Chapter 3

New Technology for Decisionmaking: Social Sciences and Computers

In social sciences (including cognitive and behavioral sciences), research is increasingly resulting indirect and rapid practical applications that have discernible effects on social institutions and behavior and the life of individuals. In this regard, the social sciences are now following the model of the physical and biological sciences. Social science research results, expressed most often in the form of statistical probabilities, generalized observations, or theoretical formulations, are used in developing computer models and simulations that are in turn used for planning, decisionmaking aids such as formal guidelines, and resource allocations. In law enforcement and administration of criminal justice, this coming together of developments in social science with advances in computer hardware and software is already having profound effects by shifting the emphasis toward science-based expertise versus experience, pragmatism, and trial-and-error as the basis for processes and procedures.

In the area of criminal justice, new developments in social science, embodied in predictive models and guidelines, may have effects at least as significant as the effects of applications of physical and biological sciences. If properly applied, they have much potential for reducing the undesirable effects of excessive discretion and variability in decisionmaking, which often become discriminatory. But one risk is that they will make the process too rigid or mechanical. Another risk is that these social technologies could be misused in discriminatory ways. They are developed on the basis of information about patterns of behavior across large groups or populations. They should be treated with care in dealing with individuals.

A third concern is that reliance on science and technology may encourage decisionmakers to think of people only as anonymous "offenders" or impersonal "cases."

The criminal justice system operates during different stages of the process at different government levels. Law enforcement is generally a municipal or county function. Prosecution usually occurs at the county or district level. Corrections is usually a State function. Probation decisions are made at either the State or county level, sometimes by the judiciary and sometimes by an executive branch agency.

Officials in law enforcement, prosecution, the courts, corrections, and probation have to decide whom to investigate and prosecute, who is too dangerous to be allowed bail, who might flee to avoid prosecution, or who might commit new crimes if given parole. At each stage they must exercise discretion. Officials have increasingly come to rely on criminal justice research to assist in making these decisions.

Police have the broadest range of discretion in determining whom they will arrest and formally charge with a crime. From among those arrested, prosecutors decide whom they will bring to trial and the number and type of charges they will pursue.[1] The courts subsequently decide the fate of those brought to trial, while corrections deals with those who have been found guilty or have pleaded guilty and have been sentenced by the courts.

The whole process, a flow of offenders from one agency to the next, ties these functionally and structurally distinct agencies into a coherent whole that is our "system" of justice. While this channeling process successively reduces the number of people over whom authority is exercised and decisions are made, each agency retains considerable discretion.

[1] Prosecutors frequently also have the power to empanel grand juries to investigate crime as well as to initiate prosecution from private complaints. F.W. Miller, *Prosecution The Decision To Charge a Suspect With a Crime* (Boston, MA: Little, Brown & Co., 1970).

The exercise of discretion within the criminal justice system has traditionally been hidden from public view, guided only by the general principles contained in Federal and State constitutions, laws, historical practice, and the intuition of the decisionmaker at each stage. There are many problems associated with the exercise of broad and virtually unfettered discretion. One is inconsistency, both across cases with the same decisionmaker and across different decisionmakers. Those who make decisions are not often required to state why they decided how they did, and what factors they considered. Nor are they required to establish procedures that consistently and accurately measure those factors.

Broad social values determine the variables considered relevant in reaching decisions. At various times in American history, social policy toward criminals has emphasized:

1. retribution and punishment,
2. rehabilitation, and
3. incapacitation or incarceration (keep them off the streets).

With rehabilitation, prediction of future behavior is important both in designing the penalty and judging its probability of success. If retribution governs the administration of justice, predicting future behavior becomes unimportant; the penalty should be that which fits the crime committed (the criminal's "just deserts"). Where selective incapacitation is the controlling social policy, predictions of future behavior are more important, for the objective is to isolate those who are dangerous.[2]

The daily administration of justice thus necessarily entails a considerable amount of prediction of behavior.[3] When one predicts that an offender is dangerous and in fact he is not (a false positive), the consequence is injustice, without reducing the likelihood of future crime. Prediction of success on parole for an offender who subsequently commits a crime (a false negative) fails to prevent additional crime and thus creates a new injury.

[2] Norval Morris and Marc Miller, U.S. Department of Justice, National Institute of Justice, "Predictions of Dangerousness in the Criminal Law," Research *in Brief*, March 1985.

