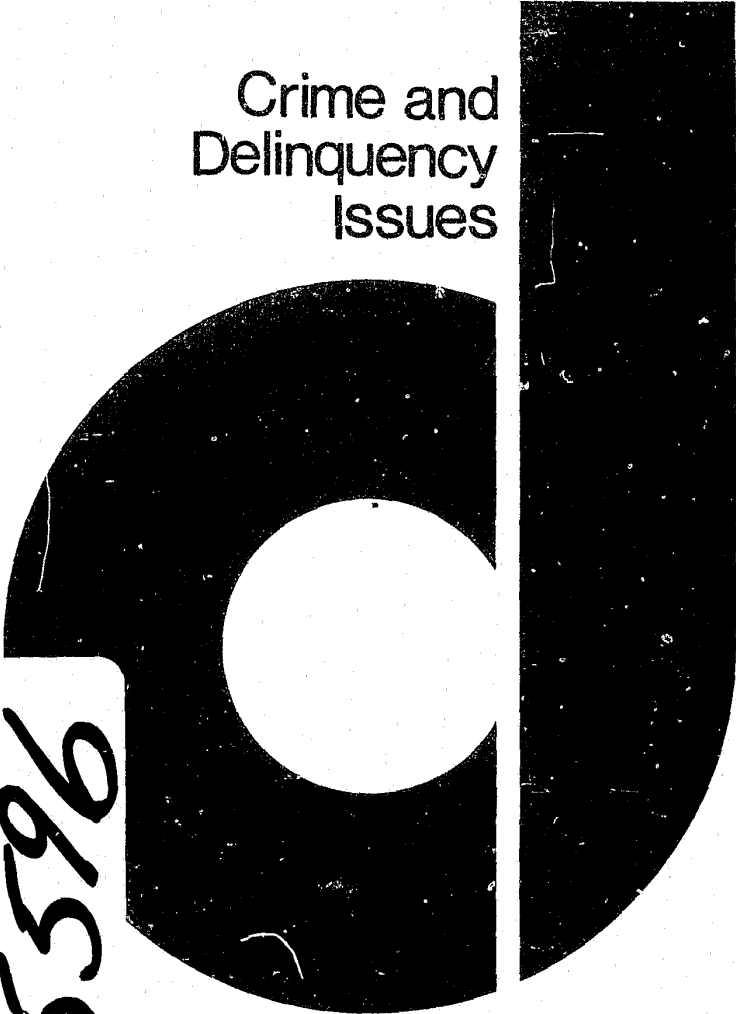


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Decision-making in the Criminal Justice System: Reviews and Essays

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CHAPTER V

Perspectives on Court Decision-making

LESLIE T. WILKINS

Two kinds of problem in relation to decision-making will be considered in this chapter. The first may be thought of as concerned mainly with the "quality" of decisions and the second with the "kinds" of decisions.

THE QUALITY OF DECISIONS

There are many ways in which decisions by the courts may be considered to be similar to other kinds of decisions. It is possible to suggest similarities and differences in terms of the nature of the process of coming to a decision which may determine its quality, and it is possible to focus upon the subject matter of concern in the decision which may influence the choice of process and its relevance.

The word "decision" often is qualified by a preceding adjective or adjectival clause. We talk of rational decisions, fair decisions, significant decisions, correct decisions, or of incorrect or unfair decisions. It is, of course, difficult to say whether any of these qualifying terms suggest any change in the decision process itself. Perhaps exactly similar procedures are used by persons who, as we see it, arrive at unfair decisions as by persons who arrive at decisions which we would classify as "fair." These considerations indicate one aspect of the decision-making processes of the courts which it will be necessary to explore. Simply and in lay language, the question is whether both good and bad decisions are arrived at by the same means, or whether a difference in process can be identified.

THE KINDS OF DECISIONS

The subject matter of decisions may be another factor in determining the nature of the decision process. As an illustrative example from the particular area of the courts, consider the two kinds of decisions:

1. the decision with regard to the guilt of the person charged
2. the decision with regard to the disposal of the offender who has been found guilty (sentencing).

Are the quality and nature of the *process* of decision-making exactly similar in the two cases? Of course, the information used must be different for the two kinds of decisions, but that is not the question. The issue is whether, given an appropriate set of information (whatever that might be), that information is processed (i.e., weighed, assessed, or manipulated) in the same ways irrespective of the nature of the end product. This indicates the second main area of concern in this chapter.

WHAT IS A DECISION?

It seems important to be somewhat more specific than we might normally be in sorting out what it is we are discussing. Every layman knows what a decision is—within limits. However, while it may be simple to say that a decision has been made, it is not so simple to discuss the process of making it. A person may know that he has decided to get married, but he may not know exactly when that decision point was reached. After the decision it is clear that it has taken place. If, for example, we could ask our bachelor every second or minute, "Have you decided yet?" at each point he could answer "yes" or "no," and we would then have a fair idea as to when the decision was made. More generally we would expect the transition from "decision=no" to "decision=yes" to be somewhat slow—like the scale which tips when the weight on one side exceeds the weight on the other. The "last straw" does not strike us as having any special weight, but it is that "straw" which "causes" the scale to tip. In this analogy it would not matter in what sequence the items were placed in the scales. The identification of the last straw is a matter of no special consequence in the process; it is, nonetheless, very important in the general result.

