Statistics in Jury Selection:

How to Avoid Unfavorable Jurors

S. James Press *JurEcon, Inc., Los Angeles and University of California, Riverside*

Statistical methodology can be used in a jury trial to help attorneys to select out those jurors who are likely to be unfavorable. I will first trace the origin of the jury system and comment on various problems associated with picking a jury at random; then I will discuss peremptory challenges and the use of statistics to make those challenges most effective in avoiding jurors who are likely not to favor the client.

Colonists of English origin brought with them to the American continent legal procedures with which they were familiar, including the jury system. In 1606, James I of England granted a charter to the Virginia Company, including the right to "trial by jury." The right was later granted to Rhode Island (1663), New York (1664), New Jersey (1677), and Maryland (1693). Ultimately, the right to trial by jury was guaranteed to all Americans by the Bill of Rights, in both criminal trials (the Sixth Amendment), and civil trials (the Seventh Amendment). But the Constitution was vague about the "number of persons" who should

make up a jury, the "kinds of persons" who should be on a jury, and the "way in which the jurors should be selected."

Over the years, various jurisdictions have experimented with juries comprised of various numbers of persons, ranging from six to twelve, with varying degrees of success. (Six persons are typically used in federal jury trials.) Also, two-thirds or three-fourths majority rules have been tried instead of unanimity being required for a jury decision.

In terms of the "kinds of persons" appropriate to serve on a particular jury, how should the notion of "a person has the right to be tried by a jury of his peers" be interpreted? Who are a person's peers? If a person on trial is Black, for example, should the jury contain the same proportion of Blacks as in the venue? In the county? In the state? In the country? The issue is resolved differently in different jurisdictions in the country.

Experts distinguish various stages of the jury selection process. They start with random selection of potential jurors from voter registration lists and lists of automobile owners, using constraints such as "a potential juror should not be required to travel more than 30 miles from home" and dealing with overlapping boundaries of courthouse jurisdictions. Is such a constrained selection process really random? Another stage of selection of jurors involves the elimination of constitutionally unqualified persons. Then there is the elimination of persons considered undesirable by the attorneys (*voir dire*). This step results in the selection of a complete jury (usually 12 persons for a municipal, county, or state jury, or 6 persons for a federal jury), with alternates, from the pool of potential jurors.

Statistical procedures have frequently been used to study various aspects of this selection process. For example, statistical procedures have been used to study how "representative" a particular jury is of the area in which a crime may have been committed—have certain minority groups been systematically excluded? Statistical procedures have also been used to examine how random the selection procedure is. In order to keep this article brief, however, I will confine the discussion to the use of statistics in the voir dire process.

The term voir dire literally means "to speak the truth" (from the French). In practice, a large pool of randomly selected potential jurors is developed (up to 100 persons) in order to select 6 to 12, plus alternates. This pool contains persons who are statutorily eligible to serve. But, as we all know, people have all kinds of prejudices that they bring to a particular case. Ideally, society would like jurors to be impartial in the case they try. For this reason, attorneys for both sides are usually permitted to ask potential jurors a battery of questions designed to identify persons who are likely to be partial. (In federal cases, the questions are generally asked by the judge, although attorneys are usually permitted to present the judge with a list of questions, which he or she may or may not ask.) The attorneys are preassigned a fixed number of *peremptory challenges* (that is, opportunities to excuse a potential juror without having to give any explanation). The attorneys use these peremptory challenges to exclude from the jury persons who are likely to be unfavorable toward their client in the case. The process of interrogating potential jurors in this way, where the potential jurors are asked "to speak the truth," is called the voir dire.

How does an attorney know which potential jurors to challenge? Historically, attorneys challenge jurors on the basis of the attorneys' own experience and intuition. If their visceral reaction to a potential juror is negative (or if he or she seems overtly unfavorable toward the client), the lawyers excuse that potential juror from serving. Today the procedure is sometimes more scientific; it is sometimes based upon statistical analysis and social science.