[3] S.D. Gottfredson and D.M. Gottfredson, "Accuracy of Prediction Models," *Criminal Careers and "Career Criminals,"* vol. 2, A. Blumstein, et al. (eds.) (Washington, DC: National Academy Press, 1986), pp. 212-291, at pp. 219-221.

PREDICTIVE MODELS

A number of predictive models have been developed to help in police investigations, or in allocating limited police resources across competing needs and priorities. The Police Executive Research Forum has developed a model to predict which burglary cases are solvable, using a salient factor index developed through computer analysis of old case files. The developers claim 90 percent accuracy. The Illinois Criminal Justice Information Authority is analyzing historical data on crimes in specific communities to develop methods of predicting their incidence and location.[4]

Much research is focused on predictors of criminal recidivism. These studies generally focus on such factors as prior criminal history, age, race, marital status, place of residence, employment, and other demographic variables. Unfortunately, both newspaper reporters and the general public are often either uninformed or careless about the differences between correlation and causality. It then becomes easy for conclusions to be misused in formulating public policy, resulting in discriminatory actions against some racial, ethnic, or age groups.[5]

Research on recidivism increasingly is focusing on the longitudinal sequence of offenses that comprise an offender's "criminal career." A consistent finding is that a small core of

[4] *The Compiler*, the newsletter of the Illinois Criminal Justice Information Authority, vol. 7, No. 3, fall 1986.

[5] For a thoughtful and subtle analysis of this issue, see Daniel Patrick Moynihan, "Social Science. and the Courts," *The Public Interest, No. 54*, winter 1979, pp. 12-31.

recalcitrant and very active offenders are responsible for a disproportionately large share of crime. In 1986, a National Research Council Panel reported that "the targeting of high-rate offenders" could produce modest reductions in crime. It recommended that all criminal justice decisions give greater weight to information about juvenile court records, prior criminal activity, and evidence of serious drug use.[6] This panel found that age, race, and sex were not very helpful in distinguishing the career criminal from other offenders.[7]

The real dilemma nevertheless is that in some predictive models, socioeconomic status, race, age, and similar variables have been shown in the aggregate to be useful surrogate indicators; their use may violate sound social policy and constitutional doctrine, but their removal may weaken the usefulness of the models.

These findings have significant policy implications, particularly when considered in light of the burgeoning prison populations that today confront most States and localities. The number of prisoners housed in State and local prisons has significantly outpaced capacity.[8]

In an effort to reduce crime in the most cost-effective way, some jurisdictions are developing innovative strategies for apprehending and prosecuting persistent offenders, based on the models for predicting recidivism. The Repeat Offender Project of the Washington, D.C. police department is one example of offender targeting in which the police concentrated investigative resources on apprehending offenders with characteristics indicating a high probability of repeated offenses.[9] The project is generally considered to have proven effective. The police department worked closely with the U.S. Attorney's office and the American Civil Liberties Union to ensure that their tactics met constitutional standards.

If the police in any way discriminate, for example, by enforcing a local ordinance only against members of a certain minority group, this enforcement would violate the constitutional guarantee of "equal protection of the laws."[10] In regard to both law enforcement and administrative rule-making, statistical proof of discriminatory effect is usually relevant but rarely determinative, although where the statistical proof is overwhelming it may be sufficient to establish a prima facie case. The critical question is whether those who make decisions are using some form of suspect criterion and thereby establishing a classification within the law or its application.

It is more difficult to show such intent on the part of legislative law-making. The Supreme Court has held that a criterion for government employment, such as a score on a written test, is not necessarily discriminatory even if it eliminates more candidates of one race than of another.[11]

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[6] A Blumstein, J. Cohen, J. Roth, and C. Visher (eds.), *Criminal Careers and "Career Criminals,"* vols. 1 and 2 (Washington, DC: National Academy Press, 1986); A. Blumstein, D. Farrington, and S. Moitra, "Delinquency Careers: Innocents, Desisters, and Persisters," in M. Tonry and N. Morris (eds.), *Crime and Justice: An Annual Review of Research,* vol. 6 (Chicago, IL: University of Chicago Press, 1985); P. Greenwood, with A. Abrahamse, *selective Incapacitation* (Santa Monica, CA: Rand Corp., 1982); J, Chaiken and M. Chaiken, *Varieties of Criminal Behavior* (Santa Monica, CA: Rand Corp., 1982); J. Petersilia, "Criminal Career Research: A Review of Recent Evidence," N. Morris and M. Tonry (eds.), *Crime and Justice: An Annual Review of Research,* vol. 2 (Chicago, IL: University of Chicago Press, 1980); and J. Petersilia, P. Greenwood, and M. Lavin, *Criminal Careers of Habitual Felons* (Santa Monica, CA: Rand Corp., 1977).