It will be observed that we talk of decisions in various ways. The analogy of the weighing of information as though in scales is a com-

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monplace with the special characteristic of being dignified as the symbolic representation used to represent the idea of justice. (The fact that justice is also blindfolded is an additional, but unrelated, symbolic consideration.) We also refer to decisions using the analogy to a journey—we arrive at a decision. This pictorial analogy again has a sequential reference: the distance traveled is increasing until we arrive at the point when we can say that a decision has been achieved. However, if we press these analogies to any extent it will be seen that there are many differences between that of the “scales” and “the journey.” In a journey the sequence is important, for clearly one cannot travel the last mile before completing the first. There is another common analogy which suggests that we build up a decision—an analogy with construction. Again this use of language suggests the importance of sequence, for, as everyone knows, a building must have a sound foundation and the sequence of operations is a matter of considerable importance.

Is this merely empty philological speculation? It would seem that we must ascribe similar importance to the philological analysis, when the words we are considering relate to a “process” carried out by man, as when the words apply to objects which may be seen, touched, and directly experienced with the senses. We know, for example, that the peoples who live in the frozen regions of the north have many more words by which to describe “snow” than we have in the English language. This greater differentiation is necessary in order to communicate the conditions which are important to their day-to-day work or even to survival. In English usage we qualify the word snow by adding adjectives “hard powder,” “soft wet” and so forth, as anyone who has waxed cross-country skis with the various color-coded waxes knows all too well! The fact that we have only one word for “decision,” yet use a variety of analogies which present quite different images, suggests that we are somewhat uncertain as to what a decision is. If the processes of decision-making can vary as much as the analogies we use, then, perhaps there are many decision processes? If there are many different decision processes, when do we use which kind? Do some people use one kind and other persons a different kind all the time, or do we select the decision-making process according to the nature of the problem? If we select a different process of decision-making for each kind of problem, can we say anything about how many kinds of processes exist and how many kinds of problems it is necessary to distinguish in order to match the process with the problem? In our specific case, is the decision regarding determination of guilt a different decision from the decision regarding the disposition of the offender by sentencing?

The fact that we do not have more than one word for the concept of a decision leads us to treat all decisions as alike, unless we can specify otherwise. A decision is a decision no matter what the subject matter. But consider two examples of a decision (Wilkins 1973). The first, the President decides to go to war; the second, he decides to wear a pink shirt. Is the difference between the two decisions only in terms of the amount of consideration given to each? Is there a difference in the process as well as in the kinds of information which are considered? Or, to put it another way, is the difference only in terms of the time and effort given to the consideration (quantity) or are there differences in the manner or process (quality) of the consideration? We must assume, since it is necessary to use the same word—decision—to describe the decision to wear a pink shirt as we use to describe the decision to go to war, that whatever differences we may postulate are not so great as to have demanded the invention of a different word as a token of that difference. If different qualities of snow require differentiation in the verbal coding, then, had there been a noticeable difference, surely different decisions would have been similarly discriminated by modifications of the linguistic code.

CONSEQUENCES AND DECISIONS

While there is nothing which can indicate the nature of the decision-making process in the words used to denote that process, we would normally wish to discriminate between "wars" and "pink shirts" in terms of the consequences of the decision. In other words, we seem to assume that the decision has been made and to have regard to the probable outcome. Some decisions may not have serious consequences whereas others might. But we are still set with the same term for the decision process. It might seem that if we knew precisely how decisions were made where these have trivial consequences, we might consider the same facts to apply to decisions with serious consequences. But somehow it seems absurd or insulting to suggest that if we knew the manner in which the President went about weighing the decision to wear a pink shirt, we might be able to infer something about the ways in which he would weigh the information concerning the decision to go to war.¹

¹Note that the same question posed in inverse order seems to be a different question: If we knew how the President weighed the information with regard to questions of going to war, we might make reasonable inferences about how he would decide to wear a pink shirt. If, however, there is a correlation between the two processes (or if they are identical) whether the consequences are serious or trivial,

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The postulation of widely different consequences (as we see them) leads almost intuitively to the rejection of the idea of an identity of process in the decisions. We tend also to resist the suggestion that while the processes may be similar to each other, in the more serious cases there may be much more of the same method in use.

We seem intuitively to require a qualitatively different procedure to satisfy our feelings about the decision-making processes when the consequences are serious.

Each key word which it becomes necessary to use as we proceed with the analysis of decision-making has a tendency to crumble under the pressure we must place upon it. We have noted that there are several analogies which are commonly used in discussing the term, "decision," and that this suggests that the meaning of the word is uncertain or that (as with our word "snow") there are many different classes of process covered by the one word. We have tried to identify possible differences by noting that the outcomes for decisions may differ and that this may be known to some degree before the decision process is begun. We have noted that there would seem to be a preference for a belief that there are differences in the quality of the decision processes themselves which are related to the postulated seriousness of the outcome. It will be necessary to take up one or two more concepts and to try to put these together with those already dealt with before we can begin taking apart the complex set and once again reduce our concern to the single idea of a "decision." This elaboration will (it is hoped) be analogous to the lepidoptera (caterpillar); the overlaying of the chrysalid and the emerging of the imago. The concept of "decision" with which we shall emerge may not be brighter or more beautiful, but it may be more useful to us in considering how decision processes may be studied and improved. It may be necessary to know with more precision what it is we are talking about if our task is to seek improvements.²

then clearly it does not matter in which way the sentence is constructed. The "less serious" cannot be more strongly correlated with the "more serious" than the inverse. If we know the process for making a serious decision (decision with expected serious consequences) we may feel more relaxed about making inferences about trivial decisions. In the one direction we require a higher level of certainty of the correctness of the inference than we require in the other. We are making decisions about our postulated decision-maker and the kinds of decisions we consider him to be making. The consequences *for us* of our decisions about *him* lead to different levels of requirements.

