

UCLA

UCLA Previously Published Works

Title

Extracting Consumer Choice Information from Box Office Records

Permalink

<https://escholarship.org/uc/item/46b0b3nt>

Journal

Performing Arts Review, 8(2)

ISSN

0031-5249

Authors

Cooper, Lee G
Nakanishi, Masao

Publication Date

1978-04-01

DOI

10.1080/00315249.1978.9944006

Copyright Information

This work is made available under the terms of a Creative Commons Attribution-ShareAlike License, available at <https://creativecommons.org/licenses/by-sa/4.0/>

Peer reviewed

EXTRACTING CONSUMER CHOICE INFORMATION FROM BOX OFFICE RECORDS

By Lee G. Cooper* and Masao Nakanishi*

Performing arts organizations traditionally keep extensive box office records. The records help insure that house attendance, tickets and box office cash can all be rectified.** Most arts managers keep careful track of the box office as the primary source of earned income. But few, if any, have gone beyond simply aggregating these data. In virtually every performing arts organization there is a vast amount of useful data collecting dust. This is a report of the analysis of such data collected from the Mark Taper Forum in Los Angeles, California.

The Season Ticket

As is true in most performing arts organizations there is a fundamental difference between people who purchase tickets for a single performance and people who purchase season tickets. They may or may not differ in demographic characteristics. They may or may not differ in psychographic characteristics. They are, in any case, substantially different in terms of the characteristics of the choice situation they faced in deciding to attend. The potential season subscriber may look at a preliminary announcement

* Lee G. Cooper is Associate Professor and Director, Management in the Arts Program, Masao Nakanishi is Associate Professor of Marketing, Study Center for Cultural Policy and Management in the Arts, Graduate School of Management, University of California, Los Angeles.

** See Box Office Guidelines. Foundation for the Extension and Development of American Professional Theater. New York 1974.

PERFORMING ARTS REVIEW

of next year's offering. Included may be some classics and some new plays; drama, comedy and musicals; well known directors, plays in repertory and the like. All these, as well as other "artistic variables" are presented in one package. You can take it or leave it. All the subscribers took it. They are identical with respect to their behavioral response to the artistic mix. Season ticket choice at the Mark Taper Forum is restricted to the following variables:

1. Day of week. There are performances Tuesday through Sunday, except certain holidays.
2. Matinee. There are matinees on Saturday and Sunday.
3. Seating Section. Section A holds 570 and section B holds 172.
4. Opening Night. Plays not in repertory, typically run for 54 performances beginning on a Thursday night.
5. Price. This is confounded by the prior four variables. It has varied a little from season to season, but 1975-76 prices show the trends for pricing sections and days.

	<i>Sunday through Thursday Evening</i>	<i>Opening Night, Friday and Saturday Evenings</i>	<i>Matinees</i>
Section A	\$7.50	\$9.00	\$6.00
Section B	\$5.50	\$7.00	\$4.00

6. Colloquy Series. On these evenings actors and/or the director have an open dialog with the audience after the performance.
7. Time of season. The season ticket holder may choose when during the run to see the play.

EXTRACTING INFORMATION FROM BOX OFFICE RECORDS

8. Choice of play. In the 1975-76 season only there was a small choice of plays that could be exercised. The regular season ticket included five of the six plays being performed. The season ticket purchaser could choose the third play or the sixth play as part of the regular package.

These are the ways in which season ticket subscribers may express their differences. All of this information is contained on the season ticket side of the standard box office form.

Since a season ticket subscriber chooses from 54 performances and whether to sit in section A or B, there are 108 alternatives a year. We collected data for 6 years. To deal with all the alternatives each year we employed an analytical model we have developed elsewhere (Nakanishi, and Cooper, 1974; Nakanishi, Cooper and Kassarian, 1974; Cooper and Nakanishi, 1975 and 1976). From this analysis we can assess the value of each of the attributes in explaining the choices made and the total amount (proportion) of variability in choice which is explained by the model. In this case 79.2% of all the variation was explained by the basic analysis. The weights (value) given to each variable are reported in Table 1.

Table 1

<i>Variable</i>	<i>Value</i>	<i>Value (without matinee)</i>
1. Day of Week		
a. Tuesday*	.00	.00
b. Wednesday	.07	.06
c. Thursday	.12	.11
d. Friday	-.08	-.05
e. Saturday	.22	.28
f. Sunday	-.02	.02

PERFORMING ARTS REVIEW

	<i>Value</i>	<i>Value</i> <i>(without matinee)</i>
2. Matinee	.14	**
3. Seating section		
a. Section A*	.00	.00
b. Section B	-1.02	-1.11
4. Opening Night	-.59	-.54
5. Price	-.11	-.35
6. Colloquy	.34	.33
7. Time of season		
a. First week*	.00	.00
b. Second week	.09	.09
c. Third week	-.01	-.01
d. Fourth week	-.06	-.06
e. Fifth week	-.10	-.10
f. Sixth week	-.23	-.23
g. Seventh week	-.47	-.47
8. Choice of play 1975-76	-.08	-.07
9. Year		
a. 1970-71*	.00	.00
b. 1971-72	.03	.03
c. 1972-73	-.01	-.01
d. 1973-74	.05	.08
e. 1974-75	.19	.22
f. 1975-76	.11	.19
Proportional of Variation Explained	.79.2	.78.9

Two analyses are reported in this table. The first analyzed all the variables. The second tried to unconfound the value of price by deleting the variable for matinee. With matinee (variable 2) removed the price (variable 5) importance goes from -.11 (minor) to -.35 (moderate).

