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Is Hindsight a Fair Judge of Foresight?: An Experimental Investigation of Second-Guessing

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IS HINDSIGHT A FAIR JUDGE OF FORESIGHT?:
AN EXPERIMENTAL INVESTIGATION OF SECOND-GUESSING

by

LAURIE ANDERSON

A Dissertation Submitted to the Faculty of the Graduate
School of Loyola University of Chicago in Partial
Fulfillment of the Requirements for the Degree of
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VITA

The author, Laurie Anderson, is the daughter of David F. Anderson and Jane Shanahan Anderson. She was born on October 22, 1955 in Manchester, New Hampshire.

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CHAPTER I

INTRODUCTION

The Problem

In an era of increased public scrutiny and accountability, hindsightful evaluations of others' decisions are frequently required. This study was designed to investigate the very assumption that underlies the fair evaluation of others' decisions, namely, that people can perceive how a situation was experienced rather than how it should have been experienced given the illumination of hindsight.

The fairness or objectivity of second-guessing is a crucial issue for professionals or experts called upon to make decisions that affect other people. Some of the professionals more frequently and publically challenged include political leaders, economists, educators, physicians, psychologists, police officers, and baseball managers. When second-guessed by hindsightful observers, "mistakes" for members of these and other groups can be interpreted as incompetence, negligence, or worse.

The objectivity of second-guessing is also a crucial issue for those who are called upon to objectively assess the judgment of others. Our legal strategy for evaluating people's judgment relies almost exclusively on the hindsight of some to judge the foresight of others. Yet it may be that cognitive biases associated with hindsight preclude the required objectivity. Thus, the very system we designed to enhance objectivity may actually minimize that objectivity and consequently, the justice that is served.

The Fallibility of Predictive Judgment

Much of the early research on predictive judgment was marked by a distinctive rationalistic bias. It was assumed that people relied on mathematically optimal strategies for all their judgment needs. According to this view, errors in judgment resulted from one of two things. Either there were accidental errors due to problems with the information or there was cognitive interference from some irrational motives or needs (Fischhoff, 1976; Hammond, McClelland, & Mumpower, 1980; Taylor, 1982).

Meehl's (1954) classic monograph first reviewed evidence to show that linear combinations of information outperform the intuitive judgments of clinicians in behavioral prediction. Meehl's observations were controversial, attracting much interest in the study of predictive judgment in a variety of contexts (Wiggins, 1973). None of the subsequent studies that focused on clinical and statistical prediction were able to demonstrate clinical superiority (Dawes, 1976; Goldberg, 1968; Gough, 1962; Sawyer, 1966). Moreover, later studies of predictive judgment were able to document a disconcerting lack of judgmental accuracy across task and situational factors with a variety of subject populations (e.g., Einhorn & Hogarth, 1981; Lichtenstein & Fischhoff, 1977; Slovic, Fischhoff, & Lichtenstein, 1977; Szucko & Kleinmuntz, 1981). Perhaps even more disturbing were the additional findings that people, experts and non-experts alike, maintained great confidence in their fallible judgment (e.g., Einhorn & Hogarth, 1978; Fischhoff, Slovic, & Lichtenstein, 1977; Kahneman & Tversky, 1973, 1982; Lichtenstein & Fischhoff, 1977; Oskamp, 1982).

Because of the rapidly diminishing empirical support for the rationalistic approach to the study of judgment, a major shift occurred in the literature towards the study of predictable departures from optimality (Abelson & Levi, 1985; Hammond et al., 1980; Markus & Zajonc, 1985). Kahneman and Tversky (1973,1982; Tversky & Kahneman, 1971,1982a,1982b,1983) traced some of the predictable errors in judgment to the use of heuristics or simplification strategies. For instance, they found that the "availability" of information influenced judgment. Specifically, if people could think of several instances of one kind of event as compared to another, they were inclined to think that the former event occurs more frequently than the latter. Sometimes the use of heuristics is valid. For example, it is often true that instances of more frequent events, such as losing baseball seasons in Chicago, are recalled more easily than instances of less frequent events, (i.e., winning seasons). Other times, however, it can lead to systematic biases. For instance, the use of the availability heuristic has been associated with the overestimation of well-publicized events, such as deaths due to homicide or cancer, and the underestimation of less well-publicized events, such as deaths due to asthma and diabetes (Lichtenstein, Slovic, Fischhoff, Layman, & Combs, 1978).