²This is not so much an ontological question as it is a concern to find an operational definition of "decision" and "decision processes."

INFORMATION SEARCH AND DECISION-MAKING

The making of decisions, no matter which meaning or analogy we may select to describe this process, implies a search for and a dealing with information. We weigh information and come to a conclusion, we balance the probabilities, or we may cut off discussion and force a decision. Indeed the idea of a "decision" as a termination of a process is implicit in many of the words we use, as it is in the etymological basis of the word "decision" itself. (Webster relates "decision" to the Latin *decisio*—a cutting off.) The idea of decision-making as a process is, of course, quite different from the idea of the decision as the termination of a prior process. It seems that we should know with which kind of phenomenon we are dealing.

The idea of a decision being made in the total absence of any information seems absurd. A person may act blindly in the absence of any information, but that action can hardly be described as a decision. On the other hand, if a person says that he wishes to continue to search for more information or to consider more information we would not normally characterize his state as having made a decision. He may have made an "interim decision"—but this is a provisional termination in the middle of a process. It is possible to use words in this way, but we are, it seems, postulating that at the "interim decision" stage the person is behaving as though he had seen all the information he needed—he is not in the state of having made a decision, but he is pretending that he is. The pretended situation is, then, the one we should consider as relevant to the definitions we will use.

When we think about decisions, we think of information. We assume that a quantity of information exists, in our imagination or memories or in records, files or computer tapes, or we may make direct observations (i.e., collect information) at the time we make the decision. We may, for example, observe the color of the shirt while we are also thinking about the kinds of situations we will face during the day and we will "decide" in the light of this information. We have a strategy for the search for information. We may look, we may call for a file, we may ask somebody some questions or merely stop and think. Having obtained the information, or at the same time as we are collecting it, we are processing it in some way. That is, we are relating one item to another and trying to put together the various pieces while attaching some significance to each item.³

³See Burham, R.W. in this volume for discussion of this process.

We may, in general, exercise some selection over the order in which we seek for specific items or information—what we want to see first, second or later, and, of course, we may terminate the search at any point which seems reasonable to us in the light of the information we have already obtained. We do not wish to go on collecting data when we are ready to cut off (conclude) the process.

It would seem reasonable to postulate that the strategy of information search is closely related to what we mean by "decision-making." Indeed it seems that the decision is merely a point at which we are prepared to stop searching for more data. Clearly, if we are taking a behavioral approach we might say that a person could be said to have made a decision when we observed that he stopped seeking for information. There is, however, the further point of considering the data. It may be that the processing (consideration) takes place at the same time as the collection, so that the termination of collection is the decision. It may be, on the other hand, that the processing continues after the termination of the collection of data. There are mental processes involving recall of data previously seen (an internal retrieval system) and also some form of assessment, the nature of which may vary both from person to person and from decision to decision. There is, of course, no way for us directly to observe the process of coming to a decision (i.e., of assessing the information and combining it). We may observe outcomes of decisions where the information available is controlled in some ways and make guesses as to the nature of the process. We may identify other kinds of processes which seem likely to be similar to those which the human intelligence carries out. We shall return to some of these considerations later. First we must consider the termination of the information search-and-assess phase.

CONFIDENCE IN THE DECISION

It will be remembered that when we were discussing the "trivial decision" (to wear a pink shirt) and the "serious decision," we raised the question as to whether a different process for information search and assessment might characterize decisions with different levels of consequences. It is, of course, absolutely obvious that the same kinds of information cannot be used for quite different decisions, but this does not necessarily imply that the search and retrieval methods we adopt are different, nor that the ways in which we "weigh" the information are any different. We noted that in the case of the serious decision, a higher level of confidence in any decision would be

required by any decision-maker and expected of him by any observer. This analysis needs to be qualified. It is possible to have a high degree of confidence in a decision which is just as wrong as one in which we have no confidence. Clearly, when we ask of the decision-maker that he be more confident before coming to a serious decision, we do not have in mind his subjective happiness with his decision, but some concept of the probability that the decision is correct.

The move which we have now taken into probability statements is an important one. We are saying in effect in the previous paragraph that while we expect the decision-maker to have a higher degree of belief in the correctness of any serious decision he may make, this, of itself, is not enough. We may hope that the higher degree of belief—which may be referred to as the *subjective probability for the decision-maker*—bears some close resemblance to the idea we may have of the objective probability of a correct decision.

In some cases we may be prepared to make a decision even though our level of confidence is not very high (our feeling that the decision may be wrong is not totally allayed), while in other cases we would make strong efforts to increase our level of confidence before terminating the information search or assessment processes. It appears that we may postulate an association between the degree of confidence which we wish to see in a decision and the consequences of that decision. We require a higher degree of confidence where we postulate large differences between alternative outcomes which rest upon the decision we, or others, are about to make. (This does not imply any differences in the nature of the decision processes which we might adopt). The requirement of confidence relates to the consequences (for us); that is, it concerns a projection into the future of possible outcomes to alternative decisions (one of which may be a refusal to decide). Confidence is not related to the methods of operating upon the data.

