that yield additional information about the subjective quality of that good, \( s_a \), can be represented in period \( t \) as:

\[
s_t = E_{t-1}(s_t) + \gamma_t \quad \text{if } x_t > 0,
\]

where \( E_{t-1} \) represents the expectation operator before period \( t \)’s choice, and \( \gamma_t \) is the “taste surprise” experienced in period \( t \) (i.e. \( E_{t-1}(\gamma_t) = 0 \)). This can be called the “experienced taste for arts consumption in period \( t \)”. As noted above, consumers who find themselves “developing a taste” for music (for example), will generally experience pleasant surprises, i.e. \( \gamma_t > 0 \) is more common than the reverse. Consumers are viewed as basing their expectation of taste solely on their past experiences. Therefore, taste expectations are identical across all time periods (as noted, preserving the intertemporal separability of the utility function). Lévy-Garboua and Montmarquette then define a taste-constant Frisch demand function (i.e. marginal utility of income or wealth constant in contrast to Marshallian demand functions) that suggests that a good such as arts attendance that is assessed by a consumer as having a high quality will have a low “personalized price”. However, analogous to the household production model of the new consumer theory when the marginal product of any unit of attendance is quite high in producing “arts appreciation”, this greater potency of each unit of attendance in generating quality also implies that less quantity of the good \( x \) is required to achieve a given utility level (see Equation(8) above).

This generates a key insight from the learning-by-consuming approach, and allows Lévy-Garboua and Montmarquette to “impute” a price elasticity of demand from their empirical analysis even though they are missing a price variable in their vast database. That is, if the price elasticity of \( x \) is \( > 1 \) in absolute value, the experience of consuming the arts will have a positive effect on current consumption when the good was “enjoyable overall”, but a negative effect when it was not (1996, p. 30). They clarify this relationship by modifying the demand function so as to isolate the marginal effect of quality on the quantity of the arts consumed, \( \frac{\delta x}{\delta s} \), which they derive after several steps to be:

\[
\frac{\delta x}{\delta s} = -\frac{x}{s}(1 + e),
\]

where \( e \) designates the price elasticity of demand for \( x \). This directly implies that

\[
\frac{\delta x}{\delta s} \frac{s}{x} = -(1 + e),
\]

i.e. that the elasticity of arts attendance with respect to perceived arts quality (which they call the “taste elasticity”) = \( -(1 + \text{own price elasticity of demand for arts attendance}) \).

That elasticity is \( > 0 \) if \( e < -1 \), i.e. if the price elasticity is elastic. If the price elasticity is inelastic (\( e > -1 \)), the quality (or taste) elasticity of the demand for the arts becomes negative, and unitary price elasticity implies a zero quality elasticity. As interpreted by Lévy-Garboua and Montmarquette, this allows them to measure the price elasticity of
demand when the model measures accumulated experience and taste for consumption (1996, p. 30). As noted above in Section 6, normally price elasticity is not capable of being estimated in Type P studies due to the absence of data on ticket prices.

Since their Ministry of Culture survey database was rich in opinion type questions, some of the key empirical results referred to those variables. For example, the authors viewed opinions referring to greater appreciation of the actors and the quality of the text of the play as indirectly measuring the taste for the theater. Two of their constructed variables, were designed to measure taste more directly. They used the “appreciation scores” from 0 to 10 that respondents had assigned to a list of 56 (23 theatrical writers and 33 actors/directors), and designated high scores of 9 and 10 as indicating “evidence of a taste for the theater” (p. 39). But they then found that writers were seemingly treated differently than actors and directors (based on the performance of these variables in their estimated tobit model), so they identified a taste for reading as a substitute for live theater among those who showed a strong preference for writers, and vice versa for those giving especially high ratings to actors and directors. They found support for this view in the negative effect of reading journals and magazines on the frequency of theater attendance.

They found that the variable measuring the percentage of actors and directors known was the best measure of “the degree of familiarity with or experience of” the theater, and they designated a person who claimed to know more than 80 percent of the names put to him or her as knowing the theater well. They found it noteworthy that the performance of their variable designating knowledge of writers performed more poorly than their variable measuring knowledge of actors and directors, and concluded that “it is necessary to have attended the theater personally in the past in order to know the actors and directors whose talent can only be appreciated on the stage and in action” (p. 39). They thus identified this variable as their prime measure of previous theater attendance and predictor of current attendance (and based on their tobit estimation the probability of someone knowing more than 80 percent of the actors and directors not attending the theater fell from 0.49 to 0.02).

This finding then becomes the key to their imputing price elasticity from their survey data. They estimated the price elasticity of demand (see their Note 7) for their experienced group of theater consumers as $-1.47$ based on an application of Equation (10) above and the assumption that the average experienced consumer knows 85 percent of the actors and directors (yielding in their model an $s$ value = 0.85), and that this type of consumer attends the theater an average of 3.87 times per year (so that $x = 3.87$). These parameters along with the estimated logit coefficient of 2.1262 on their knowledge of actors and directors variable (interpreted from above to be $\delta x/\delta s$), yielded the calculation (which they do not explicitly show) of $e = -1.467$ for the more experienced consumer [see Equation (20) in Seaman (2005)] and $-1.0$ for the less experienced theater-goer.

It is easy to question the many steps and assumptions required to impute this result. But Lévy-Garboua and Montmarquette viewed it as fully expected from their model when one views experienced theater-attenders are those who have “completed their learning process” after experiencing many cases of pleasant surprises generating high $s$
values, high quality adjusted quantities of arts consumption and low personalized prices of consuming the arts. In their view, had theater experiences generally led to unpleasant surprises and a reduction rather than increase in the subjective quality assessments, the result would have been price inelasticity.

This approach of endogenizing the discovery of consumer utility functions via a learning-by-consuming process and testing the model without the use of a lagged consumption variable is unique, but is not the only empirical approach that might be taken. For example, Brito and Barros (2005) modeled the dynamics of demand and prices in a learning-by-consuming model and suggested that the standard empirical approach of using a lagged consumption variable is fully consistent with their version of that model. The unique finding of price-elastic demand for experienced consumers is also not an inevitable result of learning-by-consuming processes inasmuch as Brito and Barros (2005) derived the contrary expectation of both low income and own-price elasticities (p. 104) due to the way that flows of cultural good consumption interact with the decay of the stock of culture in response to an exogenous “shock” in the relative price of cultural goods in their particular dynamic model (pp. 97–98).

7.3. Rational addiction

Finally, past consumption can positively influence present and future consumption through rational addiction.47 The key assumption here is consistent forward-looking behavior where consumers maximize an intertemporal utility function and are willing to sacrifice current utility for future utility by making investments in human capital (either general education, or more targeted training). The opposite of myopic habit formation, this model actually requires the least of arts managers, who in the extreme need only maintain generally high quality standards; in so doing, it is suggested, they will not endanger the perception that the arts are one of those goods capable of yielding future utility through the sacrifice of current consumption in order to invest in the creation of human consumption capital. In contrast to the learning-by-consuming approach, the rational addiction model combined with specific consumption capital in a household production framework has a different modeling setup and can generate different implications, some of which were described earlier in the Section 6 discussion of Globerman and Book (1977).

Despite its popularity in the arts literature, attempts to verify a more technically precise version of this framework have not always succeeded. For example, while applied to cinema rather than the performing arts, Cameron (1999) found his results in testing for this phenomenon problematic and offering “little support” for the rational addiction model (p. 619). This is in large part due to the additional requirements that must be met in finding evidence for addiction in the more technical version of that model.

