

# INTRODUCTION

## A BRIEF REFLECTION ON JUDICIAL USE OF SOCIAL SCIENCE DATA

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### I

#### INTRODUCTION

Alfred N. Whitehead taught that:

It is a profoundly erroneous truism, repeated by copy-books and by eminent people when they are making speeches, that we should cultivate the habit of thinking of what we are doing. The precise opposite is the case. Civilization advances by extending the number of important operations which we can perform without thinking about them.<sup>1</sup>

This is not the journalistic ploy of the clever lead, but a reference to the value of abstraction — of non-tendentious thought. Whitehead also defended mathematics by the argument that “the really profound changes in human life all have their ultimate origin in knowledge pursued for its own sake.”<sup>2</sup>

But in this issue of *Law and Contemporary Problems* we are not in pursuit of knowledge for its own sake. Instead we are reflecting, if in a free way, about the role of mathematics in the solution of legal problems. In this effort, I speak of direct usage—hands-on solutions and real effects rather than the value of mathematics as a training device for thought.

Nor am I speaking of the contribution of mathematics to the technology of the sciences. Instead my reference is more modest. It is the use of mathematical variables to measure correlation and chance. Correlation brings mathematics home to the law because it is with linkage of events to events that the law is peculiarly and historically concerned. That is, judgments about causation are typical legal products and are often made. It was inevitable that race and sex, given their pure immutable status, should be the subject of probability and chance measurement. This natural affinity of the mathematical variable and causation has long existed. With the recent development of the microprocessor and the recent widespread use of multiple linear regression analysis this affinity has gained in practical utility.

In the trial of cases the expert witnesses provide the procedural device for the use of such techniques. Given that experts, supported by their math models, can testify concerning relationships undeniably at issue before the court, we have the

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1. A. WHITEHEAD, AN INTRODUCTION TO MATHEMATICS 61 (1911).  
2. *Id.*

procedural means for using these methods in traditional courtroom settings, and if sometimes stretched a bit, with traditional and familiar courtroom procedures.

The greater challenge may be in the judicial use of extra-judicially messaged studies and data. While whole packages of such processed data are frequently used by the economist, the broker, the security analyst, the legislative aide, and hundreds of others in making decisions that affect our lives, the assumptions incorporated into these packages may be hidden and difficult to detect with traditional judicial techniques of scrutiny. In essence, two core notions of legal decision-making counsel a wary view of social science data and particularly its quantitative techniques: first, that the decision be derived by logic, guided by fairness and defended by intellectual process; and, second, that the decision resolve a dispute between identifiable discrete parties.

But the microprocessor feeds the current fascination with quantification, and the seeming enthusiasm for mathematical models of many liberal arts disciples is sufficiently contagious to pique the interest of the legal community. These changes, and changes in the substantive issues facing courts, conjunctively have resulted in judicial decisions that tax both core notions of legal decision-making. Such "newer" decisions seem to lack the internal rigor of the common law analogical process. This lack of a traditional form of rationalization is the result both of fewer adherents to our tradition of rigorous logical technique and of changes in the nature of the "dispute" to be resolved from private feuds to matters of public governance. For example, review of atomic energy licensing may present a "dispute" that resists solution by traditional "legal" reasoning. But this is only to introduce the issue which I wish to surface for our discussion—how social science data are presented to the courts. By social science I mean the quasi-disciplines of organized and systematized study of people, their environment, the politics of their government, their history, and anthropology, all traveling as academic "sciences." I see at least three principal entryways, or intake ports, to the courts for social science data, particularly data relying upon quantification techniques. While they overlap, they also provide focal points for glimpses at changing decisional processes. These three entryways appear within the administrative law model, the judicial model, and the academic model.

## II

### THE ADMINISTRATIVE LAW MODEL

Beginning with the changing face of the Supreme Court in the thirties through the years of world war II, the entire administrative law structure so familiar to us today gained acceptance. Congress created many agencies entrusted with power and with only the most general guidelines. Some were purely administrative, some were predominantly judicial, and some occasionally wore both hats. But they all addressed wide-ranging social problems heavily dependent upon data. As our technologies exploded, so did regulatory response. The regulators used, if in a relatively lax manner, traditional judicial devices for evaluating data, such as evidentiary rules and confrontational techniques. Their decisions in turn were checked by limited judicial review, most often by deferential standards such as

substantial evidence. The agencies made basic economic decisions about airlines, railroads, drugs, securities, working conditions, highway construction, and a host of others. Soon regulatory agencies also addressed atomic energy, environmental concerns, and other areas of high technology.