CONFIDENCE AND COMPETENCE IN DECISION-MAKING

How may a decision-maker seek to increase his level of confidence that a decision he may make is correct? It may be expected that in some way or another he will do more work on the problem. We might expect the level of confidence in a decision to increase as the amount of work done on the problem increases. It certainly seems unlikely that a decision-maker would express more confidence (for a decision

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of the same complexity) in a case where he had done less work. The amount of work done, however, would not only relate to the degree of confidence required, but also to the perceived difficulty of the task. If a task is seen as more difficult than another, then more work would be expected to be done to achieve the same level of confidence. Thus we would expect an association between the degree of confidence and the perceived degree of difficulty of the task, so that the more difficult the task the lower the level of confidence for the same amount of work. But the relationship may not be quite as simple as that. Some experimental evidence to be examined later suggests that a different explanation may be necessary.

Let us take up the question from the point of information search. A decision-maker can, in all normal decision-making situations, terminate the information search whenever he wishes—presumably when his confidence level has reached a point which he considers is commensurate with the consequences of his decision. It is also possible to terminate the information search when the level of confidence is low, thus avoiding unnecessary work. Unless I am particularly fastidious, I would not spend much time seeking out and considering information relating to which shirt I should wear; unless, by chance, I was going for an interview for employment and I knew the interviewer to be unduly particular about shirt colors. In the first part, the level of confidence required is a matter of the personality of the decision-maker (fastidious about dress or not). In the second part it is related to the consequences for the decision-maker, as he perceives them to arise from the environment.

The wish, or requirement, to raise the level of confidence in a decision seems to be a common need. Indeed, it seems likely that under normal circumstances the search for and retrieval of information, as well as its processing in the mind, will not be terminated (i.e., in our terms, a decision will not be made) until a level of sufficient subjective certainty is reached. Whatever the situation in this case, we have not moved toward any resolution of our doubts as to whether, as a decision-maker approaches a problem which he sees as likely to have serious consequences, he adopts a different strategy of information search from the start, or whether the process of search is similar in all cases. Furthermore, if there is only one strategy of information search common to all decision-makers for all kinds of decisions, there is still the question as to whether the information obtained is dealt with (i.e., weighed, considered, or processed) in the same ways by all persons for all kinds of decisions.

It may seem that these are interesting questions to a psychologist but that they have no practical importance to judges or other deci-

sion-makers in the field of criminal justice. It is true that at the present time these questions may be little more than interesting, since each judge can determine for himself exactly how he will proceed, and he can require the probation service to pass to him information (such as the pre-sentence report) in almost any form he personally prefers. But the very large variation in the decisions made by courts are receiving more and more critical comment, often by the courts themselves (Frankel 1973). If social scientists are to assist judges and other decision-makers in the criminal justice field, and particularly if the facilities of computers are to be harnessed to the problems of sentencing, then questions of the kind we have posed above must be answered. If this is not done, and if some kinds of reasonable answers cannot be obtained, then there is a good chance that money will be wasted in providing apparatus of information retrieval for courts which is not suited to their needs. If the level of confidence required in a decision is, as we have suggested, related to the seriousness of the consequences of the decision, then perhaps there may be differences in the decision-making processes in relation to persons accused of serious or less serious crime.

DECISIONS ABOUT PERSONS

Judges, and indeed all persons in the criminal justice area as well as in many other areas, talk of making decisions about persons. We know, of course, what this phrase means, and it certainly does not mean what it says. Decisions cannot be made about individuals, but only about information about individuals. The individual may be put into prison, sent home, or other, as a result of a decision made with respect to him, but the basis for the decision can only be information which the court has about him, in some form or another. Obvious as this may seem, the consequences of this simple elaboration of the generally used language are seldom recognized. If we recognize that decisions are made about the information we have about a person, then we must accept that that information is limited in quantity and may have some deficiencies in quality.

It is often claimed, despite the limitations of the information, that decisions about offenders are decisions about unique individuals. This is in some measure true, in that it is reasonable to describe every person as "unique." But it does not follow that our decisions can be as differentiated as are the persons involved. If we wish to consider each individual as unique (as indeed he is) and to claim to deal with him as such, then it follows that there is an infinity of relevant bits

of information, since each further piece of information we obtain about the person has a probability of marking him out as different from somebody else who was similar except for this particular item of information. How many items of information do we need to be able to say (prove?) that a person is unique? Since there are an infinity of persons (or a number large enough to be considered to be infinity) then there must be an infinity of information. Even if we could measure only one thing, but accurately enough, then we could describe each person as unique in terms of only one piece of information—say, his exact height or his exact weight. There is, of course, no point in attempting to measure height or weight so accurately that each person can be described uniquely. We use a scale of measurement which is adequate for what we want to do: fit a suit, decide the height of a table, length of a bed, or whatever. In any event, and in all actual cases, the number and variety of the decisions we can make are limited, and we are wasting our time (if nothing else) if we seek information which exceeds that required to do the job. The job may be the placing of a person in a category which we see as most appropriate for him, where clearly the number of categories (or types of decisions) cannot extend too widely: certainly not to infinity! One argument against the claim that decisions must relate to the unique individual is that if we were to match the unique individual to our decisions, we would require a potentially infinite set of different (unique) decisions. But this is not the strongest argument against the absurd claim of some decision-makers to make decisions about individuals. If each person is unique, and if each decision we make about persons is also unique, then we can never learn anything from experience. No unique or once for all event can be any guide to policy (Wilkins 1962). We can only use information as a guide when we are prepared to consider similarities, not when we are emphasizing differences (uniqueness) to the exclusion of all other considerations.