The work of Kahneman and Tversky inspired a wealth of research on systematic biases in predictive judgment. This work documented a series of biases associated specifically with the estimation of outcome probabilities. For instance, when estimating outcomes, people have been found to disregard base-rate information (Bar-Hillel, 1973; Nisbett & Borgida, 1975; Tversky & Kahneman, 1982a), to be generally oblivious to

questions of sample size (Tversky & Kahneman, 1971, 1974), to overweigh positive occurrences of an event more than non-occurrences (Einhorn & Hogarth, 1978; Estes, 1976), to seek and retain information that confirms an impression and to disregard or forget information that is disconfirmatory (Beyth & Fischhoff, 1977; Cohen, 1981; Einhorn & Hogarth, 1978; Mynatt, Doherty, & Tweeney, 1977; Snyder, Campbell, & Preston, 1982; Snyder & Cantor, 1979; Snyder & Swann, 1978), and to overestimate the probability of related events occurring together (Bar-Hillel, 1973; Einhorn & Hogarth, 1978; Fischhoff, Slovic, & Lichtenstein, 1977; Tversky & Kahneman, 1982b).

Hindsight Bias

The Phenomenon

One bias that this work identified, which has both theoretical and practical significance, has been labeled hindsight bias, creeping determinism, or the knew-it-all-along effect (Fischhoff, 1975a, 1975b, 1977). Hindsight bias, as it will be called here, refers to certain judgmental distortions that result once people have been informed of the outcome to a situation. First, the particular outcome seems, with hindsight, to be inevitable. Second, people not only tend to view the outcome as inevitable, but also view it as having appeared "relatively inevitable" before it happened. That is, they see direct relationships between certain preceding events and what eventuated. Third, people underestimate the effect that outcome information has on their predictions. They misremember their own foresightful predictions so as to exaggerate in hindsight what they actually reported knowing in foresight. Finally, people

wrongly estimate that those without benefit of hindsight have the same predictive capabilities as those with hindsight. (Fischhoff, 1975a, 1975b, 1977; Fischhoff & Beyth-Marom, 1975; Wood, 1978). Moreover, the distortions associated with hindsight bias have been found to be strongest for events initially judged to be the least plausible (Arkes, Wortman, Saville, & Harkness, 1981; Fischhoff, 1977; Wood, 1978).

Fischhoff (1975a, 1975b), who pioneered this line of inquiry, first demonstrated the effect of outcome information on individual predictions. In a prototypical experiment, all subjects were first given a passage to read. Subjects had been randomly assigned to conditions with various outcome information included at the end of the passage. Control subjects received no outcome information. After reading the material, all subjects were asked to make probability judgments about the likelihood of certain outcomes occurring "as if they did not know what happened." Hindsight bias was evidenced when the probabilities assigned to an outcome were higher among those who read of that particular outcome than among those who had no knowledge of that outcome occurring.

For example, in one experiment, Fischhoff (1975a) had subjects read an unfamiliar historical passage describing the beginning of a struggle between the British colonials and the Gurkhas of Nepal in 1814. The passage told of some minor defeats suffered by the British but excluded any information about the ultimate victor. Subjects were then asked to make probabilistic predictions concerning several mutually exclusive outcomes including British victory, Gurkha victory, military stalemate with no peace settlement, and military stalemate with a peace

settlement. Subjects were also asked to indicate which statements in the passage were particularly relevant to their predictions. Hindsight bias was apparent when subjects who were told of a Gurkha victory, for instance, perceived it as more likely than those who were given either no outcome information or different outcome information.