[7] A von Hirsch, *Doing Justice (New* York, NY: Hill & Wang, 1973), p. 107; Twentieth Century Task Force on Criminal Sentencing, *Fair and Certain Punishment (New* York, NY: McGraw-Hill, 1976); N. Morris, *The Future of Imprisonment* (Chicago, IL: University of Chicago Press, 1974); J. Feinberg, *Doing & Deserving: Essays in the Theory of Responsibility* (Princeton, NJ: Princeton University Press, 1970); and American Friends Service Committee, *Struggle for Justice: A Report on Crime and Punishment in America (New* York, NY: Hill & Wang, 1971).

[8] U.S. Department of Justice, Bureau of Justice Statistics, *Population Density in State Prisons* (Washington, DC: U.S. Department of Justice, 1986), as reported in *Criminal Justice Newsletter* 18, Jan. 2, 1987, p. 4.

[9] For a recent review of other such programs, see W. Gay and W. Bowers, U.S. Department of Justice, *Targeting Law Enforcement Resources: The Career Criminal Focus* (Washington, DC: U.S. Department of Justice, 1985).

[10] In *Yick Wo v. Hopkins,* 118 U.S. 356 (1886) the Court held unconstitutional the enforcement of a San Francisco ordinance banning the operating of hand laundries in wooden buildings. The vast majority of such laundries were owned and operated by Chinese; it was shown that all non-Oriental launderers who had applied for an exemption from the statute had received one, while no Chinese who applied had been granted one.

[11] *Washington v. Davis,* 426 U.S. 229 (1976).

A growing volume of research is intended to aid police, prosecutors, and other criminal justice officials in deciding whom to arrest, charge, and parole. But there are ethical questions in the use of prediction. Justice must be equal and fair. It should preclude consideration of racial and ethnic variables which are beyond the offender's control, since that would violate concepts of due process and equal protection. Some scientists are said to have grave reservations about predictive models that use psychological and social factors in predicting behavior, as they might be used in criminal justice decisions.[12]

Social scientists have recently been studying the working of the jury system, a social technology that has been in use for thousands of years.[13] By means of statistical analysis and computer simulation, they can measure the effects of the demographic characteristics of jurors, their known attitudes (e.g., toward the death penalty), how jurors are chosen, and how they voted. Defense lawyers and prosecutors use the results of such research to develop elaborate strategies for maximizing the chances of winning a desired verdict.

[12]Alan J. Tomkins, "Psychology and the Constitution," *Psychology Today,* September 1987, pp. 48-50.

[13]Arnald Urken and Stephen Traflet, "Optimal Jury Design," *Jurimetrics*, Journal of the American Bar Association, vol. 24, spring 1984, p. 218.

DECISIONMAKING GUIDELINES

Other innovative tools have been developed to aid in the complex process of criminal justice decisionmaking. In setting bail judges must consider the likelihood that a defendant will appear at trial. In sentencing, judges may evaluate the danger an offender poses to society as well as his rehabilitative potential. Similarly, correctional officials and parole boards must evaluate the likelihood that an offender will commit another crime after being released from prison.

With regard to sentencing, former U.S. District Judge Marvin Frankel noted in 1973:

> We have in our country virtually no legislative declarations of the principles justifying criminal sanctions. . . [T]his is much more than an aesthetically regrettable lack. It is the omission of foundation stones, without which no stable or reliable structure is possible. "[14]

It has been widely recognized for many years that there has been great disparity in parole decisions and in the setting of sentences for similar crimes, both across jurisdictions and within most jurisdictions. Many experts and public interest advocates have pointed out that parole and sentencing decisions are often arbitrary, capricious, and unfair. As a result, innovative tools have been used to develop guidelines for bail, sentencing, and parole that have strengthened the rationality and consistency of such decisions.

The United States Board of Parole (now the U.S. Parole Commission) began to develop guidelines in 1972 that would structure and guide its exercise of discretion.[15] The first task was to model how decisions were then made in order to identify what factors were considered and their relative weights. Thus, the guidelines reflected existing practices and policies of the Parole Board.[16]

[14]M.E. Frankel, *Criminal Sentences: Law Without Order (New* York, NY: Hill & Wang, 1973) p. 107.