* Set to zero. The other values in this group are contrasted to this zero value.

** This variable was not included in the second analysis.

EXTRACTING INFORMATION FROM BOX OFFICE RECORDS

The negative sign means, as expected, the more expensive the ticket the less likely it is to be purchased, other things being equal. The other variables remained highly stable over the two analyses.

1. The day of week variables showed some interesting patterns. Using Tuesday as a base for comparison, Wednesday and Thursday are valued a little more, Friday a little less, and Sunday almost the same as Tuesday. Saturday was the standout with around twice as much weight as any other day. It seems unusual, given only the value season ticket consumers see in days, that Friday should share the price premium with Saturday. Unless there is a policy by management to suppress season sales on Friday in favor of individual sales, there seems to be an opportunity to use price policy to increase season ticket sales on Friday.

2. Matinee has a positive value even if it is small.

3. Section A is much more highly preferred than B. This mostly is a reflection of there being over three times as many seats in section A as in B. But given that neither section is sold out through subscriptions more than availability is being reflected. The Mark Taper Forum is one of the houses in which there really are no bad seats. The management might think about ways to enhance the image of section B. Perhaps differential pricing to serving to create an impression of inferiority of seating which isn't really justified.

4. Opening night has a large negative impact on season ticket subscribers. This night is heavily attended by the

press, critics and others on complimentary passes. What can't be determined by this analysis is whether the large number of passes is mainly because of managements' choice for establishing a special character to opening night or mainly a response to low season ticket demand for that series (there is a price premium for opening night).

5. Price has already been discussed.

6. The colloquy which started in 75-76 seems to be valued feature for some season subscribers. It seems to be an effective way of capitalizing on a heretofore sporadic happening at the Forum. There is an audience for the colloquy and the play and it is easy to give this audience the option of knowing the colloquy will occur.

7. The time of season shows a particular marked trend. The second week is popular relative to the first, but every week thereafter shows a substantial decline in value to season subscribers. It is our guess that such a pattern accelerates the effect which word of mouth and critical reviews have on the total individual ticket sales for a play. The bulk of the individual tickets are for performance dates well after the plays have been reviewed and the first word of mouth has begun to spread. It also may mean that subscribers are more influential in word of mouth advertising than would be the case if they were distributed more evenly throughout the run.

8. Choice of play seemed to have minor negative effect. It is hard to rely heavily on this variable since even if a subscriber chooses one play on the subscription the other play could still be added as an extra play at an extra cost.

EXTRACTING INFORMATION FROM BOX OFFICE RECORDS

9. The six seasons were also compared. The general trend has been toward fluctuating growth in season tickets with 1974-75 being somewhat of a bumper crop year.

The Individual Ticket

The individual ticket purchaser might be selecting from a large variety of competing alternatives, including staying home. The set of alternatives is not enumerable in the same way as the 108 alternatives per year faced by season subscribers. The choice model employed in the prior analyses is designed for situations in which measures on all the alternatives are available. Such information is, of course, not obtainable from standard box office records. Our primary purpose for analyzing individual ticket sales is to investigate the artistic variables which could not be looked at through the season data. We want to *see* how the small amounts of artistic information typically known about a play relates to attendance. This can be done using standard multiple regression.

The variables chosen include eleven play attributes: foreign, comedy, musical (if a play was neither comedy nor musical it was a drama), classical (versus modern), controversial, naturalistic, presentation (if a play wasn't naturalistic or presentational it was impressionistic), world premier, west coast premier, or American premier, and if the play is well known. There are two author recognition variables: author recognized by the public and author recognized by "theater people". There are two director recognition variables: one for Gordon Davidson, the Artistic Director of the Mark Taper Forum, and one for Edward

Parone, the Associate Director (all other directors are grouped as "other"). There are three variables to represent characteristics of the cast: repertory cast, stage "star" in cast, film "star" in cast. We also include variables relating to the reviews which each play received. For this information we went to another source available in most performing arts organizations—the press books. Most arts organizations keep press clippings of the reviews and articles written on performances. We chose to look at three aspects of the reviews: what was said about the performances, what was said about the production, and what was said about the play. These aspects of the reviews were rated on a scale from 1 (poor) to 7 (outstanding).^{*} Reviews in all local sources were first investigated but three sources were finally evaluated: the review in the Los Angeles Times, the review in the Los Angeles Herald Examiner, and a synthesis of the reviews in the "trades" (predominantly Variety and the Hollywood Reporter). So there are nine critical review variables—ratings of three aspects in each of three sources.