In the same study, relevance attributed to any datum was found to be highly dependent on which outcome subjects believed to have occurred. If the item was supportive of the outcome's occurrence, then it was more likely to be considered relevant. For example, the item "the British officers learned caution only after sharp reverses" was considered the most relevant statement by subjects informed of a British victory; this statement was considered comparatively irrelevant by subjects who read of other outcomes and by subjects who received no outcome information.

In another early study of hindsight bias, subjects were asked to make probabilistic predictions concerning current events rather than historic scenarios (Fischhoff & Beyth, 1975). Immediately before former President Nixon's 1972 trip to China and the USSR, subjects were asked to predict 15 possible outcomes, including, for example, the chances that the USA would establish a permanent diplomatic mission in Peking or that the USA and USSR would agree to a joint space program. Some time after the actual Nixon visit, subjects were unexpectedly asked to recall their predictions. Results showed that subjects recalled probabilistic predictions that were higher than their original predictions for the events they believed had actually occurred and lower for those that they believed had not occurred. (Subjects were not always accurate in their recollections of the events that had actually occurred.) In other

words, subjects recalled being much more clairvoyant than was actually the case.

Explanations of Hindsight Bias

The early studies of hindsight bias demonstrated clearly that outcome information biased predictive judgment and that people were largely unaware of falling prey to the bias. Were these findings indicative of a cognitive bias or were there motivational, artifactual, or situational reasons for the predictive distortions? Results from subsequent research pointed convincingly to a cognitive interpretation of hindsight bias with little or no support for alternative explanations. For instance, a series of motivational interpretations were consistently not supported by experimental results. Fischhoff (1977) examined whether hindsight bias represented the result of people having, but not applying, the appropriate cognitive talent. Specifically, he tried to eliminate hindsight bias by exhorting subjects to work harder. Before beginning their task, subjects were told: "Your responses are extremely important to us. The effort you invest in them will largely determine the value of our subsequent study. Please devote as much attention to this task as you can. Thank you." This manipulation was unsuccessful in reducing the predictive distortions resulting from outcome information.

In a more direct attempt to counter any motivational influences, Fischhoff (1977) explicitly warned subjects about the hindsight bias tendency. The specific instructions read:

On previous occasions in which we have given people this task, we have found that they exaggerate how much they have known without being told the answer. You might call this an I-knew-it-all-along effect.

Consider, for example, the following question. Adaptive radiation refers to (a) evolutionary changes in animal life toward increased specialization or (b) the movement of animals to a more suitable environment for survival. A group of people who were told that the correct answer was (a) believed that they would have assigned a probability of .60 to (a). A group of people who were not told the answer believed that the item was a toss-up. They assigned a probability of .50 to (a). Another group of people who were told that the correct answer was (a) believed that they would have assigned a probability of .40 to (b), the incorrect answer. Again, people who were not told the answer assigned a probability of .50 to (b). As you can see, people who were told the answer to an item assigned a higher probability to the correct answer or a lower probability to the incorrect answer than they might have if they had not been told the answer.

In completing the questionnaire, please do everything you can to avoid this bias. One reason why it happens is that people who are told the correct answer find it hard to imagine how they ever could have believed in the incorrect one. In answering, make certain that you haven't forgotten any reasons that you might have thought of in favor of the wrong answer - had you not been told that it was wrong. In addition to figuring out how the correct answer fits in with whatever else you know about each topic, devote some attention to trying to see how the incorrect answer might have fit in.

At the other extreme, however, be careful not to overcorrect and sell yourself short by underestimating how much you would have known without the answer. (pp. 354-355)

After reading this warning, subjects were just as likely as other hindsightful observers who did not read the warning to overestimate their predictive capabilities.

Still other motivationally-based explanations of hindsight bias have been explored, such as the hypothesis that subjects retrospectively claim better predictive capabilities to enhance their self-esteem or the hypothesis that people distort their public predictions as a self-presentation strategy (Leary, 1981,1982). Neither hypothesis was supported. While Leary found clear evidence of hindsight distortion, he found no evidence of any apparent mediating effects of self-esteem or self-presentation factors.