The claim that every person is unique is, of course, reasonable. It serves also as a moral basis for our behaviour toward persons, for if we consider each individual as unique, then we impute to him a level of autonomy. Furthermore, if we accept the moral claim that each individual is unique, while making decisions affecting such persons on the basis of limited information, we must also accept that there is a chance that any decision we make may be wrong. (It is clearly no solution to say that we must obtain all the information about the person, because then we could still not make a decision. We would not have time.) We have to accommodate the idea of making morally acceptable (good, rational, or fair) decisions under conditions of uncertainty. This presents some difficulty since it has been customary to

consider most issues of morals on the assumption that states can be accurately defined.

A RATIONAL DECISION

We have used terms to qualify decisions, such as "good," "fair," or "rational." The idea of "fairness" will be touched upon later. The idea of "rationality" is a difficult issue, but one which can be considered to be relevant to sentencing and, indeed, to all other court decisions. Rationality has been discussed by philosophers from many different viewpoints; a rational decision, however, may be somewhat easier to define than the idea of rationality.

Statistical decision theory offers one such simple definition. We must assume that there is available a choice of possible decisions. (Clearly if only one decision is possible it is not profitable to discuss whether it is or is not rational.) Normally, there will be a choice, since it is usually possible to decide or to decide not to decide; the latter being also a decision. A body of information is also assumed to exist. It is not meaningful to discuss the idea of rationality of a decision if the decision is made in the total absence of information. Again, however, this is a trivial condition, since in order to perceive the need to make a decision we would expect some information to be available. Third, there must be some criterion or purpose in respect of the decision to be selected. Usually, this is stated in the form of something which we wish to maximize or minimize. If we do not know what we wish to achieve, it is not possible to consider the rationality of any selection among possible decisions. Thus, *a rational decision is that decision among those possible for the decision-maker which, in the light of the information available, maximizes the probability of the achievement of the purpose of the decision-maker in that specific and particular case.*

It must be noted that each rational decision is considered as a specific and single route between the information and the goal. There are, of course, decisions about decisions. It may be rational for a decision-maker to decide-not-to-decide until he has more information. This may, or may not be, in itself, a rational decision. In order to determine whether this is so, we would need to have information about the information, since the second order decision is with regard to information and not to the initial criterion. It will be seen that this procedure can go on forever—fleas have smaller fleas which bite them. The fact that an infinite series is possible does not, however, render an absurdity the use of the concept of a rational decision in

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these terms. The ratio of the diameter to the circumference of a circle is also an infinite series, but we use (π) to the value which has sufficient accuracy for our purpose. It may be quite reasonable to ask questions (i.e., to seek information) about information which we are using in our decisions. Indeed, we might even claim that it is rational to do so. The method and the criterion, however, whereby we should assess information is not the same as the method or criterion we use in relation to the decision which concerned us in the first level of our consideration.

If this argument seems complex or unnecessary it may be noted that some recent research suggests that most decision-makers do, in fact, carry out a process of this kind. In coming to a conclusion by searching and weighing information, there is a transition from seeking information with respect to the decision itself to the seeking of information about the information used in arriving at the initial decision. An interim decision, say, to grant parole, will be made after the decision-maker has examined a small number of items of information. He does not stop seeking information at this point but continues to examine further data. It appears, however, that he is not relating the latter items of information to the decision criterion, but to the information upon which he based his initial (or interim) decision. If no item of information appears in the latter period of search which seems to fit badly with an item used in the interim decision, the decision is quite soon made final—the information search ceases. If on the other hand information at the later stages seems to be dissonant with some of the earlier information, the search will continue. It is far more satisfactory to see the latter search for information as relating to “information-about-information” (a checking for possible dissonance) rather than the obtaining and weighing of further data with respect to the decision itself.

ASSISTING THE DECISION-MAKER

The phenomenon described in the preceding paragraph has been made use of in a practical manner in relation to decisions of the United States (Federal) Board of Parole. The initial decision is simplified (or almost routinized) by the use of guidelines. The human decision-maker is relieved of much of the effort of making the first decision, but he is especially to be concerned with the second part of the decision process—to examine information which may suggest dissonance to the extent that, in any particular case, the guidelines should be set aside. The process of decision-making in this area can

then be improved by collecting together the reasons put forward for considering particular items of information dissonant with the guidelines and subjecting these to rigorous appraisal. The practical application of this theory has been found to be most useful to the Parole Board and has been commended in at least one court opinion (Gottfredson et al. 1973).

In re: Lupo v. Norton, and Zagarino v. Attorney General of the United States, et al. the court noted:

The issues arise because the Board, though not constitutionally required to give reasons for its decisions, *Memechino v. Oswald*, 430 F.2d 403 (2d Cir. 1970), has commendably adopted a new procedure designed to promote rationality in the decision-making process and to enhance understanding of the process by all concerned, especially prisoners. Key ingredients of the new procedure are (a) the use of a table of guidelines as an aid in deciding the appropriate length of time a prisoner should serve before being paroled, see 28, C.F.R. §2.52, and (b) a requirement that a prisoner denied parole receive in writing the reasons for the decision, see 28 C.F.R. §2.15 (c) (revised). These aspects of the new procedure are detailed in *Battle v. Norton*, 365 F. Supp. 925 (D. Conn. 1973), and *Grasso v. Norton* (D. Conn. 1974). The guideline table sets forth suggested lengths of time to be served prior to parole for various combinations of two variables, the severity of the offense and the characteristics of the offender.⁴

RATIONALITY, DIFFICULTY, AND CONFIDENCE

It may seem adequate, if we wish to know how difficult a decision is for a decision-maker, merely to ask him. Similarly, if we were to ask how confident a person felt about a decision once he had made it we might expect a useful answer. In practical situations these procedures lead to some rather peculiar results.