That is, the household production element of the rational addiction model generates an important distinction between shadow-price elasticities linked to arts appreciation and market-price elasticities related to observed arts attendance. But the intertemporal non-separability of the utility function feature of the model stresses the rate of time preference of consumers, i.e. their ability to be far-sighted rather than short-sighted. In this context, findings of “too-high” a rate of time preference is inconsistent with the premise behind the rational addiction framework.\textsuperscript{48} Tests for rational addiction also involve investigating the relationship between the interest rate and the discount rate. Lévy-Garboua and Montmarquette (2003) provided a concise description of the rational addiction perspective, and contrasted it to their own learning-by-consuming approach.\textsuperscript{49}

A key result derived from the formal analysis is that the “relative shadow price” of arts appreciation (as distinct from ticket purchases) will normally decline over time with the accumulation of arts-specific capital, be it from consumption or training [Smith (1998)]. There are two especially important implications of the rational addiction framework:

- While it might be thought that with a declining relative shadow price of art appreciation over time its quantity will grow as well, that will only definitely occur when the rate of time preference does not exceed the interest rate; more impatient consumers, therefore, may actually reduce their consumption of arts appreciation over time even in the face of a declining relative shadow price.

- As is true of any variation in the household-production-consumer-choice framework, even if consumption of the unobserved art appreciation ($X$) rises over time, there is no guarantee that the observed attendance at arts events ($x$) will similarly increase over time. As usual this is because with the cultivation of taste, increasing arts experience makes each unit of $x$ more productive in generating a unit of $X$. Since less $x$ can generate a given $X$, the net result is uncertain, although again $x$ is more likely to rise the lower is the discount rate and the higher is the interest rate.

Finally, this critical distinction between arts appreciation $X$ and arts attendance $x$ provides one of the theoretical justifications as to why one might expect an inherent bias toward relatively low price elasticities of demand for arts attendance relative to other goods at comparable explicit prices. That is, there is a distinction between the shadow price elasticity of $X$ in any time period ($E$) and the market elasticity of arts attendance ($e$). Specifically, the shadow price elasticity is always higher than the market price elasticity due to the effect of positive addiction. The key point is that there is nothing inconsistent between having a price-elastic demand for art appreciation $X$ and a market-price-inelastic demand for arts attendance $x$ [Lévy-Garboua and Montmarquette (2003, p. 206)].

\textsuperscript{48} McCain (2003, p. 448) notes that efforts to test the rational addiction model empirically have not been “entirely satisfactory”, and that at times findings of high rates of time preference have been found to be “implausible” by advocates of the rational addiction model.

\textsuperscript{49} Borrowing also from the original contributions of Spinnewyn (1981), Stigler and Becker (1977), and Becker and Murphy (1988).
In summary, while many arts demand studies have improved the performance of their estimated equations by including a one-year lagged dependent variable capturing the effect of past consumption on future consumption, that is not the only, or even necessarily the preferred, way to capture the dynamic effect of taste cultivation in arts demand analysis. Even if such a lagged variable is introduced, the underlying theoretical justification for its inclusion is a complex subject, with competing approaches having somewhat different implications, especially for arts management strategy and for the future growth of performing arts demand.

8. The product and geographic market problem: Substitutes and complements

In addition to the unresolved issue of whether the arts are price-inelastic luxury goods, Lévy-Garboua and Montmarquette (2003) have found no definitive evidence in the literature regarding close substitutes for the performing arts. While Withers (1980) estimated fairly strong cross-price elasticities for his “reading and recreation component of the CPI” as noted earlier, the t-statistics were not especially strong, and a time-series study of the aggregate performing arts in the United States is not well-adapted to capture localized competitive effects, or to distinguish among the sub-categories of the performing arts. Corning and Levy (2002) stated the dilemma perfectly when they observed that the most direct competitors of their three southern California theater venues are the Santa Barbara City College Theater Group, the Ensemble Theater Company, and Civic Light Opera, but “unfortunately insufficient price data were available to construct a useful variable” (Note 5, p. 234).50 They were thus forced to fall back on the “recreation component of the CPI” and found that none of those variations had any “measurable effect in any configuration and was dropped” (p. 227).

Some suggestive evidence on substitutes was developed by Lévy-Garboua and Montmarquette (1996), although no variable in their vast database really captured the price of substitutes. One variable reflected the perceived quality of available substitutes, and the relatively strong negative coefficients for this variable reflected a potentially broader product market than theater alone. This conclusion is also supported by their finding of a negative effect of regular magazine and journal reading on the frequency of live theater attendance, suggesting that those two forms of intellectual stimulation and entertainment are partial substitutes. Certainly, evidence regarding substitutes and complements need not stem solely from cross-price elasticities. Available quantities of potential substitutes like television programming or proxies reflecting technical improvements in the quality of such substitutes [e.g., Bonato, Gagliardi and Gorelli (1990), Pommerehne and Kirchgassner (1987)] may be revealing indicators of substitution relationships. Heilbrun

50 In a non-regression case-study of marketing strategies for the Los Angeles Music Center, Kaali-Nagy and Garrison (1972) identified eight potentially competing Southern California attractions: Marineland, Busch Gardens, Disneyland, Knott’s Berry Farm, the L.A. Zoo, the San Diego Zoo, Huntington Library and the L.A. County Museum.
B.A. Seaman (1997) found evidence that the popular arts have had notable negative effects on the high arts by examining the press coverage of both art forms over time in the *New York Times*.

Regarding cross-price evidence, it was not always presumed that arts and entertainment alternatives would be substitutes as opposed to complements for the high arts. Nevertheless, Felton’s (1992) explicit expression of neutrality regarding the expected signs of such variables is rare\(^{51}\) and most discussions of the empirical results reflect the expectation that gross substitution should dominate.\(^{52}\) For example, Ekelund and Ritenour (1999) were troubled by the unexpected negative coefficient on their variable for price of audio recordings, and stressed that it was statistically significant at “only” the 0.10 level.

While some version of movie price is the most popular cross-price choice,\(^{53}\) such variables have performed very poorly.\(^{54}\) In fact, it can be safely concluded that there is little empirical evidence that movies are effective substitutes for the performing arts. Only Withers (1980) and Gapinski (1986) had any real success in capturing positive cross-price effects for the performing arts, with Withers being the only remotely successful application of an aggregated recreation or entertainment price index. However, Felton (1992) generated evidence of a positive cross-price effect of symphony prices on attendances for large-budget but not small-budget ballet companies, and Goudriaan and de Kam (1983) found evidence of a positive effect of education and recreation expenditures on symphony, but not theater, attendance in their time-series model.

