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Leslie T. Wilkins

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## PROBLEMS WITH EXISTING PREDICTION STUDIES AND FUTURE RESEARCH NEEDS

LESLIE T. WILKINS\*

Most decisions involve risk and are thus subject to two kinds of error. Prognoses, estimates of future conditions, and all probability statements are subject to the same two kinds of error. In criminological prognoses, the decisionmaker can be in error in that: (1) the individual who is predicted to fail may succeed, or (2) the individual who is predicted to succeed may fail. These two kinds of error apply to all decisions or estimates irrespective of the means by which such decisions or estimates are derived. In criminology, neither clinical nor statistical methods of prognosis and prediction can avoid the two classes of error.<sup>1</sup> In addition, these two kinds of error will be present no matter how success or failure are defined. The first kind of error is usually termed a "false positive," or "overprediction." Overprediction will tend to increase in proportion to the decrease in the number of individuals who fit the "fail" category. It is important to stress that false positives cannot be avoided.

Clinical methods usually are not able to estimate the magnitude of the errors, whereas statistical methods do so as an integral part of the process of calculation of the likelihood of success or failure. But clinical ignorance of the size of the errors does not mean that those studies produce a smaller number of errors than studies applying statistical prediction. Where comparisons have been made of the false positive rates, the clinical rates have been larger in almost all instances.<sup>2</sup>

### THE USE OF PREDICTIVE STATEMENTS

At present, statistical predictions, and also, by inference, all clinical predictions, produce a large proportion of false positives. The proportion, to

\* Professor, Graduate School of Criminal Justice, SUNY Albany; currently, Visiting Professor, Simon Fraser University.

<sup>1</sup> In industrial decisions, the two classes of error are often termed "producer" and "consumer" risks, and estimates of the magnitude of the two classes are frequently written into contracts.

<sup>2</sup> P. MEEHL, *STATISTICAL V. CLINICAL PREDICTION: A THEORETICAL ANALYSIS AND A REVIEW OF THE EVIDENCE* (1954).

some degree, depends on the frequency of the phenomenon predicted. Violent crimes, for example, occur less frequently than property crimes and thus tend to show lower levels of predictability. Some law and criminal justice writers have suggested that because of the presence of false positives in predictive statements, statements and decisions having a predictive basis should be avoided in all dealings with offenders. In other words, these writers assert that reference should be made only to the past; it is improper to give consideration to the possible outcome of a decision. This is the position taken by advocates of the "just deserts" theory. It must be realized, though, that despite the fact that prediction is believed to have been avoided if it is not directly invoked in the interpretation of previous events, it may, nonetheless become involved (in some ways not completely understood) in the definitions of "culpability."

Whether prediction really is avoided is not, of course, the major issue of concern. What is of concern are the qualities of the decisions, whether or not they make use of "predictions." Humans seem to be anticipating creatures, and there is difficulty with the "just deserts" proposition that this faculty, for ethical reasons, should be inhibited.

### EVENTS AND PERSONS

Individuals cannot validly be classified as "dangerous" or "not dangerous," but their crimes can be. The commission of a crime is an historical event that can be analyzed with precision. On this basis, one might argue that thought should be concentrated upon definitions of those kinds of behaviors (not persons) that require restraint. Of course, the person (who—prediction or not—will continue into the unknown future) will be involved in any such restraining situation. But the logic underlying the disposition of the case would be independent of judgments about personality.

Although a crime may be contemplated, legally defined, and discussed independently of the offender, in operational terms the actor cannot be separated from the act. However, one can discriminate between micro and macro models in terms

closely analogous to those of economic theory.<sup>3</sup> One could propose methods of dealing with the issues of crime that do not involve a clear concept of the individual offender. The focus instead would be placed upon the features of situations common to many crimes. In this manner, it might be possible to take action about crime (macro models) independently of action attempting to deal with the individual offender (micro models). However, this type of approach remains relatively unexplored.