APPLYING STATISTICAL METHODS

The use of statistics and social science to assist in the voir dire process, in a formal way, dates back to the early 1970s: the *Mitchell–Stans* trial, the *Harrisburg Seven* trial, the *Attica* trials, and others. In these cases scientific methods were employed by the defense (rather than by the prosecution) to assist in the voir dire process (and also to assist in other aspects of the case). The cases typically involved political issues, multiple defendents, and substantial publicity. When there was substantial pretrial publicity, which was often unfavorable to the defense and made it more difficult for the defense to impanel jurors who would not be unfavorable, the defense was generally given additional peremptory challenges as "compensation." Statistical methodology for scientific jury selection was proposed by various research workers. (Their treatments of jury selection bear on a variety of different aspects of the cases, ranging from statistical, social, psychological, and ethical, to legal—see references.)

I will illustrate the methodology with an example that uses the demographic characteristics of potential jurors to improve the chances of not getting unfavorable jurors on a jury. The situation described, the company mentioned, and the data used are all fictitious, but the case has its roots in real disagreements among actual organizations; the actual facts are proprietary. Jury selection methodology was used successfully in these cases, and in many other cases.

The Mandeville Chemical Company (MCC) has been in business for many years manufacturing items containing chemicals. While these chemicals have had many beneficial uses in industrial applications, one of them has been found to be toxic to human beings and can cause a variety of diseases, including cancer. Many workers brought suit against MCC to cover their medical expenses, and MCC paid off. But MCC, in turn, filed suit against its insurance companies for failing to compensate MCC. The insurance companies argued that MCC had never informed them it was in the business of making a dangerous product. Had they known, they would not have agreed to insure. The case was clearly very complicated. It was not a simple case of some "little guy" suing a big corporation; it was a case of "the big" suing "the big." What kinds of jurors would be likely to be unfavorable (and favorable) toward MCC?

The company decided to do a telephone survey of 800 people. These people were to be asked whether they were U.S. citizens, whether they were located within the trial venue (that is, in the area where the case was scheduled to be tried), and some other questions to determine whether they were potential jurors in the case. (Of those surveyed, 720 were found to be potential jurors.) Potential jurors were then asked a battery of questions. Random digit dialing was

used to include people with unlisted numbers. In this procedure the first three digits of a telephone number are selected to correspond to the geographic area of interest. Then the last four digits are selected at random. The result may be a listed or an unlisted number. This is done repeatedly in that area so that many people are reached. The first three digits are then changed and the process is repeated. With a sample as large as 720, conclusions drawn from the sample about how potential jurors view the case could be generalized, with a high degree of confidence, to the larger population of potential jurors contained in the entire venue. (This generalization can be made when the sample is drawn randomly from the population of all potential jurors in the venue.) Respondents to the survey were informed about the facts in the case and were then asked to give their background characteristics, such as gender, age, ethnicity, income category, and so forth. Some subsidiary questions were asked as well, to determine whether there were any points about the case difficult to understand. (If so, the case for the plaintiff could be honed to clarify such points.) Finally, the respondents were asked how they would vote if they were on a jury trying the case.

INTERPRETING THE RESULTS

It was found that 65% of the 720 persons surveyed who were eligible to be jurors in the trial would be unfavorable toward MCC, and 35% would be favorable. The problem was to determine how to distinguish between the two groups so that socioeconomic "marker" variables for partiality against MCC could be used to determine which jurors should be challenged peremptorily and excused.

Cross tabulations of the fractions of respondents unfavorable and favorable toward MCC (the plaintiff) are shown, for age and for gender, in Tables 1 and 2, respectively.

When MCC first looked at the 35% of the total number of respondents who favored the plaintiff, it didn't know anything about them. Examination of Table 1, however, showed that 66% of the population favorable toward MCC was aged 21 to 40 (0.23/0.35), with only 11% aged 41 to 55 (0.04/0.35), 6% aged 56 to 70 (0.02/0.35), and 17% older than 70. More important, MCC then

Table 1 Cross tabulation by age

Age	*Absolute Fraction Unfavorable Toward MCC*	*Absolute Fraction Favorable Toward MCC*	*Totals*	*Fraction of Age Group Favorable Toward MCC*
21–40	0.37	0.23	0.60	0.38
41–55	0.10	0.04	0.14	0.29
56–70	0.03	0.02	0.05	0.40
Above 70	0.15	0.06	0.21	0.29
Totals	0.65	0.35	1.00	0.35