If we assume that the human decision-making processes are similar to those which might take place in a computer we would assume that the more difficult the task, the more work would have to be done to obtain the same level of confidence. Further, we might measure the amount of work in terms of the quantity of information examined—the more, the greater the amount of work done. We have

⁴It may be noted that the items in the variable termed here, "characteristics of the offender," consist mainly of his previous conviction record and related matters.

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noted earlier that the level of confidence which a decision-maker would require before terminating the information search process would be expected to be associated with the believed consequences of any decision he might make. A decision with trivial consequences would require a low level of confidence, and hence little work, and fewer items of information would be expected to be studied. If we hold constant the level of the seriousness of the decision (consequences) we would expect the level of confidence achieved to be inversely related to the assessed difficulty. That more confidence is obtained only by more work seems a reasonable assumption.

Actual experimental results prove otherwise. As expected, decision-makers, in a sequence of interim decisions, assess their level of confidence to be increasing as the amount of information they examine is increased. They also claim, however, that as the amount of work done increases (the number of items of information examined increases) the difficulty of the decision task *decreases!* The ease with which a decision is said to be made is directly proportional to the level of confidence in the decision. It is said to be the easy decision in which there is confidence, and, as the difficulty is seen to be increasing, the confidence diminishes. It may be that the individual decision-maker is unaware of the fact that as he examines more information he is doing more work. He believes that as he examines more information the task of making a decision is progressively becoming easier. If we were to simulate the human decision-making process by the use of a computer, the greater the level of confidence we required, the more work the computer would have to do; and we might say that this would be, for the computer, a more difficult task.

It will be noted that the relationship between confidence and difficulty in decision-making is only unexpected if we assume that decision-making is a process. If we assume that all decision-makers, when involved in the actual task of decision-making, realize, as we stated in the beginning of this chapter, decision-making is not a process, but the *termination of a process*, then the rating makes sense.

In rating confidence and difficulty, the decision-makers are not considering the processes of information search but of *terminating* the information search—that is, coming to a decision. It is obvious that if we view a decision in this way it is easier to stop the process when we are confident—a positive correlation is then expected between ease and confidence. If, however, we think of decision-making as a process, then this is a very striking anomalous result.

There is still one remaining disturbing finding from the experimental work from which the results noted in the previous paragraph were derived (Wilkins 1959). All decision-makers claim that they can

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deal with large quantities of information at least as easily as small quantities. The information search is continued well beyond the point at which research shows any possible utility to the continuing activity. This is a more serious error than a mere wasteful use of time and effort. Usually, it seems that persons will not voluntarily terminate the information search until they have reached the point of information overload and their expected performance has deteriorated to well below their optimal level. This is, of course, unfortunate, but not unexpected. In any continuing task how do we know that we are beginning to do badly? If we are playing any ball games, we know the exact level of our success after each stroke—there is continuous feedback. Our decision-maker, however, does not have any means for knowing, after each item has been retrieved and studied, how well he is doing in his attempts to combine the data into a rational decision. The only way in which the information searcher/decision-maker has any feedback that his performance is deteriorating is when he senses that he is beginning to be disorganized. This is an internal, subjective criterion which may function quite differently in different decision-makers. Most decision-makers are not satisfied to cease the information search in decisions regarding offenders until the number of items exceeds the memory span. The number of items of information which can be used in a decision (as Burnham in another place in this monograph has discussed) is a mere fraction of the number which can be remembered. In experiments with case data from files of offenders it appears that up to 30 items can be remembered immediately after the presentation of the information, where the recall is facilitated by a checklist in which one response is fixed as correct if the two others are also correct. This would seem to be providing almost the best conditions for recall. Individual decision-makers, however, will seldom stop their information search operations at less than 30 items, nor do there appear to be any stopping rules consciously applied. The process is terminated by a feeling that enough data has been obtained. This feeling appears to agree closely with a recognition that the information already studied is not being well organized for the purpose required. In other words, there has been some internal feedback indicating overloading or disorganization.

There are many and various research studies of decision-making and there is also a large body of theory. Much of this work is reviewed in the chapter by Burnham already mentioned. For the purpose of the present argument our position can be summarized quite simply. Decision-makers who believe that they can consider all the relevant information are deceiving themselves. Decision-makers who believe that they need only more information in order to make better

decisions are clearly incorrect. Computer salesmen who try to persuade managers, administrators, and judges that "if only they could have information at-their-fingertips their problems would be solved" have far too simplistic an idea of information search, retrieval, and decision-making.

Pending further research in cooperation with decision-makers in a variety of decision situations, there are few indications of how we might proceed toward improved decision-making. Clearly complex problems cannot be addressed without considerable quantities of information; yet, as we have indicated, the human information processing does not seem adequate. Complex problems must, perhaps, be broken down into dimensions or elements and then recombined after simple, less complex decisions have been made on limited sets of data. In this way the human decision-maker may not be overloaded with considerations outside the immediate concern of the particular dimension, and there is an opportunity to proceed to examine the issues one by one. However, such a process of breaking down requires a complementary method for putting together. Rules for recombination of the subproblems must also be identified. Perhaps an example of the reduction of a problem to dimensions may be given. Judicial decision-making is often concerned with the problem of the dangerous offender.