#### MEASURES OF THE SERIOUSNESS OF CRIMES

Researchers who have attempted to provide scales of the seriousness of crimes have relied upon ratings by samples of assessors.<sup>4</sup> A single dimension of "seriousness" has been postulated in which the act is described without any reference to an actor. A nebulous generalized actor must be assumed. However, it is doubtful that the people who are recruited as assessors find it possible to imagine a disembodied act. Raters probably fit a stereotyped actor to each instance of crime presented in the sample of acts. This produces an unknown sample of actors (offenders) who have been supplied by the imagination of the assessors making the ratings of the crimes. For example, the crime stimulus "theft of \$1.00" poses the image of the kind of person who could or would steal \$1.00; and the stimulus, "theft of \$10,000" poses the image of the kind of person who could or would steal \$10,000. The two offenders "supplied" to match the stimulus are not likely to be the same kind of person. Thus, assessments of the seriousness of acts may well be confounded with attributes of offenders as ascribed by raters. The implications of this may be of considerable significance for all seriousness scales.

<sup>3</sup> The distinction between micro and macro models may be illustrated by noting that the skill necessary to operate a village grocery store is not an adequate qualification for a director of the budget. The economic theory that leads to success in a small business is not the same as the theory that is required to guide a national policy. The domestic detail of individual purchases (so much appreciated in a village community) does not rise to the level of the kind of sophisticated abstraction necessary to form the basis of a national marketing policy.

Perhaps too much debate in jurisprudence is at the level of the village grocery store theory. Consider, for example, the fondness for references to "little old ladies" and to the man who rides the local omnibus. This sort of homeliness characterizes many opinions on crime policy and legal philosophy.

<sup>4</sup> T. SELLIN & M. WOLFGANG, *MEASUREMENT OF DELIQUENCY* (1964).

Theories of "just deserts" propose that the severity of the penalty should match the seriousness of the crime, but even according to these theories, the measurement of seriousness must include some concept of culpability, an offender-related characteristic. Indeed, a crime ceases to be defined as such if the culpability of the offender is reduced to zero. But such reduction of culpability does not, or does not greatly, modify the seriousness of the harm done. The transition from crime to harm and the relationship between the concepts of culpability and seriousness need greater consideration and research.

#### IMPROVEMENTS IN PREDICTION

There are many reasons why the strategy of avoiding predictive statements may not be realistic or even desirable. If one accepts this position, it is necessary to confront the problem of false positives and consider what is ethical under conditions of uncertainty. The replacement of probability by some subjective certainty is not a satisfactory approach.

First, one should estimate the magnitude and probable impact of the false positive prognosis, both upon individuals and upon the social and legal system. The present position is that for every person correctly identified as dangerous (likely to commit another crime against the person), six others will possess the same predictive profile. This was the conclusion of a very thorough and intensive testing involving a large sample of young offenders.<sup>5</sup> Given this background, one can consider whether this level of precision can be increased and, in addition, what other modifications can be made to deal with the difficulties arising from imprecise judgments.

It is quite probable that the precision of prediction methods can be improved significantly. There are three areas where it would be necessary to invest effort: (a) the basic data, (b) methods of input of basic data to analytical systems, and (c) the analytical systems.

#### THE BASIC DATA

The data used in making predictions can give rise to several problems. A first problem arises from the fact that existing case papers, the basic source documents for information used in predictive studies, do not seem to have the accuracy necessary to

<sup>5</sup> Wenk & Emrich, *Assaultive Youth*, 9 J. RESEARCH CRIME & DELINQUENCY 171 (1972).

withstand analyses by means of the more powerful methods. The information may be mixed with "noise" as well as redundancy. It therefore may be worthwhile to explore the common kinds of recording errors and how they influence predictions based on case papers.

A second problem arises from the fact that some items of information may be predictive, but "undesirable" for inclusion in an analysis. Race, for example, may be such an item. Any characteristic that the individual cannot change voluntarily may be regarded as suspect on ethical grounds. The correlations may reflect the position of the individual in the "real world" and include factors quite independent of the criminal justice processes. Data obtained in criminal justice research may reveal injustice that cannot be remedied by any action within the criminal justice system. The criminal justice system is not operating in a perfect society. Where data problems arise from these sources, one must ensure that legal and ethical considerations are permitted to outweigh considerations of efficiency.

A third problem arises from the fact that some improvements in predictive power may require the use of information that causes an unjustifiable intrusion upon the personal privacy of an individual. But it is also possible that where offenses have been proven against an individual (prediction of recidivism), some of the rights safeguarding the privacy of personal information are diminished. This is a matter that jurisprudence must decide.

