MODELS OF DIAGNOSTIC JUDGMENTS

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The diagnostic process may be divided into three stages: data collection, information integration, and feedback (Kahneman & Tversky, 1979). The present paper is concerned only with the second of these stages: the information integration stage. This is not because the other stages are unimportant, but because most of the research on human judgment has been aimed at this stage. One reason for this may be that it provides a particular challenge, for whereas the other two stages in the diagnostic process are overt and public, the information integration stage tends to be covert and private: the diagnostician often is not able to describe how he arrives at his judgments (e.g., Hoffman, 1960).

The challenge to research, then, is this: How do we describe a mental process of which the person himself is not aware? Fortunately, there is a simple solution to this problem. This solution takes as its point of departure that although a person may not be able to describe how he makes his judgments, he is nevertheless able to make them when he is given the relevant information. If we know what judgments a person has made, and the information upon which the judgments are based, it is possible to construct a model that relates the judgments to the input information. If our model is successful, it will produce the same judgment as the person does when given the same information. The model is then a simulation of the mental process, and we will be

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able to learn about this covert and private process by studying the overt and public simulation.

The problem, then, is to choose an appropriate model for this simulation. Psychologists studying human judgment processes have found that linear statistical models, such as multiple regression, are useful in this context. This is not the place to discuss the reasons for this particular kind of models; I have done so at length elsewhere (Brehmer, 1979). It is sufficient to point out two important features of these models. First, they can be used for describing systems that contain uncertainty. Thus, they can be used, not only to describe the mental process involved in diagnosis but also the diagnostic tasks. That is, the same model can be used to describe both the person and the task, and this enables us to compare them. This is important, because it makes it possible to determine the extent to which the person uses the information available for his judgments in an adequate way. This reveals how well the person performs, and will suggest how he would have to change to improve.

A second advantage of linear models is that they describe the process in terms that are readily understood by the person being analysed. This is, of course, a necessary condition if we want the person to use the information to change his mental system to improve his judgments.

Linear models have now been used to analyse diagnostic judgments in a wide variety of circumstances. The subjects studied include stock brokers, clinical psychologists and physicians (see, e.g., Slovic & Lichtenstein, 1971 for a review). In an as yet published series of studies, we have used linear models to study a variety of judgments by psychiatrists, psychologists and nurses.

These studies are carried out in a series of standardized steps. The aim of the first step is to set up the judgment task. In this step, the subjects for the study are interviewed to ascertain what information they require for making the judgments under investigation. For example, if the purpose of the study is to investigate how the psychiatrists make judgments about the risk that a patient will commit suicide, each psychiatrist will first be asked what things he or she will need to know about the patient to decide whether or not the patient will commit suicide. These interviews will yield a list of symptoms, most of which are usually common to all of the subjects, although some, of course, may be idiosyncratic. In the second step, a subset of the symptoms on the list are selected. If the purpose of the study is to analyze the group of subjects, this list may comprise those that are common to all of the subjects. It is, however, also possible to work with each individual subject's list of symptoms, doing all