Experimental conditions have also been designed to test the relationship between other self-presentation factors and hindsight bias. For example, experimental tasks have been presented as memory exercises rather than tests of general knowledge (Fischhoff, 1977; Fischhoff & Beyth, 1975; Wood, 1978), assuming that subjects would feel less self-conscious about a poor memory than poor judgment. Subjects have also been asked to answer as foresightful peers would answer, on the assumption that there would be no particular motivation to overstate what their peers would know (Fischhoff, 1975a; Wood, 1978). Neither manipulation reduced the hindsight effect.

Along with these attempts to detect motivational sources of hindsight bias, the possibility that the hindsight phenomenon resulted from certain demand characteristic effects was also explored. For instance, Wood (1978) designed a series of experiments to assess a demand-characteristic interpretation of the effect. Subjects, whether students or surgeons, may consciously choose to use outcome information in an effort to please the experimenter. The "right" answer in prediction tasks may simply be too hard to ignore. Although it may be impossible to eliminate all demand-characteristic effects, Wood attempted to minimize their influence by specifically encouraging subjects to recall their foresightful predictions rather than reporting what seemed most likely from the outcome. Despite this instruction, Wood found clear evidence of hindsight bias.

Although neither motivational nor presentational interpretations have been supported, there is the possibility that various experimental artifacts might be contributing to the predictive distortions associated

with outcome information. To investigate this possibility, there were a series of studies varying certain task or situational factors. None of these efforts eliminated or reduced the bias. For instance, variations in experimental context have not eliminated the effect. Hindsight bias has been demonstrated with diverse experimental materials including historical events (Fischhoff, 1975a), psychotherapy case histories (Fischhoff, 1975a), facts of general knowledge (Wood, 1978), outcomes of scientific experiments (Slovic & Fischhoff, 1977) medical diagnoses (Arkes et al., 1981), and employment-related incidents (Mitchell & Kalb, 1981)

Variations in certain task factors have also failed to undo the bias. Fischhoff (1982b) described the following range of failed attempts to manipulate task factors and thus reduce hindsight bias:

substituting rating-scale judgments of "surprisingness" for probability assessments (Slovic & Fischhoff, 1977); using more homogeneous items to allow fuller evocation of one set of knowledge, rather than using general-knowledge questions scattered over a variety of content areas, none of which might be thought about very deeply (Fischhoff & Beyth, 1975); ... trying to dispel doubts about the nature of the experiment (Wood, 1978); using contemporary events that judges have considered in foresight prior to making their hindsight judgments (Fischhoff & Beyth, 1975);... separating subjects in time from the report of the event, in hopes of reducing its tendency to dominate their perceptual field (Fischhoff & Beyth, 1975; Wood, 1978);... having subjects assess the likelihood of the reported event's recurring rather than the likelihood of its happening in the first place, in the hope that uncertainty would be more available in the forward-looking perspective (Mitchell & Kalb, 1981; Slovic & Fischhoff, 1977). (pp. 428-429)

Hindsight bias has appeared across still more diverse experimental parameters, including conditions that contrast whether hindsight subjects perform hypothetical or straightforward judgments and whether the antecedent events are presented in greater or lesser detail (Slovic & Fischhoff, 1977). Hindsight bias also withstood variations in instruc-

tional sets, conditions with and without preoutcome judgments, and conditions with different statement sets (Wood, 1978).