Table 2 Cross tabulation by gender

Gender	*Absolute Fraction Unfavorable Toward MCC*	*Absolute Fraction Favorable Toward MCC*	*Totals*	*Fraction of Gender Group Favorable Toward MCC*
Male	0.52	0.08	0.60	0.13
Female	0.13	0.27	0.40	0.68
Totals	0.65	0.35	1.00	0.35

knew that member of the 20 to 40 group were more likely to be favorable toward the company than were older persons, although the few in the 56 to 70 category were slightly more likely to be favorable (0.40 versus 0.38). It is also clear from Table 1 that the 21 to 40 group was more likely to be favorable toward MCC than was the 41 to 55 group (0.38 versus 0.29). Table 2 shows that 13% of males were likely to be favorable toward MCC (0.08/0.60), and that females were five times as likely as males to be favorable toward MCC (0.68/0.13). Thus MCC knew that if it were to do its best through peremptory challenges to eliminate potentially unfavorable jurors, it should try to avoid older persons and males. Other variables could be used as well. Although these numbers might have been found for this particular case, in other cases totally different sets of numbers are likely to emerge. That is, people's demographic characteristics tend to shape their views according to the context of the case.

Since information about ethnicity, education, income, blue collar versus white collar, and other variables was also available, cross tabulations of these other variables could also have been carried out. For example, Table 1 could be expanded into a higher dimensional table (that is, one containing more variables) so that we could record the fraction of persons who are, say, simultaneously male, college graduates, white, and so on. More-informed conclusions could then be drawn. Also, statistical models could be built to understand the types of people who were not favorable toward the plaintiff.

Of course background characteristics are often only very crude markers of juror voting behavior. Better markers are variables that are surrogates for attitudes, actual behavior, political and social beliefs, and so forth. Such variables can be measured by using a telephone survey to ask such questions as which newspapers the respondent reads, what is the respondent's political affiliation, religious preference, to which clubs or organizations does the respondent belong, what was the respondent's major in college, and whether he or she went to college. Social science research has shown that such variables are likely to be better indicators of juror voting behavior than demographic variables.

The task of an attorney is to represent the client as well as possible. That is, the attorney is an advocate of the client's position. The attorney uses jury selection methods to further the client's case. If this methodology minimizes the chances that some jurors will be a priori hostile to the client's case, regardless of the evidence, the overall justice system benefits.

PROBLEMS

1. Which of the four age groups in Table 1 had the largest number of people unfavorable toward MCC?

2. Which age group in Table 1 had the smallest fraction of people unfavorable toward MCC?

3. Suppose that data are jointly available for age (old versus young) and gender (male versus female) instead of separately as in the text and that the joint information is distributed as follows:

	Absolute Fraction Unfavorable Toward MCC			*Absolute Fraction Favorable Toward MCC*			*Totals*
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	
Young	.27	.10	.37	.06	.17	.23	.60
Old	.25	.03	.28	.02	.10	.12	.40
Totals	.52	.13	.65	.08	.27	.35	1.00

   a. In each of the four age-gender groups find the fraction favorable toward MCC.
   b. Are any of the fractions favorable toward MCC you found in Problem 3a higher than the highest of the four in Table 1 and the two in Table 2? On this basis, which two age-gender groups will the attorneys for MCC most tend to challenge and which two will the defense most tend to challenge?

4. a. In the table for Problem 3, suppose the subtotals remain fixed and you are allowed to decrease the number in the unfavorable male-young cell. What is the smallest value it could have?
   b. Find the smallest entry possible in the favorable male-old cell, keeping the subtotals fixed.

REFERENCES

Reid Hastie, Steven D. Penrod, and Nancy Pennington. 1983. *Inside the Jury.* Cambridge, Mass.: Harvard University Press.

David Kairys, ed. 1975. *The Jury System: New Methods for Reducing Prejudice.* Philadelphia: Philadelphia Resistance Print Shop.

James W. Loewen. 1982. *Social Science in the Courtroom.* Lexington, Mass.: D. C. Heath.

W. McCart. 1965. *Trial by Jury: A Complete Guide to the Jury System,* 2nd ed. Philadelphia: Chilton Books.

S. J. Press. 1988. *Statistics in Jury Selection.* Department of Statistics Technical Report No. 163. Riverside, Calif.: University of California.

J. Schulman, P. Shiver, R. Colman, B. Enrich, and R. Christie. 1973. "Recipe for a Jury." *Psychology Today* 6(May): 37–44, 77–84.

Jon M. Van Dyke. 1977. *Jury Selection Procedures.* Cambridge, Mass.: Ballinger.