DISCUSSION

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The paper by Haworth and Haworth puts a useful emphasis on the use of implicit models by the parties or by the judge in legal cases. For example, in the jury discrimination cases an implicit model of random selection from a pool of individuals qualified for jury duty is assumed. In wage discrimination cases an implicit model of wage determination assumes that wages are paid on the basis of factors that are distributed alike in all groups. One of the contributions of statistical analysis is to lay bare implicit models and deduce some of the implications that flow from models. In the jury cases a random model of fair selection of jurors may be the appropriate legal standard and implications drawn from it by mathematical and statistical reasoning may assist the judge in making a correct determination under the given standard (See Finkelstein, "The Application of Statistical Decision Theory to the Jury Discrimination Cases", 80 Harvard Law Review 338 (1966).)

An implicit model usually underlies a quotation of the probability of some event. In one of the jury discrimination cases referred to in the paper the percentage of Blacks on juries had not exceeded 15 percent for 15 years though they comprised 26 percent of the popula-tion, and the probability of this event was quoted as 4.63×10^{-21} . This small probability was computed under a model of independent random selections for the jurors in a series of juries in 15 years. The value of the probability is of course very much dependent on the model assumed, and this point is often lost when the value is produced as the probability without reference to the model. As a footnote to this example I would add a reference to the discussion of very small probabilities, such as the one quoted, by Mosteller and Wallace in Inference and Disputed Authorship: The Federalist (Addison-Wesley, 1964). They discuss the inherent incredibility of a very small probability of an event whenever there are "outrageous events" that might produce the given event which themselves have probabilities larger than that of the small probability quoted. The result is a reductio ad absurdum. The small probability cannot be that small.

Brosi and Brounstein present part of a larger and continuing research effort. Their work touches on a number of interesting questions for people interested in how statistics can be used to aid decision making in the law. Are there statistically derived functions available about a defendant that can be used to improve decision making about bail and other matters? If so, where and how is it appropriate for the judge to enter his subjective opinions? Work in the psychological literature on these questions was stimulated some time ago by Paul Meehl in <u>Clinical versus Statistical</u> <u>Predictions</u> (University of Minnesota <u>Press</u>, 1954). See more recent discussions, for example, Robyn Dawes, "A Case Study of Graduate Admissions: Application of Three Principles of Human Decision Making", <u>American Psychologist</u>, February 1971. Current literatures on predicting parole success and on predictive efforts in preventive detention and in other legal contexts are also relevant.

Could the research discussed in the Brosi and Brounstein paper relate to legal and policy issues surrounding preventive detention and bail? What might the research have to say about the difficulties of prediction that judges face? What are their likely Type I and Type II error rates? Will anything be said about differences between judges?

The use of some of the information on defendants that is discussed in the paper is circumscribed by law or custom. For example, prior criminal record and the sex or race of the defendant might or might not be permitted to enter as a "variable" in some of the uses of the research that are proposed. How are these issues to be handled?

The Gastwirth paper raises the following issue. Legal standards, though often stated informally in terms of chances, are rarely defined with reference to precisely stated probabilistic criteria. The paper shows in several precise ways how poor a lottery it was that Glen Turner offered to prospective dealers. How were standards of fraud (and other appropriate standards if any)applied in this case?

The probabilities computed in the paper rest on the assumptions of the model, in particular that the probability that any specific one of k current members of the scheme recruits the next member is 1/k. Suppose this assumption were relaxed, for example, by recognizing differences in ability among members. What would be the effect on the probabilities, which would now differ by member, and how would this affect the finding of fraud?

The use of an upper bound for the Posson approximation to the sum of binomials was a clever way to avoid legal challenge. We may still ask whether a suitably stated approximation not involving an upper bound would have served.