With the expanding role of regulatory agencies, we became increasingly concerned about the accountability of their decision-making. Questions were asked about the basic competence of the courts or the Congress to supervise the regulators, and which branch, if either were deemed competent to do so, ought to do the supervising. An increase in the intensity of judicial review followed. Predictably, judicial opinions took on an unfamiliar cast, particularly in those courts of appeals which drew the cases in large numbers, such as the United States Court of Appeals for the District of Columbia. Appellate judges were required to evaluate large quantities of processed data from cold records and briefs. Often, the underlying judgments of the agencies were bottomed on studies utilizing math models. The records were often sufficiently complex that one could fairly wonder about the technical competence of generalist judges to conduct a meaningful review. Other consequences aside, large quantities of data and technological decision-making flowed easily through this administrative entry port into the courts and exited with judicial imprimatur.

### III

#### THE JUDICIAL MODEL

Using the federal courts as a reference, it is instructive to separate their intake ports by level. At the trial court, the present technique for evaluation of data is familiar to court observers. Subject to cross-examination, an expert witness explains his data base and conclusions. Despite the seeming familiarity of the role of the expert and his use of social science data in the traditional adversarial format, this dynamic of trial has shifted markedly since the adoption of the Federal Rules of Evidence of 1975. At common law, an expert could testify on the basis of information obtained by a personal observation or examination or in response to awkward hypothetical questions. By contrast, Rule 703 of the new rules of evidence limits an expert in his reliance upon data only to "a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, [and] the facts or data need not be admissible in evidence." This rule brought the intake ports of the federal trial court and the administrative law model into near alignment. Complex studies became of pivotal importance in products liability, discrimination, securities, voting rights, and other cases. Many cases have become virtual battles of experts, each supported by an array of studies.

The increased ability to process large quantities of data will push to their limits procedural devices such as class actions, devices which prompted the use of massive data in the first place. While increased sophistication in managing data may in one sense make large classes more "practical" or "manageable," it travels against the intuitive reluctance of courts to attempt dispute resolution en masse. Our adversarial system is itself in no small part a product of our highly individualistic political culture. More concretely, class litigation pushes the math models to

the center of the dispute, requiring judges to demonstrate their mastery, rather than simply judging the expertness of the use of such models by experts. This creates incentives to contain their use that in turn increases the pressure to reexamine class procedures and class definition. We can speculate that courts will either gain the competence necessary to use math models or circumscribe their use by cutting back on the procedural devices themselves. In the short run, restrictions on the class action seem the more likely response.

I recently presided over the pre-trial development of massive market manipulation cases involving eight classes of traded securities on the major exchanges. Enormous investment of money and time was devoted to the proof of a "damage ribbon." That ribbon was a graphical expression of the contribution to price made by disclosures claimed to be false. The entire process would have been a doubtful undertaking but for the coincidence of the change in the technique for the presentation of such evidence and the microprocessor itself. The microprocessor made the calculations practicable, and the new role of experts provided the necessary procedural device for their courtroom presentation. That this case was to be tried to a jury raised questions of lay competence and required considerable time to explore techniques for making the case understandable to persons most of whom were not trained beyond the level of basic algebra. This exercise is being repeated in different substantive areas in different courts throughout the country, each raising in turn questions about the competence of the courts to manage such disputes.

Despite these difficulties, the trial may present fewer problems than appellate review. If our market manipulation cases had been tried and appealed, appellate judges would have tackled the cases on the written record aided by oral argument. While they would not have had the daily tutoring provided the trial court, the dispute would have been presented in a relatively traditional way. Curiously, the record would not be wholly different from an administrative record. The standard of review would probably shift to "clearly erroneous" from "substantial evidence," but the inquiry would not be wholly different.