While Gapinski (1986) has understandably received all of the attention regarding cross-price evidence, it is noteworthy that his earlier attempt to find cross-price effects between cinema and recreation price indices and attendance at the Royal Shakespeare Company was not successful [Gapinski (1984)]; moreover his later study of resident versus tourist demand using the same 13 arts companies as in his 1986 study (and with a more inclusive variation of his 1986 substitute-price variables) also failed to generate any significant results. It is interesting that the Gapinski substitute prices that omitted any “intra-art form” components (1986) were more successful than the versions that

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51 She stated that “it was deemed equally likely that the two [alternative arts] experiences would be substitutes or complements” [Felton (1992, p. 4)].
52 At times, this expectation was clearly dependent on the particular measure being used. For example, in Greckel and Felton (1987) their “poor” measure of substitute prices was dropped (i.e. the entertainment component of the CPI), not only due to weak and statistically insignificant coefficients but because in most equations the “the sign of the coefficient was negative, indicating complementarity instead of substitution” (p. 64).
53 The enthusiasm for cinema prices in performing arts demand equations is not reciprocated in cinema demand analysis, where performing arts prices never appear. One possible reason, beyond mere measurement problems and data availability, is that while cinema and theater may appear to be excellent substitutes, the greater availability of cinema in all parts of a country compared to the more concentrated location of theater in only the major urban centers, may reduce the practical degree of such substitutability. Fernández Blanco and Baños Pino argued this for the case of Spain (1997, p. 62).
54 Only Touchstone (1980) came close to an expected result in her symphony equation and the coefficient in the opera equation was negative.
included such intra-art form prices (1988), although the two studies were not otherwise identical. Also, it is puzzling that citations of Gapinski (1986) almost always claim that he found strong evidence of substitution across artforms and stress the fact that his cross-price elasticities are greater than 2.0 in some cases, despite the fact that the cross-price elasticities are below 0.20 for four of his 13 companies, and 0.65 or lower for all but three of his companies (with two of the dance companies being as low as 0.21 and 0.28).55

Furthermore, Gapinski himself stressed that the two modern dance companies having those unusually high cross price elasticities were those with the lowest attendance and most “heavily contemporary” of all the companies in his study (p. 22), and that the “clearest pattern to emerge” was that “a price change by a single company alone has minor impact on a second company” and that the “greatest attendance response to a price maneuver occurs for the initiating firm itself” (p. 23), which is especially noteworthy given the quite inelastic own-price elasticities that average less than −0.30 for all art forms [see Gapinski (1986, Table 1)]. However, among the rarely discussed results are his projections of the effects of price changes by rivals acting together rather than unilaterally (p. 24), with one of his examples being a loss of 4800 patrons annually for one of his theaters if all other non-theater companies reduced their prices by 10 percent (an attendance decline that he argued is almost twice what could be generated by own-price changes by that particular theater itself).56 Nevertheless, the overall message of his path-breaking study is that price interdependencies among performing arts firms in specific geographic markets are potentially important, and that the focus should clearly be on further efforts to find evidence of the degree to which “the lively arts substitute for the lively arts”. To date, no successful replications or extensions of the Gapinski (1986) analysis have appeared.

There is little direct cross-price elasticity evidence regarding one aspect of complementary goods, i.e. the effect of higher prices for transportation (for given distances from the venue), parking, child care, dining and other components of the full price of an arts performance visit. The only exceptions are Carson and Mobilia (1989) and Lévy-Garboua and Montmarquette (1996), where some indirect evidence is presented that such costs (or perceived costs) can have negative effects on performing arts consumption.

The relative success of Gapinski (1986) in studying the particular geographic area of London raises an issue not normally addressed: what is the geographic scope of the market for the performing arts? Complementary television programming or other forms

55 The rare exception of a more accurate portrayal of the Gapinski (1986) results is Abbe-Decarroux (1994), who lamented his inability to find sufficient real income and substitute price data to include in his study of Geneva theater, but noted that various studies have found that performing arts demand is income insensitive, and that Gapinski (1986) also found that it is substitute-price insensitive as well (Note 6, p. 103).

56 It is possible, but unlikely, that all other firms would independently change price by roughly the same magnitude, and Seaman (2004) provides evidence that successful collusion, whether on price or other issues, has no doubt been rare in the performing arts.
of the media arts [Waterman, Schechter and Contractor (1991); Heilbrun (1993)], as well as touring arts companies [Escala
eria (2002)], can extend the geographic scope of the relevant market far beyond any localized geographical region.\textsuperscript{57} Furthermore, while Verhoeff (1992) confirmed the negative effect of distance on performing arts attendance [see also Zuzanek and Lee (1985)], he found surprising variability in the distances that people travel to performances in the Netherlands.

Despite this potential evidence that the geographic scope of effective performing arts markets need not be as localized as is generally assumed, Forrest, Grimes and Woods (2000) provide the most sophisticated econometric evidence regarding the important negative role of distance traveled in performing arts demand. They applied a zonal travel cost model to data regarding the Royal Exchange Theater in Manchester. Their price variability was derived from the notion that all potential consumers faced different effective prices due to the varying costs of traveling to the venue. Using distance as a proxy for travel costs, they also assumed that an increase of 2.66 km is equivalent to an increase of £1 in the cost of attendance, and that symmetrically a £1 increase in ticket prices is the equivalent of shifting the population of each zone outwards from the theater by 2.66 km. They then calculated for each of 20 zones the change in total visitor numbers with respect to a change in ticket price, and derived a price elasticity of demand of $-1.24$, which they interpreted as being reasonably close to the revenue-maximizing pricing strategy when marginal cost in the non-capacity-constrained case is nearly zero. Interestingly, calculations of elasticity for individual zones (with prices different from the mean) showed inelastic demand in areas with the largest values for their variable controlling for educational level but elastic demand elsewhere.\textsuperscript{58}

Finally, there is a small literature that addresses the substitutes/complements issue not by inserting the prices or quantities of consumption alternatives into a regression equation on arts attendance, but by examining the correlation between the estimation errors corresponding to consumers’ demand equations for different types of entertainment in an effort to answer the question: “Are high arts and popular arts (or sports) consumers the same people?” These studies by Prieto-Rodríguez and Fernández-Blanco (2000) regarding classical and popular music, and Fernandez-Blanco and Prieto-Rodriguez (2000) and Montgomery and Robinson (2005) regarding live sports and the live arts, generate some evidence that the high and low arts may be complements instead of substitutes, but provide conflicting results regarding the relationship between arts and sports consumption [Seaman (2005, pp. 120–122)].

\textsuperscript{57} Seaman (2004) reviews this evidence.

\textsuperscript{58} They also addressed the issue of the possible endogeneity of residential location, whereby people with strong arts demands would locate in close proximity to arts venues. While it is known that arts attendance is higher for those living in urban areas or in locations with relatively large populations, that issue is rarely addressed as a simultaneity problem. Bajic (1985) also found some evidence of theater location being a factor in the housing choices of those with especially strong theater demand in Toronto, but this result is hardly typical of arts consumers, much less the general population.
9. The product quality problem

9.1. Modeling quality

Throsby’s attempt to address the quality issue in arts demand studies (1990; a reprint of a 1982 paper) represented an important step in correcting a prior mis-specification of arts demand equations. He developed the distinction between an objective measure of individual plays (based on repertoire classification), and so-called technical variables (standards of source material, production, acting, and design) that actually depended upon the subjective assessments of press reviews. There is another critical distinction in the arts quality literature: whether the primary focus is on a time-series or pooled analysis of the quality of a large number of performances by a small group of arts organizations, or on the overall quality of a large number of arts organizations themselves. Two things are clear. First, the most studied artform by far has been theater [Throsby (1990), Jenkins and Austen-Smith (1987), Dobson and West (1989), Abbé-Decarroux (1994), Corning and Levy (2002), and Urrutia-guer (2002), with Krebs and Pommerehne (1995), a mixed case that primarily focused on theater but with a database that also includes opera and other art forms]. Second, the overwhelming focus has been on attendance per performance related to quality variables applied to the individual repertoire as opposed to the overall quality of arts organizations. Interestingly, the few studies that did not focus on theater [Greckel and Felton (1987), Felton (1989), and Luksetic and Lange (1995)] primarily used non-Throsby type variables that did apply to the organizations themselves (see below).