[15]For an account of the research project and a description of the guidelines produced, see D.M. Gottfredson, et al., ***Classification for Parole Decision Policy*** (Washington, DC: U.S. Government Printing Office, 1978); D.M. Gottfredson, L.T. Wilkins, and P.B. Hoffman, ***GuideLines for Parole and Sentencing: A Policy Control Method*** (Lexington, MA: D.C. Heath, 1978). Also see M.R. Gottfredson and D.M. Gottfredson, ***Decisionmaking in Criminal Justice: Toward the Rational Exercise of Discretion*** (Cambridge, MA: Ballinger, 1980).

[16]The Commission identified three factors as primary in considering release on parole: 1) the seriousness of the conviction offense, 2) the risk of recidivism if paroled, and 3) the inmate's institutional behavior. The offender's parole prognosis (risk of recidivism) was scored, based on variables which research demonstrated were accurate predictors of parole performance, in-

The guidelines that emerged were to be advisory in nature. The Board could decide to parole a prisoner based on factors that fell outside the recommended range, but they had to provide written explanations of why the case warranted deviation from the guidelines. This became feedback which provided information on how well the guidelines were working, suggesting areas needing possible modification.

To prevent the guidelines from becoming rigid prescriptions, the Parole Board adopted procedures for updating them on the basis of systematic, regular feedback. This created a process for changing the guidelines based on experience .17

Critics questioned the propriety of some of the variables chosen as salient factors in decisions.[18] Due process and equal protection preclude consideration of race. A prisoner's job prospects and educational level may be predictive of parole performance, but they may also be strongly correlated with race and/or socioeconomic status. Using these "racially tainted"[19] variables was seen by some critics to be ethically improper if not unconstitutional.

Guidelines have been adopted by a growing number of States over the years for dealing with parole, bail, and sentencing.[20] Congress authorized the U.S. Sentencing Commission in 1985 to create sentencing guidelines at the Federal level.[21] After 18 months of study, the nine-member commission issued its guidelines in April 1987. They are methodologically similar to the parole guidelines.[22]

Congress had provided that the guidelines would take effect automatically unless Congress intervened after a period of congressional review. The Commission can, through amendments, change or add to the initial set of guidelines. Critics say that Congress thereby delegated the power to legislate, and this is probably unconstitutional. [23]

Federal sentencing guidelines took effect November 1, 1987. The guidelines virtually eliminated Federal probation and alternative sentencing (e.g., community service or electronically monitored home arrest, which is discussed later in this report). They also provided for stiffer sentences than have been common in recent years, especially for white collar crime.

Sentencing guidelines are an alternative to both fixed sentences and complete judicial discretion. The latter results in extremely wide variations in sentences for the same crime, while the former prevents judges from considering mitigating factors or factors that might suggest a more severe sentence. With guidelines, judges retain discretion, but must put on record their reasons for not following the guidelines recommendation. Some judges suggest that this explicit rationale may make it

cluding criminal history, education, employment status, and parole plans. The guidelines were designed as a simple matrix, with offense seriousness ranked on the Y axis and the salient factor score on the X axis. The intersection of the two scores provided the commission with a suggested total amount of time to be served before release on parole.

[17] D M Gottfredson, L.T. Wilkins, and P.B. Hoffman, *Guidelines for" Parole and Sentencing: A Policy Control Method,* op. cit., footnote 16.

[18] *J. Petersilia and S. Turner, *Guideline-Based Justice: The Implications for Racial Minorities* (Santa Monica, CA: Rand Corp., November 1985); J.C. Coffee, "The Repressed Issues of Sentencing: Accountability, Predictability, and Equality in the Era of the Sentencing Commission," *The Georgetown Law Journal* 66 (1978), p. 975; and J.C. Coffee, "The Future of Sentencing Reform: Emerging Legal Issues in the Individualization of Justice," *Michigan Law* Review 73 (1975).

[19] Petersilia and Turner, op. cit., footnote 19, p. 17.

[20] L.T. Wilkins, et al., *Sentencing Guidelines: Structuring Judicial Discretion* (Washington, DC: U.S. Government Printing Office, February 1978).

[21] 28 U S.C.A. 991-998 (West Supp. 1985) [Sentencing commission established]; U. S.C.A. 3551-3586 (West Supp. 1985) [New Federal sentencing provisions].

[22] A crime is assigned a base score which is adjusted depending on a number of variables (e.g., the weapon used). The adjusted score is then located on a matrix, with the second axis determined by the previous criminal record of the offender. The result is a recommended length of sentence, expressed as a narrow range, e.g., 60 to 72 months.