#### METHODS OF INPUT (CODING)

Methods of input raise two problems for prediction. First, all prediction systems have used data with a fixed time base: the files have been searched for information in one operation, and these data have been coded as information input for analyses. Dynamic procedures of data recording may have potential for more efficient prediction. Where individuals are incarcerated (or in mental hospitals), it is possible to obtain data on transitional states. The problem with this is that the cost of such data collection, as well as probable ethical objections, raises concerns that may outweigh the probable increments in predictability.

A second problem stems from the fact that some important information may be lost by coding processes which tend to make implicit assumptions (*e.g.*,  $A + B = B + A$ , where *A* precedes *B* in time). Coding stage assumptions such as additivity and transitivity are not removed by analytical methods that avoid such assumptions.

#### ANALYTICAL SYSTEMS

Research has been directed towards refining the statistical methods of analysis, and work in other fields of application has provided new techniques. The results, however, have been disappointing. Little or no difference can be observed between the power of quite sophisticated methods (*e.g.*, log odds, discriminant function) and very simple systems (*e.g.*, point allocation as in the Guidelines of the United States Parole Commission and unit weights as used fifty years ago). It is possible that this result is due, in part, to the quality of the basic data; simple methods are more resistant to "noise" in the data base. Clearly, this problem needs investigation, which can be done rather simply and inexpensively through the use of simulation methods.

Although it is known that all methods of prediction provide estimates of approximately equal predictive power, the relationship between the methods as they apply in individual cases has not been investigated. The different methods of prediction correlate quite highly with each other, but not perfectly. Thus, there must be some proportion of cases predicted as "failures" by one method but as "successes" by another. It is possible to guess at the nature of these differences through the use of mathematical theory, but a thorough practical examination of the matter seems long overdue.

#### SOME ADDITIONAL PROBLEMS IN PREDICTION AND DECISION

The prediction of recidivism of offenders has been subject to a wide range of error. But a much greater accuracy has been obtained in the prediction of the decisions of authorities in the criminal justice system (*e.g.*, judges, parole officers, probation officers). Why decisions about offenders (such as sentencing and parole revocations) have proved more predictable than decisions by offenders (to commit crime) is unknown. A cross-analysis of data involving samples of these two classes of predictions has not been undertaken. Indeed, there is little research specifically directed at methods of or issues in prediction. What is known about prediction has arisen mainly from studies in which prediction methods were incidental to some other focus. Thus, an investigation devoted solely to methods of prediction might prove worthwhile.

Many authorities assume that if outcome could be predicted with reasonable accuracy, it would be a simple matter to determine the best course of action. But it is questionable whether improved prediction techniques would provide useful infor-

mation in many circumstances. In the early days of prediction in criminology, it was thought that if parole boards had prediction tables, this would assist their decisions. But parole boards did not make use of the available methods. The decisions made by parole boards were concerned with issues other than "mere prediction of recidivism." This became clear in the work that led to the development of Guidelines for the United States Parole Commission. While the guidelines include a predictive element, it is the lesser of the two major dimensions considered; the main one being the seriousness of the instant crime.

Modern decision theory and related practical methods can assist in decisionmaking where the objectives are clearly stated. Prediction methods may be useful or even essential as a subset of other analytical techniques. In this way, it may be possible to develop more efficient and ethical rules of decision and procedure. The main issue today is not how to make predictions (the techniques of prediction are known, and there already are good ideas for improving present methods), but rather

why to predict and when. An answer to the question of why to predict will help answer the question of what to predict.

It also may be desirable to simulate the conditions of decisionmaking where decisionmakers are required to respond to information controlled for type, probable error, and situation. Prediction technique should not be seen as something that will stand up on its own. The decision environment in which the methods of prediction are to be embedded is also an essential element of the program of research and assessment that is now required.

One final question seems to be of outstanding importance. The question is whether prediction should be considered in the disposition of offenders. This question is related to many subquestions that might challenge the relationship between ethical concerns and probability or degrees of belief. But in the final analysis, the theory of "just deserts" does not appear, either practically or ethically, to have disposed of the necessity of prediction.