The Throsby (1990) model postulated a subsidized non-profit theater management choosing price, season length, and quality attributes of its productions, so as to maximize a managerial utility function containing those quality attributes and the percentage of seats in its venue that are filled with paying customers. Paid attendance demand is a straightforward function of average price per seat, season length, venue capacity, and an $n$-vector of quality characteristics. Data were available from three Sydney theater companies. The key innovations were in generating the variables to include in the quality characteristics vector. Five characteristics $q_1, \ldots, q_5$ were defined as repertoire classification, standard of source material, standard of production, standard of acting, and standard of design, respectively. The repertoire classification variable, $q_1$ could be defined using objective criteria based on four groupings of plays that would be essentially non-controversial: $A =$ a “classic” written before 1900; $B =$ written after 1900 by a well-known author (from the audience perspective); $C =$ written after 1900 by little or unknown authors (from the audience perspective); $D =$ entertainment, revue, and musical. Class D was defined as the omitted benchmark if all three other repertoire classifications enter the equation, and a dummy variable was created for each of the A, B, and C groupings which was set $= 1$ if a play fell into that particular class, and 0 if it did not.

The development of variables $q_2$ through $q_5$ was more challenging and was based on an assessment of the “subjective” opinion of press reviews defined in terms of how
well any play met high standards defined over the four “technical” dimensions listed above. A cardinal scale 1 to 5 was created. Importantly, he also summed the \( q_2 \) through \( q_5 \) variables to obtain a single “composite standard” (p. 73). This was rationalized as an attempt to overcome some of the variability in individual assessments, but can be justified on its own merits as reflecting something akin to the overall impression that a play would make on a viewer who may not even be thinking in terms of the four separate criteria. This entirely separate variable (defined as “sum” of source material (Mat), production (Prod), acting (Act) and design (Set) are the technical standards) was substituted for the individual \( q_i \), for \( i = 2, \ldots, 5 \) was entered as dummies in the alternative specification of the model for each of the three theaters. The results are reported in Table 2, although coefficients are rounded to two decimals and the column headings are slightly modified compared to the original. Except for the repertoire dummies, the double-log specification was used.

Since only the Nimrod theater (theater 2) offered plays in all three of the “non-popular” (i.e. class D) repertoire classifications entered as dummies, its results regarding those three types of plays should be interpreted relative to entertainment, revue and musical plays. Its audiences revealed a strong distaste for class C plays (those by little known authors), but neither classics nor twentieth century plays by well-known authors had significant effects. The type of play also had no effect on Ensemble audiences (theater 1), but Old Tote audiences reacted favorably to both classics and well-

Table 2
Demand function estimates for three Sydney companies, 1974–1978

<table>
<thead>
<tr>
<th>T</th>
<th>Con</th>
<th>Price</th>
<th>Cap</th>
<th>Repertoire class</th>
<th>Technical standard</th>
<th>( \sum q_i )</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl A</td>
<td>Cl B</td>
<td>Cl C</td>
<td>Mat</td>
</tr>
<tr>
<td>1</td>
<td>1.67</td>
<td>−0.41</td>
<td>0.04</td>
<td>0.18</td>
<td>−0.09</td>
<td>0.90</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>(3.2)</td>
<td>(−0.7)</td>
<td>(0.7)</td>
<td>(0.7)</td>
<td>(−0.4)</td>
<td>(2.2)</td>
<td>(0.6)</td>
</tr>
<tr>
<td>1</td>
<td>1.14</td>
<td>−0.20</td>
<td>0.03</td>
<td>0.12</td>
<td>0.20</td>
<td>0.20</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>(2.0)</td>
<td>(−0.3)</td>
<td>(0.5)</td>
<td>(0.8)</td>
<td>(1.1)</td>
<td>(1.1)</td>
<td>(1.8)</td>
</tr>
<tr>
<td>2</td>
<td>−0.85</td>
<td>0.66</td>
<td>0.92</td>
<td>−0.01</td>
<td>−0.04</td>
<td>−0.12</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>(3.3)</td>
<td>(1.9)</td>
<td>(11.4)</td>
<td>(−0.1)</td>
<td>(0.7)</td>
<td>(2.2)</td>
<td>(2.1)</td>
</tr>
<tr>
<td>2</td>
<td>−1.38</td>
<td>0.58</td>
<td>0.94</td>
<td>−0.04</td>
<td>−0.05</td>
<td>−0.12</td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>(5.1)</td>
<td>(1.9)</td>
<td>(13.2)</td>
<td>(0.6)</td>
<td>(0.9)</td>
<td>(2.3)</td>
<td>(4.2)</td>
</tr>
<tr>
<td>3</td>
<td>0.43</td>
<td>0.30</td>
<td>0.63</td>
<td>0.06</td>
<td>0.07</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>(1.3)</td>
<td>(0.8)</td>
<td>(5.9)</td>
<td>(1.2)</td>
<td>(1.6)</td>
<td>(0.4)</td>
<td>(0.4)</td>
</tr>
<tr>
<td>3</td>
<td>0.31</td>
<td>0.28</td>
<td>0.63</td>
<td>0.06</td>
<td>0.07</td>
<td>0.21</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>(0.9)</td>
<td>(0.8)</td>
<td>(6.2)</td>
<td>(1.7)</td>
<td>(1.8)</td>
<td>(1.3)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Throsby (1990, Table 1).
Notes: Theater (T) 1 = Ensemble (180 seat theater-in-the-round in a converted boat shed in a harbor-side suburb); 2 = Nimrod (300 seat converted factory in inner suburbs); and 3 = Old Tote (principal state drama company in several venues; already was closed when the study was completed); Con = constant term; Cap = venue capacity; Cl (class) A, B and C are as defined in the text prior to the table; and the technical standards of source material (Mat), production (Prod), acting (Act) and design (Set) are the \( q_2 \) through \( q_5 \) variables. Absolute values of the t-statistics are in parentheses.
known plays relative to those by little-known authors (type C, the omitted base case for theater 3). Thus, there is some evidence that the type of play is an important variable to include in theater demand equations.

There were also mixed but generally supportive results regarding the more subjective rankings of the four technical performance criteria. The most noteworthy finding was that for all three theaters the aggregated quality variable generated much more statistical significance in the positive coefficient estimates than for each quality variable entered separately (although still not significant for theater 3, the Old Tote). The weak results for the Old Tote possibly reflected the high proportion of subscription seats sold by that theater, producing what Throsby called a “captive audience” effect (p. 75).59 Considered individually, the standard of acting had by far the strongest effect on the Ensemble theater (theater 1), with set design dominating audience choices for the Nimrod (theater 2). Throsby found this first result fully consistent with the Ensemble’s known commitment to acting (p. 75). Taken as a whole, these “tentative and qualified” (p. 81) findings have been viewed as confirmation of the importance of controlling for quality in arts demand studies.60

Following Throsby (1990), the inclusion of some form of both objective and subjective measures of program classification into arts demand studies has become relatively common, although the results continue to be mixed. These approaches and results are reported below in the following sections.