The data for the market manipulation cases would have been developed largely for the trial court, and would have been contained in the record for consideration by the appellate judges. This illustrates one type of judicial entry port for social science data. But if we shift our inquiry to review of a claim by a seaman injured aboard ship by a defective hoist, the problem changes and another entry port can be seen. Suppose the seaman sues the manufacturer of the hoist under traditional products liability law, a doctrine that does not ordinarily allow the defense of contributory fault, comparative or otherwise. The question presented to the court of appeals now is whether the traditional admiralty concept of comparative fault ought to be adopted, or whether it should apply traditional products liability doctrine. Plainly, the choice will have significant economic impact. Indeed, with virtually any tort question, fault definitions quickly express themselves in economic terms.

Ultimately, the vote of the individual judge on the question of whether to adopt a comparative fault standard will mirror his individual predilection and

ethical regimen. The legal realist may suggest that a jurist simply expresses his personal vision, but putting to one side one's own notion of personalized decision-making, one must ask how the ethical response by the individual judge will be informed. How will he know that his vision of societal order will follow from his decision? There will be no record reflecting economic judgments or studies. There will be only the literature; the judge must turn to the writing in the field. Here is another judicial entry port, and this one is without a safeguard. The only limit upon the judge is his own willingness to roam related disciplines. His willingness to do so is disciplined by little more than his perception of technical competence. Putting to one side the occasional jurist who may have sufficient training in microeconomics, or in other fields, the great bulk of judges will be dependent upon the opinions of the writers. Looking to their conclusions, he must take their data bases on faith. He has little with which to measure the strength of their conclusions beyond his confirming intuition. There is a perversity here. In deciding the rights of an individual plaintiff at the trial level we erect considerable procedural safeguards over the intake of data. Yet, when the decision will produce a rule of universal application, we drop those safeguards. This brings me in turn to the third assimilation port—the academic model.

#### IV

#### THE ACADEMIC MODEL

There is a symbiosis between law schools and appellate courts. Appellate opinions are fodder for academic exercise, and academic writings in turn provide synthesis and critical analysis to the court. With their expanding quantification capabilities, academics funnel to judges ideas often buttressed by large quantities of data. A quick check of the footnotes in opinions addressing technical subjects will confirm this assertion, even disregarding the wholly decorative citation.

Academic support has historically been largely that of doctrinal analysis. This most important supportive role consists in the main of identifying ambiguity, inconsistency, and trends in judicial decision-making. It is characterized by its independence, or autonomy, in that it does not require a secondary discipline for its practice. As Judge Posner points out, this analysis also included measures of consistencies with "certain premises about justice."<sup>3</sup>

The nature of academic support, however, has changed. Judge Posner has compared doctrinal analysis to interdisciplinary research, which he termed "law and . . ."<sup>4</sup> He noted that when legal scholars attempt interdisciplinary research, they "stray from the narrow path of doctrinal clarification and enter the realm of policy analysis, [and] their lack of social science training may lead them into error."<sup>5</sup> In turn, he subdivided interdisciplinary research into the positive, being the effort to understand a phenomenon, and the normative, being the effort to reform. How the social sciences and humanities will reform the decision-making

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3. Posner, *The Present Situation in Legal Scholarship*, 90 *YALE L.J.* 1113, 1114 (1981).

4. *Id.* at 1119.

5. *Id.* at 1115.

process remains a puzzle. Until this interdisciplinary effort matures, the intake of data by judges, at least at the appellate level, will remain largely unchecked. In concrete terms, strict doctrinal analysis may not provide adequate support for the resolution of the seaman's claim. so the question remains: what ought we turn to and what procedural mechanism ought to be in place for that effort?

## V

### CONCLUSION

I have identified three major intake ports for the data now being quantified. I have referred to the administrative law model, the judicial model, and finally the academic community itself. In each model there is little doctrinal or institutional structure for processing the flow of information in the quantity and form now available. There comes with this information the danger that judges at sea with "law and . . ." may fail to recognize their subtle bias and assumptions, and in the process suffer a greater risk of error than is presented by reliance on the intuitive and traditional analogical processes of the lawyer. More fundamentally, there is the question of the basic role of courts in our government. There is a point at which such judicial decisions look much like legislative action. In sum, we are talking about more than technical competence. My own vision of disinterested, neutral dispute resolvers is then sorely taxed. Perhaps we ought to face that question before we point to perceived educational deficiencies in our judges.