

## Modeling Patient Decision-Making: The Role of Base-Rate and Anecdotal Information

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Guidelines for managing patient–physician relationships often stem from either paternalistic or shared decision-making perspectives. Despite a number of advantages shown for the shared decision-making model, questions remain as to whether lay people make the most optimal decisions about their health care. This study explored the influence of anecdotal and base-rate information on health-care decisions. Three hundred and seventeen undergraduates read two vignettes describing a fictitious disease, followed by a description of two potential treatment protocols. The comparison treatment was 50% effective and accompanied by an anecdote that described a patient whose treatment resulted in an ambiguous outcome. A second treatment was presented as 30, 50, 70, or 90% effective, and accompanied by an anecdote that described a patient whose treatment resulted in a positive, ambiguous, or negative outcome. Subjects weighted anecdotal information more heavily than base-rate, or statistical, information when the anecdotal information was clearly positive or negative. Subjects presented with ambiguous anecdotal information weighed base-rate information most heavily. Implications for enhancing patient decision-making are discussed.

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**KEY WORDS:** patient decision-making; medical decision-making; clinical decision-making; anecdote; base-rate.

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### INTRODUCTION

There are several models for managing patient–physician relationships. The most traditional is the paternalistic model, which is characterized by limited patient involvement in medical decision-making. In this model, the physician takes on the role of diagnosing a condition and selecting treatment options. The basic assumption is that physicians and patients share a common goal and that physicians alone have the information and experience needed to make a competent decision (Deber, 1994). With the development of information technologies, patients have in-

creased access to information regarding the diagnosis and treatment of most medical conditions. Patients are now able to use this information to confirm diagnoses, obtain second opinions, contact support groups, and aid in their medical decision-making. This implies that patient–physician relationships are changing with more patients taking an active role in making medical decisions.

Legal mandates have also contributed to the changing nature of patient–physician relationships. Informed consent laws mandate that patients consent to treatment before any treatment can be implemented. As a result, decision-making is shared at least at a minimal level as patients understand and agree to treatment.

In contrast to the paternalistic model, the shared model of patient–physician interaction is characterized by a two-way decision-making process. The shared model has been proposed as the ideal model for medical decision-making, with physicians and patients working together to craft optimal decisions

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(Deber, 1994). There are significant advantages to the shared decision-making model. For example, individuals who participate in decisions about their own medical treatment have been found to have less morbidity than those who do not participate (Greenfield, Kaplan, & Ware, 1985; Lerman et al., 1990; Mahler & Kulik, 1990). Increased involvement of patients in medical decision-making has also been found to increase satisfaction with medical treatment in cases where there is more than one alternative treatment recommendation (Moyer & Solovey, 1998). Finally, shared decision-making has been found to be related to increased adherence to treatment (Speedling & Rose, 1985).

Despite the fact that patient–physician interactions following the shared decision-making model have been found to have a positive impact, the questions remains: Can patients make accurate and effective decisions regarding their health care? What are the obstacles?

Some research suggests that even with adequate information, eliciting reasonable, informed and unbiased decisions from patients can be a difficult task (Redelmeier, Rozin, & Kahneman, 1993). There are a number of errors that individuals make when faced with decisions in general. These include the anchoring heuristic, biased search strategies, and the availability heuristic. In a review of the medical decision-making literature, Redelmeier et al. (1993) outlined several decision-making errors that patients often make when faced with a medical problem. These errors can be conceptualized into three broad categories: (1) over reliance on past experiences, (2) emotional override, and (3) not comprehending statistical information.

In a classic article (Kahneman & Tversky, 1973), Kahneman and Tversky provided participants with a personality description of an individual whose personality was similar to a stereotypical depiction of either a lawyer or an engineer. Participants were told the base-rate of lawyers to engineers was 7 to 3. Participants subsequently guessed the occupation that went with each personality description. Base-rate information had no discernable impact. That is, personality descriptions that matched the stereotype of a lawyer were attributed to a lawyer and personality descriptions that matched the stereotype of an engineer were attributed to an engineer. The authors commented that people lack the cognitive ability to deal with base-rate information. That is, subjects did not understand the robustness of statistics based on large samples and relied on individual portrayals. This blindness to

sample size has also been coined the “belief in the law of small numbers” (Tversky & Kahneman, 1971).

The authors are unaware of previous studies that have used an analogue design to explore what information people pay attention to when making medical decisions. The current study aimed to do just this. More specifically, this study asked: How do college students weight anecdotal versus base-rate, or statistical, information when making judgments in the context of medical decision-making? The ultimate goal was to generate hypotheses regarding how physicians might structure information to enhance patient decision-making.

## METHODS

### Participants

Three hundred and seventeen students from undergraduate psychology courses at a medium size Midwestern University participated in this study. All participants read and signed the Internal Review Board approved informed consent document prior to their participation. Ages ranged from 18 to 25 ( $M = 19$ ;  $SD = 1.45$ ). Seventy-six percent ( $n = 241$ ) of the participants were female. Fifty-three percent ( $n = 168$ ) were freshmen, 24% ( $n = 76$ ) were sophomores, 15% ( $n = 48$ ) were juniors, and 8% ( $n = 25$ ) were seniors. Of the 312 subjects who reported their race, 89% were Caucasian.

### Materials

#### *Vignettes*

A series of vignettes assessed decision-making. The vignettes described a fictitious disease, Schistomanliasis (SCIMAS). A fictitious disease was used to eliminate the possibility of familiarity with the information about the disease. The name, Schistomanliasis, was derived from a combination of diseases endemic to Africa and the parasites that cause them. Symptoms associated with Creutzfeld–Jacob’s Disease were used to develop fictitious disease related symptoms. More specifically, SCIMAS was described as a disease that causes significant muscular and cognitive difficulties that, if left untreated, eventually lead to death. SCIMAS infection reportedly stemmed from exposure to the microscopic eggs of a parasitic flatworm. It was presented as affecting men and women of all ages and racial groups. To further increase the relevance, the