9.2. Studies using objective quality criteria

We review here a number of studies that have assessed quality on the basis of objectively observable criteria, beginning with that of Jenkins and Austen-Smith (1987) who had only limited success in finding a positive effect on English provincial theater attendance of “less esoteric” programming (defined as comedies, thrillers and musicals, in contrast to so-called serious drama). While the effect was positive and statistically significant, it was not especially economically significant. They estimated that an increase in the mix of less esoteric programming from 50 percent to 60 percent would increase demand by only one percent. On the other hand Greckel and Felton (1987) did not attempt to characterize the content of programs, but included even more objective measures without success. Their dummy variable to capture the shift of the Louisville Symphony

59 This is reminiscent of the Hjorth-Andersen (1992) suggestion that if subscription sales dominate total ticket sales (as he found in his forecasting equations for Danish theater), the financial success of a whole season is known before it even starts.

60 In addition to the widely varying $R^2$s for the three equations, the primary discordant note was in the behavior of the ticket price coefficients, not statistically significant and with conflicting signs for the Ensemble and the Old Tote, but positive and significant for the Nimrod. Throsby suggested that this reflected a demand shift for the Nimrod during a time when the real price of admission was only gently rising due to the Nimrod’s policy of keeping prices low to encourage audience development rather than commercial success [Throsby (1990, p. 75)]. This justification is an extension to the positive elasticity case of the downward bias in estimated negative price elasticities created by low pricing strategies.
Orchestra to a full-time orchestra, and variables for the number of programs, and the number of performances (both intended to reflect desirable product variety) failed and were dropped from their reported equations. Two variables that did work well were idiosyncratic to the Louisville Orchestra: (1) a dummy variable to capture the effect of an “unpopular conductor” (i.e. Jorge Mester) was introduced to assess the negative impacts of the frequent absences of this primary conductor during his final two years, and the unpopularity of Akiro Endo, his successor (the authors surprisingly identify an estimated elasticity of $-0.30$ despite this being a dummy variable); and (2) a concert hall capacity variable with the unique interpretation of capturing the positive effect of the shift of the orchestra to new and far superior facilities that also included a larger hall. In subsequent studies, Dobson and West (1989) found no significant effect on Atlanta theater audiences of the type of play or the day of the week of the performance; similarly, Felton (1989) found statistical significance for her opera popularity ratings variable in only one of her opera company equations (the Kentucky Opera Association), and concluded that in other cities programmatic content had little effect on subscriber attendance. Luksetich and Lange (1995) had no success with their attempt to link total expenditure per symphony performance to attendance via a quality argument.

While Abbe-Decarroux (1994) included a variable measuring subjective press reviews, he perhaps followed Throsby (1990) as closely as anyone in also introducing eight quite objective dummy variables (although not aggregating them into a single variable). He also estimated his seven-year (64 productions) Geneva theater demand function for both full-price and reduced price audiences (as well as reporting the total demand equation). Some variables performed well; others did not. “Home productions” (those produced by the institution itself) had significantly negative effects on per performance admissions (explained as being due to the higher frequency of such plays being performed), while well-known authors, producers and casts had separately positive and generally statistically significant effects across all equations. But surprisingly, the fame of the play, and whether it was a classic (written before 1900) or a modern play (after 1990; deceased author) had no real effect on either audience segment, but audiences clearly rewarded novelty, with “atypical” plays (circus, revue, collection creation or other) having strongly positive effects on per performance attendance.

Krebs and Pommerehne (1995) considered but rejected various quality measures, and tried to capture the popularity of various arts productions by measuring the “share of productions with many performances out of all performances” (p. 25). Specifically, they constructed a proxy for highbrow versus lowbrow theater productions by measuring the “ratio of works with more than 75 performances to all works played in a season”, which they viewed as a proxy for more popular lowbrow productions that would survive longer than highbrow plays. Given the recognized weaknesses of this construction, it is remarkable that this variable performed fairly well – a positive coefficient, although not quite statistically significant (unless income is omitted from the equation). The derived “lowbrow” elasticity of arts demand implied that a 10 percent increase in the share of such works would increase paid attendance per capita of the population by one percent. This lowbrow inelasticity result is consistent with the low “less-esoteric-programming”
elasticity result in Jenkins and Austen-Smith (1987) and suggests that even when this dimension of repertoire quality has an effect on attendance, it is not as high as has been generally expected. However, since the Abbé-Decarroux (1994) definition of “atypical play” seems to include some more popular rather than eccentric content, its strong positive effect in that study is potential counter-evidence.

A large number of objective quality variables were introduced by Corning and Levy (2002) in their study of demand for live theater with market segmentation and seasonality. They found evidence that programmatic content had limited effects on single-ticket theater attendance, varying notably across individual theaters and strongest for the unique case of the musical *Tommy*, which in the case of one Southern California theater location would increase per performance attendance by over 200 in contrast to a performance of Shakespeare ceteris paribus (p. 230). They also found more evidence than did Dobson and West (1989) that scheduling has some effect on attendance, with the weekend dummy variable having the strongest positive effect across all venues. However, their seasonality results were generally weak. Their most fascinating objective variable is one that would seem to pre-judge the issue: “Flop” was a dummy variable = 1 when the average total attendance for a play at its first location prior to its shifting to another venue was less than 50 percent of capacity; remarkably, the coefficient on this variable was positive in two venue equations (statistically significant in one) and only negative and significant in the outdoor summer season venue. The fact that seemingly clear evidence that a play is a failure cannot reliably reveal later negative effects on attendance may be the best evidence of the challenge in capturing the effects of quality in arts demand studies.

9.3. Studies using subjective quality assessments

In contrast to the above efforts to capture objective quality effects, some subsequent studies focused on the determination of subjective perceptions of quality, typically focusing on the role that various expert critics have on the perceptions of the lay public. For example, Abbé-Decarroux (1994) supplemented his four repertoire and four “fame” (author, play, producer, cast) objective variables with a qualitative press review variable scaled nearly identically to Throsby (1990), adding a sixth category for “excellent”. This variable was positive and highly statistically significant in both full-price and reduced-price equations. Corning and Levy (2002) also supplemented their inventory of programmatic, scheduling and seasonal variables with a newspaper review variable on a five-point scale [adding some additional detail to the parsimonious Throsby (1990) ratings; their Table II, p. 227]. Due to some format changes in the two publications used in their analysis, some productions were not reviewed at all, which was registered with a “no-review” variable. The quality of such press reviews had a positive and statistically significant effect on per performance attendance in only one case (the summer outdoor festival venue). Interestingly, the total absence of any review of a production actually had a positive effect in each of the three venue equations, with reasonably high although not statistically significant t-statistics.
9.4. An extended model

Urrutia-guer (2002) has provided the most important extension of the Throsby (1990) analysis. He modified the Throsby model in two ways, one somewhat technical, but the other more important conceptually. The technical adjustment was in changing the dependent variable from a measurement of seasonal attendance for each year to per performance attendance, by dividing the Throsby dependent variable by the number of performances. Urrutia-guer justified this in his case as necessary to avoid heterogeneity in the size of theatrical institutions among his much larger database of 87–104 theaters, and to reduce the risks of heteroskedasticity (p. 187). More fundamentally, he noted that when he applied his model to the demand for individual shows in 1995, the adjusted $R^2$ was quite low (about 0.13; the Throsby $R^2$s ranged from 0.21 to 0.71). He suggested that the weakness of this result should not be surprising inasmuch as the theater itself rather than just individual shows is a “much more appropriate” level at which to examine variance in demand, which can be caused by an organization’s program, auditorium comfort and the overall image of an individual theater.