[23] U.S. Sentencing Commission, *Sentencing Guidelines and Policy Statements* [submitted to Congress Apr. 13, 1987, with amendments submitted Apr. 13, 1987]; *Supplementary Report on the Initial Sentencing Guidelines and Policy Statements* (June 18, 1987). For a representative critique of the commission's work, see Statement of H. Scott Wallace, legislative director, National Association of Criminal Defense Lawyers, before the U.S. Senate Committee on the Judiciary, regarding Federal Sentencing Guidelines, Oct. 22, 1987. For a summary see H. Scott Wallace, "Congressional Abdication," *The National Law Journal,* Dec. 28, 1987–Jan. 4, 1988, p. 13.

more likely that a sentence be appealed, by suggesting strategies for attacking its rationale.

The sentencing guidelines, like those for parole, are likely to be examined closely to see whether they create "classifications" or categories of people for special treatment, thus violating constitutional guarantees of equal protection. However, a statistical showing that some groups or races are differentially affected on a statistical basis would not in itself demonstrate an unconstitutional classification.

An alternative approach is prescriptive, and seeks to develop guidelines based solely on policy choices of criminal justice officials, irrespective of past practices.[24] Minnesota, for example, developed sentencing guidelines rooted in retributive considerations.[25] They excluded predictions about the future behavior of an offender from consideration, concentrating instead on the seriousness of the offense and the offender's criminal history [the latter, however, can be seen as a predictor of dangerous behavior].

Guidelines may promote an active public examination of the purposes underlying important criminal justice decisions, of the primary objectives of our system of justice, and of acceptable methods for obtaining these objectives. The guidelines seek to reduce disparity in the administration of justice, since disparity violates constitutional rights of due process and equal protection.

The use of predictive factors in sentencing decisions made by a jury has been allowed by the Supreme Court, specifically in cases in which there was psychiatric testimony about the likelihood that a defendant would continue to be of danger to the public.[26] A decision in May 1987 appears to have fully vindicated the use of such predictions of behavior indecisions about pretrial detention under the Bail Reform Act of 1984.[27] The Court specifically recognized that Congress passed the act because of the "pressing societal problems of crimes committed by persons on release. " In these cases, however, the predictions were based on specific information about the offender as an individual rather than statistical data about groups of people. The issue of suspect categories has not yet been laid to rest.

[24] K. Knapp, "Impact of the Minnesota Sentencing Guidelines on Sentencing Practices," *Hamline Law Review* 5, (1982), p. 237. For thorough discussions of methodological issues associated with designing descriptive guidelines, see F.M. Fisher and J.B. Kadane, "Empirically Based Sentencing Guidelines and Ethical Considerations, " in A. Blumstein, et al., Research on *Sentencing:* The Search *for Reform, vol.* II (Washington, DC: National Academy Press, 1983), pp. 184-193; and R.F. Sparks, "The Construction of sentencing Guidelines: A Methodological Critique," Ibid., pp. 194-264.

[25] Minnesota Sentencing Guidelines commission, *Preliminary* Report *on the Development and Impact of the* Minnesota Sen*tencing Guidelines July, 1982* (St. Paul, MN: Minnesota Sentencing Guidelines Commission), p. 5.

[26] *Barefoot* v. *Estelle*, 463 U.S. 880, 77 L. Ed. 2nd 1090>103 S. Ct. 3383 (1983).

[27] U.S. v. Salerno, 107 S. Ct. 2095, 55 U. S.L.W. 4663 (1987).

ARTIFICIAL INTELLIGENCE

Artificial intelligence is the computer emulation of human intelligence. Significant progress toward application has been made in four areas:

- natural language processing,
- computer vision,
- expert systems, and
- problem solving and planning.

After 30 years of research and development, artificial intelligence (AI) has begun to yield commercially available products in the form of expert systems. These are computer pro-

[28] For a comprehensive review of artificial intelligence, see A. Barr and E. Feigenbaum, *The Handbook of Artificial Intelligence*, vols. 1-3 (Stanford, CA: HeUrisTech Press, 1982). Also see R. Forsyth and C. Naylor, *The Hitch-Hiker's Guide to Artificial Intelligence* (London: Chapman& Hall/Methuen, 1986); H.C. Mishkoff, *Understanding Artificial Intelligence* (Indianapolis, IN: Howard W. Sams & Co., 1985); W.B. Gevarter, *Intelligent Machines: An Introductory Perspective of Artificial Intelligence and Robotics* (Englewood Cliffs, NJ: Prentice-Hall, 1985); D. Peat, *Artificial Intelligence: How Machines Think* (New York, NY: Baen Enterprises, 1985); and P.H. Winston and K.A. Predergast (eds.) *The AI Business: Commercial* Uses *of Artificial Intelligence* (Cambridge, MA: The MIT Press, 1984).

grams or software that embody human expertise in a particular domain of knowledge. They are, in a figurative sense, the cloning of an expert's methods of problem solving.