The results of the multiple regression analyses are reported in Table 2. The beta weights represent the relative contribution of each variable in accounting for average individual ticket sales for all performances (i.e., each play is represented by a single number of the grand total of all individual tickets sold divided by the number of performances).

^{*} We would like to thank Ms. Nancy Mahon for her valuable work as research assistant on this project. In addition to helping with design and selection of variables, she read and rated the reviews of thirty-three plays over six seasons.

EXTRACTING INFORMATION FROM BOX OFFICE RECORDS

Table 2
Individual Ticket Sales
Multiple Regression Analysis

		<i>Beta Weights</i>	<i>Beta Weights (Excluding Review Variables)</i>
PA1	Foreign	.31	.13
PA2	Comedy	.52	.09
PA3	Musical	.48	.34
PA4	Classical	.33	*
PA5	Controversial	-.14	-.26
PA6	Naturalistic	-.34	*
PA7	Presentational	*	.14
PA8	World Premiere	*	-.23
PA9	West Coast Premiere	-.38	-.28
PA10	American Premiere	*	-.27
PA11	Well Known Play	*	-.31
AR1	Author Recognized by Public	-.24	-.14
AR2	Author Recognized Inside Theater	-.35	-.44
D1	Directed by Davidson	*	.23
D2	Directed by Parone	.08	.23
CA1	Repertory Cast	-.67	-.91
CA2	Stage "Star" in Cast	-.48	-.41
CA3	Film "Star" in Cast	-.38	+.07
R1	Review of Performance in Times	*	
R2	Review of Production in Times	-.12	
R3	Review of Play in Times	-.06	
R4	Review of Performance in Examiner	-.12	
R5	Review of Production in Examiner	-.10	
R6	Review of Play in Examiner	-.25	
R7	Review of Performance in Trades	-.24	
R8	Review of Production in Trades	.14	
R9	Review of Play in Trades	.77	
	Proportion of variance explained	.98	.78

Two multiple regressions were run. The first included all variables described. The second excluded the nine review variables. This was done primarily because in the first analysis the review of the play in the "Trades" had the largest beta weight of all variables (.77). We won-

* A stepwise program was employed and these variables did not contribute enough to be included in the analysis.

dered to what extent the weight given to the review variables would be spread among the other variable? How much of the total variation in individual sales, explained by all the variables, would still be explained without the review variables? With the review variables included in the analysis around 98% of the variation is explained. Without the review variables 78% was explained. This means around 20% of the variation in individual tickets sales is attributable to the review variables. This is beyond for what the other artistic variables can account. While the early dominance in the run of season subscribers allows for critical review to have more of an impact there is no implication that the relation is completely causal. Potential audience could be responding to the same evaluative dimensions as are the reviewers. Clearly, though, the "trades" are tapping into aspects of the play that are related strongly to individual sales.

Repertory cast (CA3) has a large and negative weight in both analyses ($-.67$ and $-.91$). In the analysis without review variables it is more than twice as important as any other variable. The "dislikes" seem to predominate. There is moderate negative weight for "insider" playwrights, stage "stars" in the cast, any kind of premiere, well known plays and controversial plays. The "likes" include moderate positive weights for musicals, comedies, foreign plays and plays directed by Davidson or Parone.

Conclusion

It is apparent that there is a good deal of potentially useful information which lies unanalyzed in box offices throughout the country. How is this information, once analyzed, to be used, is an important question. It speaks partly to the role of management in artistic decision making.

EXTRACTING INFORMATION FROM BOX OFFICE RECORDS

Is artistic decision making a process in which attention is given only to artistic criteria? Or is it a process in the furtherance of purely artistic goals which attends to any information relevant to the pursuit of those goals? If it is the latter than it seems incumbent upon management to provide systematic information on the audience for the art to the artistic decision maker. These data may then take on whatever role the artistic decision maker deems proper in the informational mix which influences the decision making process.

It seems to these authors that an actor's needs extend beyond a good role in a good play. An actor needs an audience too. Some audience information seems naturally a part of decisions. And the data are there for the taking.

References

- Cooper, Lee G. and Masao Nakanishi, "On Integrating Attitude with Choice." Paper presented at the 5th Management Science Summer Colloquim, Osaka, Japan, August, 1975.
- Cooper, Lee G. and Masao Nakanishi, An attitudinal theory of choice, 1976 (In preparation)
- Nakanishi, Masao and Lee G. Cooper, Parameter estimation for a multiplicative competitive interaction model—least squares approach. *Journal of Marketing Research*, Vol. XI (August 1974) 303-11.
- Nakanishi, Masao, Lee G. Cooper and Harold H. Kasarjian, Voting for a political candidate under conditions of minimal information. *Journal of Consumer Research*. September, 1974, 1, 36-43.