SENTENCING THE "DANGEROUS OFFENDER"

Who is the dangerous offender? What constitutes dangerousness? There clearly will be differences of opinion on these questions, but let it be assumed that there is also some general basis of agreement. For purposes of illustration let us consider that any person who has committed an act of physical violence against another person may be defined as a potentially dangerous offender. The initial act of violence may, under this formulation, be taken to be a superficial indicator of further violence. Of course nothing which can be done after the act can change the circumstances or nature of the act itself. We might wish to take the view that the only action justified with respect to the offender is that which takes account only of his *past* crime or crimes. If this view is taken, then clearly there is no point in collecting information which relates to the probable actions of the offender in the future. Most philosophies of sentencing would take a rather different view—probable future acts of violence are a consideration

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in the disposition as effected through the sentence, while the seriousness of the past act is also to be taken into account. It does not follow, however, that the more serious the past act the more probable a future act. Indeed the general trend seems to be in the reverse order. It will be clear that as soon as it is acknowledged that there are two considerations (or more) in determining the disposition, the question of balancing them also appears as a problem. What may be indicated as a reasonable disposition in terms of one consideration may be reinforced by the other or may be contraindicated by it. It is possible to continue to discuss issues of complexity far beyond this point in abstract terms. But the stating of the problems does not provide a formal solution; rather, there is a tendency to think that because the issues can be stated they can be dealt with by common sense or by application of general intelligence and experience without reference to any explicated rules of analysis or combination. It does not, then, assist with decision-making research to continue to note the complex issues, but rather to examine the consequences of simple ones in the first instance.

The first question raised when the example of the dangerous offender is posed is that of whether the past offense alone provides the basis for the disposition or whether some implicit prediction of future dangerousness was involved. This is a fundamental discrimination of the possible bases for information search strategies, decisions, and moral value choices. Immediately, when attention turns to considerations of probable future states or events (and there are important differences between these which we will not discuss), the consequences of any decision also change. The past is more surely known than the future, indeed insofar as we can know the future, it is only by inference from the past or the present. Thus, if we are concerned only with the award of just punishment (without concern for the future probability of crime) we would base our moral judgment as to what constituted "just desserts" in terms of the seriousness of the criminal act and that alone, whereas if we wish to make inferences with regard to future behavior, the limitation of information to the quality of the criminal act may afford no guide. The main difference, however, is not in terms of the nature and quality of the information to be sought, but rather in terms of the nature of the decision. In the former case the decision is a moral matter; in the latter it is more akin to, say, business, scientific, technical or even mathematical decisions since the focus is upon an estimate of a probability. Once the probability is determined, there is still remaining a moral question to be determined even if the moral questions regarding the nature of the initial offense are ignored.

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The technical issues raise further moral questions, because any inferences with regard to the future (e.g., probability estimates, whether intuitive or mathematical) can be incorrect in two quite different ways. Moreover, the two different kinds of error have different kinds of consequences and, hence, it would generally be accepted, two different kinds of moral issues to be balanced. A consideration of errors of prognosis will indicate the value of subdividing of problems—the dividing of errors into two kinds, known to statisticians (not surprisingly) as errors of the *first* and *second* kind!

a) Errors of *First* and *Second* kind.

A decision is wrong if we reject the hypothesis when it is in fact true and also wrong if we accept it when it is false. These two ways of being incorrect are not, however, necessarily equally wrong. That is, we may predict a particular case as being a likely recidivist and be either right or wrong, and may predict a case to be nonrecidivist and be either right or wrong. This is clear from the two-way table (table 1).

Table 1. Predicted and actual outcomes and kinds of errors

Predicted outcome	Actual outcome	
	Success	Failure
Success	(right)	(wrong)
Failure	(wrong)	(right)

It is customary to use the term “false positive” to designate those cases predicted incorrectly as becoming failures. That is, “false” applies to the direction of prediction. Alternatively, the risk of error can be seen as representing, as it often does in practice, either a consumer or a producer risk. In many situations in the criminal justice field, however, there is no opportunity for identification of the consumer risk. This is because when a prediction is made that the individual will recidivate (fail) if he is released, he will, in fact be detained in the institution; accordingly, he has no opportunity of demonstrating that the prediction was wrong—that he could succeed. When he is eventually released, if he is then successful, this fact is credited to the decision to hold him longer (i.e., for more treatment), and this was effective, thus proving the earlier decision to be correct! If on the other hand, he fails, this is direct proof that the earlier prediction was also right—he was thought to fail if released then, he was

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released later and failed, and clearly the failure could not be the result of further treatment. This is a kind of Catch 22 in reverse! No matter what the outcome is in relation to the prediction, three of the four results (as noted by the cells of table 1) are assumed to reaffirm the wisdom of whatever decision is made, so long as it resulted in the offender being detained longer. Only if the offender is released and then fails (top right-hand cell of table) must the predicted outcome be considered to be an incorrect prediction. There is, thus, a built-in bias toward risk averse behavior in assessing probable outcomes.

In addition to difficulties in assessing the errors in just terms because of the confounding of predictions with decisions, there are questions of trade-off between various preferences or moral values. Some of the issues are due to the fact that prediction of future outcomes (prognosis) is an inexact science. Perhaps the most detailed and extensive study of the violent offender, which was conducted in the attempt to find a measure of violence-proneness, was that of Wenk and Emrich (1972). They studied over 4,000 young men in California, giving them a very large variety of tests and collecting data on almost every aspect of their lives. They used the best known techniques of statistical analysis to build a prediction table for violence proneness. They were not very successful. They say,

Those individuals who have the top 260 scores (of the 4,000) were classified as violent-prone, and the remainder as not violent-prone. On the first step with variable one (history of violence), twenty-eight individuals were correctly classified as violent-prone as they were also found to be in the violent sub-sample (true positives). These hits stand against 256 individuals who were misclassified. According to the prediction index, 24 persons were classified as non-violent (false negatives); and 232 persons were classified by the index as violent-prone and turned out to be non-violent (false positives).