Urrutia-guer’s four repertoire classifications were updated variations of Throsby (1990) adapted to France. An important modification was required to make the resulting dummy variables applicable to a theater rather than an individual play. A theater-reviews variable was based on an analysis of the opinions in three publications, again aggregated to apply to an individual theater rather than just specific performances. The final step was to recognize that unambiguous reviews have more impact than those with “nuances”, and any dummy variables entered into the estimating equation should reflect this. Urrutia-guer also developed a “weak and high centrality” measure to capture the potential effects of a unique quality proxy in France: the weight in a theater’s programs of shows produced by what he calls “directors-cum-managers”. Finally, assuming that public recognition of a theater via tax-financed subsidies is a quality proxy, he specified a dummy with value $= 1$ if the yearly growth of subsidies was more than 8 percent, and $= 0$ otherwise. Two such dummies were defined, one for state and one for local subsidies.

Despite the sophisticated technical innovations in constructing the drama review and centrality dummy variables, and the important conceptual shift toward a focus on the theater rather than the individual play, Urrutia-guer (2002) originally had limited success in generating significant results for his quality variables, an outcome consistent with the frequently mixed experience of prior studies. So he went on to test the hypothesis that different portions of theater audiences have contrasting perceptions of reputation, especially in how they weigh the reputations of drama critics and those of artistic directors. Thus, the full theater sample was segmented into two groups: a Group I of 40 institutions for which the audience shares the scale of judgments of drama critics and a Group II of 47 institutions whose audience have more trust in the artistic reputation of directors-cum-managers and who either ignore or do not share the judgments of theater critics. Therefore, the signs on certain estimated quality coefficients were expected to differ between Group I and Group II regressions.
The effect of this disaggregation into two groups was dramatic. The adjusted $R^2$ for both groups was very high (>0.824). While the price coefficient was enigmatic, positive in both equations and strongly significant for Group I, and only one objective repertoire quality variable was significant (strongly negative for foreign contemporary plays for Group I), the other quality variables generally performed well. Also, consistent with other studies using a one-year lagged dependent variable, that effect was strongly positive in both equations, as is the venue capacity coefficient (although stronger for Group I). The regressions confirmed the expected opposition of the signs on the reputation variables for the media and art director, except for the weak centrality variable, with both groups have highly significant but opposite coefficients on the drama-reviews variables. This suggests that the effect of drama critics can be negative as well as positive, at least for some segments of the audience, which is a more encouraging result than the lack of significance that such variables have sometimes had in other studies.61

Despite the delay relative to the appearance of Throsby’s work (which was first published in 1983), Urrutiaguer (2002) significantly advances our understanding of the arts quality issue, even if he did not incorporate Throsby’s aggregated composite of different technical standards variable into his extensive analysis.

10. The role of socioeconomic factors versus life-style determinants of arts demand

10.1. Lifestyle determinants

Andreasen and Belk (1980, 1981) are best known for asserting that life-style factors, attitudes and socialization to the arts are more reliable predictors of attendance among “marginal attenders” (at least for theater and symphony in the southern US) than are demographic and socioeconomic variables. A notable feature of Andreasen and Belk’s provocative assertion is that it was not only founded upon the derivation of statistically significant univariate correlations of 56 independent variables with the likelihood of attendance, but was further confirmed using step-wise regression analysis. As expected, multicollinearity problems were severe among their 56 independent variables that included all standard socioeconomic determinants (education, gender, income, occupation, and age), but also variables as diverse as six “general life-style” dimensions (e.g., optimism/hedonism and traditionalism), six “leisure life-style” group characterizations (e.g., passive homebody, culture patron, inner-directed self-sufficient), life-cycle variables, and various socialization proxies.62 As a result, only six variables in the step-wise regressions were found to add significantly (at the 0.05 level) to the prediction of

61 Including Urrutiaguer (2002) prior to segmenting the theater sample by audience reputation perceptions.
62 Levantal (1989) included a related list of six “psychographic factors” including “eclecticism” and “independence of opinion” along with “determination to see a particular play”.

theater attendance and five to the prediction of symphony attendance, with only modest adjusted $R^2$ values of 0.279 and 0.289, respectively [Andreasen and Belk (1980, Table 2)].

However, despite those limitations the essential results were striking: not one of those standard socioeconomic variables was a significant predictor of future attendance when controlling for attitude, and general and specific life-style factors. Instead, what mattered most as positive predictors of future attendance in the theater equation (based on the standardized beta weights) were: attitude toward attending the theater; being a “culture patron”, a leisure life-style characteristic; interest in live theater when growing up; and theater attendance during the past year. The most important negative predictors were two of the “general” life-style characteristics: “traditionalism”; and “self-confidence/opinion leadership”. There were no significant negative predictors of symphony attendance, but quite similar positive predictors: attitude toward attending the symphony; culture patron; “socially active”, a leisure life-style trait; interest in classical music when growing up; and symphony attendance during the past year. While these results again confirm the importance of previous attendance as a predictor of current attendance, the elimination of variables like education, income and age as significant independent variables was novel.

But have those findings been replicated? Some studies have cited important socialization effects within the family [e.g., Ganzeboom (1989), van Eijck (1997)], and others have carefully distinguished between childhood arts experiences with parents in contrast to those obtained in school [e.g., Abbé-Decarroux (1995), Morrison and West (1986)]. Furthermore, among the determinants used by Lévy-Garboua and Montmarquette (1996) were such attitudinal variables as “appreciates humanity” (which intriguingly had a negative effect on the probability and frequency of attending the theater, but a positive effect on the “satisfaction” derived from attending; Table 1, p. 36). And when one adds variables from non-regression based studies, the variety of such factors expands further. A mere sampling would include: the ticket purchasing habits of friends [Bamossy and Semenik (1981), Kolb (1997)]; years spent residing in the geographical area being studied [Ryan and Weinberg (1978)]; divorced versus widowed status in addition to the more standard single versus married designations, as well as who within the family makes the decision to attend various types of entertainment events [Kaal-Nagy and Garrison (1972), and Upright (2004)]; and networking among women [Kane (2004)].

However, there is no real evidence that the Andreasen and Belk (1980) conclusion regarding the dominance of the socialization “error-term” variables over the other standard demand variables has been replicated. There are three reasons. First, even Andreasen and Belk (1980) found that of their daunting list of non-traditional variables, only a very few survived the step-wise regression pruning process (as described above). Second, other studies of “socialization”-type variables have found that income,
education and age are not eliminated from those equations and often perform quite well [DiMaggio and Ostrower (1990); Lewis and Seaman (2004)]. Finally, from the purely limited perspective of explaining the variance in the dependent variable, extremely parsimonious time-series or pooled studies sometimes do quite well without adding such so-called taste-adjusting variables.

10.2. Racial differences

While race has been a surveyed characteristic of the SPPA since 1982, race and ethnicity have been nearly absent from econometric arts demand studies, with only Dobson and West (1989), Gray (2003), and Lewis and Seaman (2004) as exceptions. It is also difficult to find examples using non-US data, with Trienekens (2002) being a rare exception (i.e. the Netherlands).