There are three principal components common to most expert systems: a knowledge base, an inference engine, and a user interface. The knowledge base contains the system's declarative and procedural knowledge, including rules of thumb and procedures for attempting to solve a given problem. The inference engine controls the system's operation by selecting the rules to use, accessing and executing those rules, and determining when a solution has been found. The user interface allows communication between the system and its user. Most use natural language processing.

Some experts believe that expert systems can greatly benefit criminal justice operations, through their ability to institutionalize knowledge and to disseminate rare investigative expertise. Experts in fields such as criminal profiling,[29] forgery, arson, serial murder, and rape investigation can have accrued as much as 30 years of experience in problem solving. When those experts leave a criminal justice agency, they take their expertise with them. Expertise is more than formal knowledge of facts; it is judgment, memory, and ability to compare and synthesize. It is hoped that expert systems can extend the lifetime of personal expertise and the range of its use beyond a particular institution. Small agencies with less experienced people or with no specialists will benefit from transferable expert system programs.

Examples of expert systems being developed for use in criminal justice are:

- *Criminal Profiling for Serial Murder and* Rape.–Under development by the FBI's Behavioral Science Investigative Support Unit at the FBI Academy in Quantico, Virginia.[30]
- *Serology Analysis.*–Under development by the California Department of Justice.
- *Narcotics Interdiction.*–Under development by the FBI Technical Services Division.
- *Counterterrorism.* —Under development by the FBI's Technical Services Division.
- Name *Searching System for Various FBI* Databases.–Under development by the FBI's Technical Services Division.
- *Organized Crime and Labor Racketeering--Called* "Big Floyd" and "Little Floyd," these are being developed by the FBI's Technical Services Division.

Except for Big Floyd, these expert systems have not yet proved their feasibility and usefulness, but their developers have high hopes for them.[31] Expert systems could be particularly useful in FBI investigations because, frequently, the most effective investigators are promoted out of investigation and into management positions, and this attrition is compounded by early retirement and other factors. In addition, the Bureau relies heavily on the expertise of local law enforcement officers in the Bureau's narcotics and drug interdiction programs. Expert systems may be a way of capturing and institutionalizing their knowledge before they return to their own jurisdictions.

[29]For a general discussion of criminal profiling, see B. Porter, "Mind Hunters," ***Psychology Today***, April 1983, pp. 44-52.

[30]**Interview with W. Tafoya,** Behavioral **Science** Investigative Support Unit, Federal Bureau of Investigation, Jan. 5, 1987; interviews with W. **Tafoya,** D. **Icove,** and R. **Rabussen, Behavioral** Science Investigative Support Unit, Federal Bureau of Investigation, Jan. 15, 1987. For discussion of **crimin**al profiling and the expert system being developed by the FBI, see J. E. Douglas and **A.E.** Burgess, "Criminal Profiling: A Viable Investigative Tool Against Violent Crime, " ***FBI Law Enforcement Bulletin*** 55, December 1986, p. 9; and **D.J. Icove,** "Automated Crime Profiling, " ***FBI Law Enforcement Bulletin 55,*** December 1986, p. 27.

[31]**The** Institute for Defense Analyses with the FBI developed "Big Floyd," a labor racketeering expert system, which is able to access and use the data contained in more than 3 million records in the FBI Organized Crime Information System. The program, which is named for Floyd Clark, head of the Criminal Identification Division, is a very large relational database based on an "entity relation model. " Relevant statutes, such as RICO, are also in the system. An investigator can start with a person or organization, look at the statutes and their constituent parts, and ask questions such as: "Do I have enough evidence to charge this person/organization?" The program will analyze **all** data pertaining to an offender/organization and come to a conclusion. If there is not sufficient evidence, the program will suggest, for example, the kind of additional information that ***is*** needed and will suggest that, given the various relationships between individuals in the database, Subject "X" is likely to have data that may implicate the suspect in crimes. The program will also suggest strategies for "turning" X into an informant,