This means that in order to ensure that about half of the persons who are in fact violent are identified in advance, the penalty is that we would also classify 9 out of every 10 incorrectly. We cannot identify the 1 among the 10 who must be classified as potentially violent because all have similar characteristics. The implications for the two classes of error (consumer/offender v. producer/decision-maker risk) are very clear in this example, and the problem of the trade-off as a moral choice is most strongly evident. How many false positives (i.e., persons who are similarly suspect) is it reasonable to incarcerate in order that we can be sure to incarcerate the true positive cases? Is it reasonable or morally acceptable to treat as dangerous 100 persons of whom 10 may be correctly assigned to the "dangerous"

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category? It does not appear that it is possible to do better than to have nine false positive cases for every correct assignment if we are to catch half of those who will commit other violent offenses—that is the limit of present knowledge. If 50 persons wrongly considered as dangerous is too high a price to pay for the 50 percent insurance, then would 50 persons for 10 percent insurance be morally acceptable? If not 50 for 10, then what number represents a morally acceptable ratio between the true and the false positives? If we act at all and even if we do not, there will be some number representing this ratio. The only way to avoid treating any person incorrectly as a potentially violent offender is to treat no one at all as being potentially violent. Similarly, if we wish to incarcerate all potentially violent persons, we must incarcerate all persons, since everybody has some risk of committing a violent act!

The problem may be avoided if it is proposed that we act with respect to offenders only in terms of their past act, making no assessment with regard to future probable acts and not modifying the decision in terms of any expected behavior. This is the “just desserts” argument made by the recent book entitled *Struggle for Justice* (American Friends Service Committee 1971). If any consideration is not completely in terms of the past, then the issue of the trade-off between risks has to be faced.

It may be suggested that while an insurance against false positives should be quite high when this has regard to the normal citizen, the ratio might reasonably be reduced when persons who had already committed crimes or particularly violent crimes were concerned. This is not an unreasonable suggestion, but it sets further constraints and raises other issues which can be subdivided and considered (see table 2).

Table 2. Prior record and morally acceptable false positives

Classification of person	Level of false positives regarded as morally acceptable
(1) Nonoffender.....	(a) none acceptable.
(2) One prior, nonviolent, proved offense.....	(b) some slight reduction in the proportion of false positives (p).
(3) One prior, violent, proved offense.....	(c) value of (p) lower than that for 2(b).
(4) Two prior, nonviolent, proved offenses.....	(d) value of (p) lower than 2(b) and/or 3(c)?
(5) Two prior: one violent, one nonviolent.....	(e)
(6)	(f)

There is difficulty in establishing a hierarchy in the first column: Is (4) worse than (3) in all cases or only for some? Given that a hierarchy could be established for that column, there is still the issue of determining the intervals among the (p) values in the second column. Having established a hierarchy for the first column, however, it would follow that the second column should diminish in (p) values from the top entry downwards. Thus, we see that by spelling out in a specific form one set of issues, another set begins to show constraints on the values which may be accepted as rational or morally acceptable.

The analysis in the preceding paragraphs indicates what may be achieved by the process of attempting to provide models for the decision-making of judges, prosecutors, or others in the criminal justice field. At the present stage of development, the major contribution from decision theory may be in that attempting to apply it, new dimensions are forced into our thinking. Some useful models (as previously noted, see p. 71) are already being applied by the U.S. Board of Parole and much more could be done to build other models to harness the computer to assist the decision-maker. The moral issues must be clearly defined, however, even though there may not be agreement about details.

THE NEXT STEPS IN DECISION RESEARCH FOR THE COURTS

There can be no question of the judge's role being taken over by the computer! The computer could, however, take a load of the work from the judge (or other decision-maker) and free his capacities for the kinds of considerations which require human thought and assessment. Finding ways to use the computer to assist the decision-maker is not merely a matter of technology; indeed the technology seems simple. Rather, the major considerations lie in the interface between technical (or scientific) and moral (or humanitarian) principles. Moral problems need to be considered anew as they apply to contemporary society. There would seem to be a moral requirement that man should be as rational as he knows how to be; yet the field of criminal justice abounds with symbolic activity. It is indeed doubtful whether society is ready for a completely rational approach to problems of social control. Moral constraints apply to rational decisions, of course, but there is a need also to consider the relation between our moral values and the symbolic activity of criminal justice procedures.

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Perhaps our main problem is that we have not been honest in our language in discussing criminal justice procedures. We have tried to believe that our actions were rational when they were mainly symbolic and we have used the language of a medical analog and confused many significant issues of equity in the process. If we were to acknowledge the symbolic elements, we might begin to understand their import and discover that they were of considerable value. The design of rational decision models in relation to computer technology forces us to use a different language from that which has served in the past, and the ambiguities in our current language appear in our attempts to translate. Furthermore, since the translation involves the communication among persons of different backgrounds, the field upon which it is focused may be enriched and advanced. No one authority in the field of criminal justice can merely delegate responsibility for certain specific areas to another; all concerned must understand the basic principles. We must be prepared to face up to the most serious problems of our time which lie in the interfaces among fields of specialization: This "no-man's-land" must be surveyed and its dangers and potential values explored.

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