Dobson and West (1989) found “ethnic background” to have a modestly negative effect on Atlanta theater attendance; Lewis and Seaman (2004) found mixed results, with “Black” being a negative and statistically significant determinant of classical music attendance, but with competing and not statistically significant effects on arts museum (negative) and dance (positive) attendance. Gray’s (2003) logistic regression results based on the 1997 SPPA are of interest inasmuch as, after adjusting for age, income, education, gender, work hours, and music and art lessons, the “Black” variable coefficient was statistically significant and negative only for classical music, opera, and ballet, while being positive for jazz, musical theater, non-musical theater, dance, and museum. Also, he reported ceteris paribus positive and statistically significant coefficients for “Hispanic” across all categories, negative “Asian” coefficients for all arts categories except dance and museum, and negative “Indian” coefficients for all arts categories except opera and musical theater. While not all of those coefficients were economically significant (e.g., six coefficients were below 0.10 in absolute value), no other study incorporated that degree of ethnic variety.

The surprisingly weak and mixed performance of racial/ethnic variables in these few studies is noteworthy in light of DiMaggio and Ostrower’s (1990) conclusion that “given the degree of racial oppression and exclusion to which black Americans have been subjected, they participate in the arts at rates and in ways remarkably similar to those of white Americans”, a pattern they call “differentiation without segmentation” (p. 772). Utilizing the 1982 SPPA as the data source, DiMaggio and Ostrower posed the key question: since whites are more likely than blacks to exhibit key characteristics linked to demand for the performing arts (higher levels of education, income and prestigious occupations), is there really an independent role for race in explaining the lower arts participation rates of blacks that are revealed by survey data? The four major results of their empirical analysis were:

- the unique negative effect of race on Euro-American high culture arts participation was modest, but statistically significant [roughly consistent with Gray (2003)];

64 The unique methodological features of DiMaggio and Ostrower (1990) are discussed in Seaman (2005).
• race effects were stronger for arts consumption than for arts production behavior, and stronger for public arts consumption than for private arts consumption via television watching, where in fact the racial effect was nearly absent—a fascinating result consistent with their view that racial discrimination may adversely affect public but not private participation in the arts and that arts consumption but not production is affected by “status competition”;
• being black had strong positive effects on both attendance and enjoyment measures for the non-European-based artforms of jazz, soul, blues and R&B, confirming the obvious point that viewing black arts participation rates as relatively low depends in large part on one’s definition of the arts; and
• the behavior of interaction terms with race and the other control variables was complex and highly variable.

Finally, DiMaggio and Ostrower conducted a detailed analysis of two hypotheses that might explain the remaining racial differences in arts participation. These were a “cultural convergence” model by which any such differences would be expected to diminish with increased interracial peer contact, and a “cultural resistance” model by which increased black/white economic competition would create opportunities for younger, well-educated blacks to embrace minority cultural norms [e.g., (1990, p. 773)]. However, despite their best efforts, they eventually found little systematic evidence to support either of these perspectives.

10.3. Sexual orientation

The Lewis and Seaman (2004) study of the role of sexual orientation in affecting arts demand relied upon the 1993 and 1998 US General Social Survey (GSS) for data. They confronted the challenging problem of defining sexual orientation by using the self-reported number of male and female sex partners since age 18, and whether one’s recent sex partners have been male, female or both. While they experimented with a variety of definitions (all yielding similar results), they chose the one yielding the largest sample size (5 percent, or 180 of 2188 respondents) in order to reduce standard errors. They coded the LGB (lesbian, gay and bisexual) variable as 1 for those who reported at least one same-sex partner since their 18th birthday, and 0 for everyone else.

Just as a large part of racial arts consumption differences may actually reflect educational, occupational and income disparities, similar control variable problems (along with urban location factors and differential family obligations) complicate the effort to isolate a unique role for sexual orientation. The descriptive data used by Lewis

65 While there is evidence that LGB’s are more educated, urbanized, and more likely to be childless than heterosexuals, the common notion that their average incomes are also higher is due largely to non-representative samples of wealthy gay men and lesbians. In fact, controlling for education, gay men earn 15 to 30 percent less than straight men of the same age, and the evidence on lesbian versus heterosexual women is mixed. Yet, there is indeed evidence that gay male couples have higher income (especially disposable income) than married straight couples, with lesbian couple earnings the lowest of the three groups; see Lewis and Seaman (2004, p. 525 and related citations).
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and Seaman yielded powerfully suggestive results. With no demographic or other controls, substantially higher percentages of LGBs compared to straight respondents had visited or attended an art museum/gallery, or ballet, dance, classical music or opera performance in the prior year, yielding attendance differentials of between 16 and 19 percentage points, with LGBs being about twice as likely to have attended a classical music or dance performance and almost three times as likely to have attended a museum, musical and dance performance, i.e. 17 percent compared to 6 percent [Lewis and Seaman (2004, p. 529)]. Even after controlling for demographic and other variables, the percentage differences between LGB and heterosexual attendance patterns dropped only to 12 (museum), 10 (dance) and 14 percent (music) from the unadjusted respective differences of 17, 16 and 19 percent, respectively (p. 531). The logistic consumption regression equations estimated by Lewis and Seaman revealed strong and statistically significant positive effects on attendance due to being LGB, higher education, higher parents’ education, higher income, and living in a city over 50,000 population, with a moderately positive effect due to being Jewish (but not statistically significant in the classical music equation). Being a fundamentalist Protestant had a modestly negative and significant effect for dance performances (and negative but not significant for museums, and almost dropping out of the classical music equation entirely).

As with DiMaggio and Ostrower (1990), after establishing the unique role of sexual orientation, Lewis and Seaman (2004) confronted a similarly frustrating problem in explaining why it exists. Little compelling evidence was found from supplemental tests for any of four explanations: pure demographics; an innate “gay affinity for the arts”, tested by also examining arts production behavior such as “make art, play music, perform live or identity as a professional artist”; a reaction to the historical repression of homosexuality; and an ongoing more welcoming environment for LGBs in arts venues than in other public entertainment environments – an explanation that was at least weakly supported.

Summarizing the various studies discussed above, we can conclude that the Andersen and Belk (1980) hypothesis that “life-style” and socialization-type variables eliminate from significance the standard socioeconomic variables of education, income, age and occupation (not to mention own- and cross-price effects) has found little support from subsequent studies. However, any full understanding of the demand for the performing arts clearly cannot ignore this larger variety of complex determinants.

11. Data problems

One of the most common laments of researchers in the economics of art and culture deals with the inadequacies of data. Historically, cultural economists may have had

66 Their dependent variable = 1 for “attended” and 0 for “did not attend” in each of three equations for art museum, dance performance, and classical music. Results did not change using ordered logit when the three dummy variables were summed to get a proxy for “intensity of arts attendance”.

67 Luksetich and Lange (1995) observed that in all of their earlier work on symphony orchestras they had been severely constrained by data limitations, including an absence of usable data for more than one year.
a strong case that their job was made especially challenging by the traditional lack of business savvy among artists and arts organizations that hindered coherent data collection and reporting, together with the tedious but perennial question “what is art?”. Yet without doubt, the seminal impact of Baumol and Bown (1966) was in large part the result of their uniquely rich database in addition to the provocative quality of their analysis. Even then, empirical work in the performing arts in the US was nearly impossible prior to the Ford Foundation’s extensive survey (1974), followed by another by the National Research Center of the Arts, Inc. (1976); their surveys stimulated efforts in other countries to further improve the quality of their own data. It is therefore not surprising that a characteristic feature of many topics in the arts economics literature has been the degree to which basic data gathering and attempts to develop consistent standards of measurement have competed for attention with modeling and analysis.

Conditions have certainly improved in terms of government-financed studies such as those done by the venerable Arts Council of Great Britain but also extending to other countries. Even in the United States the NEA Research Division, despite desperate under-funding, has frequently generated data that have become international benchmarks, as with the Surveys of Public Participation in the Arts. These government efforts have been supplemented by an increasingly rich array of private non-profit and university centers devoted to arts research. Furthermore, despite the frustrations of obtaining reliable data from arts organizations, it is also common for authors of arts demand studies to cite the unusual degree of cooperation (sometimes after failed efforts) given to them by individual or groups of arts organizations. Examples include Felton (1989) paying homage to Opera America for rescuing her after receiving assistance from only five of 20 personally contacted opera companies; Schimmelpfennig (1997) getting unusual cooperation from the Royal Opera House Covent Garden; and Abbé-Decarroux and Grin (1992) working closely with three major cultural organizations in Geneva.

One dilemma that is not unique to demand studies in the arts is that a particular data set or research agenda that may overcome one type of missing information problem, or that may address one deficiency in previous research, may be incapable of incorporating other critical demand-determining variables whose exclusion is undesirable in a fully specified model. For example, Globerman and Book (1977) used audience survey data and an explicit household production model to try to improve the estimate of the income elasticity of demand by directly incorporating the role of education in increasing productivity in the consumption of arts activities. However, they lacked ticket price data and “borrowed” long-run price elasticity results from Houthakker and Taylor (1970) to draw certain inferences about the relative productive effect of education on the arts.

However, owing to the generosity of the American Symphony Orchestra League in providing them with truly extensive data on a proprietary basis, they were now able to seriously address those limitations (p. 51).

68 In addition to the descriptive data published by Ford Foundation (1974), more extensive Ford data were also critical for some econometric demand analysis [e.g., Touchstone (1980), Gapinski (1981)].

69 This phenomenon is especially notable in the United States, where the more modest governmental role in arts financing and policy-making has created a void to be filled by such organizations.
compared to other activities in the aggregate. Lange and Luksetich (1984) obtained data that allowed them to derive price elasticities that varied across three different types of orchestras, but the lack of consumer income data in their regressions raised questions as to the reliability of those results.70

Other examples of studies affected by data limitations include:

- Throsby (1990), who addressed the absence of systematic quality variables in previous arts demand studies, but was missing income as well as education data in his analysis;
- Forrest, Grimes and Woods (2000), who effectively incorporated distance traveled into their theater demand analysis but were able to use only education and age as control variables in their equations;
- Schimmelpfennig (1997), who confronted the issue of price elasticity variations as a function of differing seating sections in a ballet theater, but had no other control variables and was forced to use a quite restrictive assumption about product homogeneity across two different ballets;71
- Lévy-Garboua and Montmarquette (1996), who provided an unusually rich analytical framework to assess “learning-by-consuming”, supplemented by a database with 58 independent variables, that did not allow the direct measurement of either consumer income or arts admission prices; and
- Lewis and Seaman (2004), who were able to use unique data from the US General Social Survey to address the previously ignored topic of sexual orientation (and religious affiliation) in arts demand controlling for many other demand determining variables, but could not incorporate any arts pricing or quality variables given that particular data source.

Thus, despite the notable improvements in data availability and quality, a weakness of empirical performing arts demand studies has been the difficulty of any one study having adequate measures of all of the critical determining variables.

12. Conclusions

Several reasonably clear conclusions can be drawn from the research reviewed in this chapter, including the following:

70 For example, see Green, Hassan and Johnson (1992) on the bias created by omitting income in demand function estimation.

71 The Royal Ballet Summer Season that was examined consisted of 16 performances (nine of which included in the estimations) of two full-length works (for 1995, Giselle and Sleeping Beauty). Schimmelpfennig used the highest prices for (eventually) three seating categories. Such prices were the same for each performance of any one ballet, but that price schedule was higher for Sleeping Beauty than for Giselle. Therefore, he was forced to assume that both ballets are homogeneous in order to get the necessary price variation across his observations, an assumption that he recognized (p. 121) was contradicted by the very existence of two different price schedules, but that he viewed as acceptable for his purposes of examining the relationship between actual prices and revenue-maximizing prices.
• Income elasticities of demand for the arts cannot be adequately estimated without separating the real income effect from the opportunity cost of leisure pure substitution effect;
• Quality matters, although the mixed results from various objective and subjective measures suggest that we are not yet sure how best to capture this important determinant of variations in arts attendance and participation;
• Some version of dynamics in consumption, be it passive inertia, learning-by-consuming, or the more complex rational addiction, should be incorporated to better understand arts demand, especially because these distinct notions have quite different implications for the optimal marketing strategies of arts managers;
• The survey study evidence favoring formal education as the most powerful determinant of variations in arts attendance has not been reliably strengthened by regression analysis.

Nevertheless is hard to dispute the Lévy-Garboua and Montmarquette (2003) assessment that critical issues remain unresolved in the performing arts demand literature. This is especially the case regarding the robustness and interpretation of the price inelasticity “consensus”, the limited evidence regarding substitutes and complements, and the complex relative roles of the traditional socioeconomic demand-determining variables and the vast array of specialized lifestyle and socialization factors (or non-traditional socioeconomic variables). Regarding research improvements, Lévy-Garboua’s and Montmarquette’s faith in the importance of well-defined taste cultivation models, larger databases and more sophisticated econometric modeling in improving our empirical models is understandable, but such analytical improvements to date have largely failed to generate substantial changes in the results or new insights about performing arts demand. In the case of sample sizes, for example, despite the fact that some of the studies discussed in this chapter have used very large databases, the nature and validity of some key results in arts demand analysis do not show any systematic relationship to the sample sizes from which they were derived, ceteris paribus. Furthermore there is no firm evidence that more complex econometric techniques are necessary to resolve the remaining enigmas in arts demand studies especially when compared to obtaining more disaggregated data. On the other hand it is clear that applying additional theoretical structure to the derivation and interpretation of empirical results is warranted. This is especially necessary regarding the debate about the price elasticity of demand for the arts, and the choice of model specification will be particularly important in future studies exploring this issue.

More generally it can be concluded that more carefully done modeling, when combined with efforts to apply such models to less aggregated data, will doubtless be important to making further improvements in our understanding of the demand for

72 For example, Lévy-Garboua and Montmarquette (1996) themselves used a sample of 8000 individuals; other examples include Peterson, Hull and Kern (2000), Globerman and Book (1977) and Montgomery and Robinson (2005) with sample sizes of 17,135; 13,750; and 8000, respectively.
the performing arts. Despite the initial suspicion that the determinants of the typical performing arts demand function are obvious, there are surprisingly few arts-demand axioms beyond

1. the confirmation that demand curves are negatively sloped (i.e., assuming any contrary results reflect own price being a proxy for quality),
2. the performing arts are normal (but not necessarily luxury) goods, and
3. that some positive cross-price elasticities can be identified.

As stated by Lévy-Garboua and Montmarquette (1996, p. 26) after noting some general limitations of past arts demand studies, “it is nevertheless known that the performing arts are not exempt from the law of demand”. Empirical performing arts demand studies remain a rich area for further sound economic analysis.

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