Given the numerous failed attempts to minimize hindsight bias, other research efforts were directed at learning more about the cognitive factors associated with the bias. For example, although experts have been found to be susceptible to cognitive biases in judgment (Casscells, Schoenberger, & Graboys, 1978; Chapman & Chapman, 1982; Detmer et al., 1978; Eddy, 1982; Oskamp, 1982), it was thought that hindsight bias might be minimized, if not reduced, by expertise or intense involvement with a topic. For instance Arkes et al. (1981) predicted that subjects making predictions from a more established knowledge base would be less susceptible to hindsight bias than those asked to make predictions from positions of relative ignorance. However, studies that used experimental materials derived from subjects' particular experience or expertise do not reveal any expert immunity. Researchers have uncovered hindsight bias with surgeons evaluating an episode involving a possible leaking abdominal aortic aneurism (Detmer, Fryback, & Gassner, 1978), with physicians judging clinical assessments of a bartender with acute knee pain (Arkes et al., 1981), and with nurses evaluating outcomes related to subordinates' work performance (Mitchell & Kalb, 1981).

The possibility was also raised that cognitive limitations of foresight were confounding the hindsight- foresight differential. As explained by Slovic and Fischhoff (1977), it may be that the hindsight bias reflects foresight subjects' inability to see how things will look in the future as well as hindsight subjects' inability to recapture the uncertainties of the past. However, experiments designed to improve the

performance of the foresight subjects failed to reduce the difference between foresight and hindsight subjects (Slovic & Fischhoff, 1977).

Given the robustness of the hindsight effect, Fischhoff (1977) proposed that our vulnerability to hindsight bias results from an automatic assimilation of new and old information. That is, he argued that we tend to make sense of outcome information by immediately integrating it into what we already know about the given subject. Having made this reinterpretation, the reported outcome now seems an inevitable outgrowth of the reinterpreted situation. Even when trying to reconstruct our foresightful state of mind, we remain "anchored" in our hindsightful perspective, resulting in the reported outcome appearing more probable than before. Further, we may be so anchored in our present perspective that the previous cognitive state is beyond retrieval. Once we know what has happened and have adjusted our perceptions accordingly, we may find it difficult at best to imagine how things could have turned out otherwise.

This interpretation is consistent with research on cognitive processes in memory that found that our memory of the past was not a memory of the uncertainties of the past. Rather, it appeared as a reconstruction of past events in terms of what occurred or what we are told or remember to have occurred. Evidence for the reconstructive processes of memory were reported in prose recall (Pichert & Anderson, 1977; Anderson & Pichert, 1978; Spiro, 1980), as well as in the context of eyewitness testimony (Loftus, 1975, 1979, 1980; Loftus & Loftus, 1980).

Extending his original proposition, Fischhoff (1977) suggested that hindsight bias might represent a specific instance of a more gen-

eral inability to disregard information that has already been processed. This more general phenomenon has been documented with a variety of information, including inadmissible evidence in court (Sue, Smith, & Caldwell, 1973), tests of general knowledge (Fischhoff, 1977), experimental debriefing instructions (Ross, Lepper, & Hubbard, 1975), person descriptions (Wyer & Unverzagt, 1985), and scenarios of aggression followed by information of mitigating circumstances (Zillman & Cantor, 1976). Yet, this latter proposition has not been supported by other research on judgment and memory. For example, Ross et al. (1975) reported that "process debriefing" was generally successful in correcting biased predictions. Their manipulation provided explicit discussion of the perseverance dynamic, which is defined as the tendency to retain beliefs even after the original supporting evidence was discredited. In a study of memory, Hasher and Griffin (1978) found that subjects' recall also depended on certain experimental factors. Depending on the demands made on the subjects when retention was tested, subjects were able to disregard prior information.

More insight into the cognitive dynamics of hindsight bias was gained when researchers at last discovered a way to reduce the predictive distortions associated with outcome information. Specifically, the one strategy that has been effective at reducing hindsight bias required subjects to provide rationales for alternative outcomes. Slovic and Fischhoff (1977) proposed that outcome information may eliminate the need to consider alternative scenarios. In this sense, it functions as a heuristic or simplification strategy. Thus, if subjects are asked to consider the possibility of other outcomes, they may become less

"anchored" in the hindsightful perspective. When asked to play devil's advocate, that is to argue for the occurrence of outcomes that did not occur, the perceived inevitability of the reported outcome was in fact diminished (Koriat, Lichtenstein, & Fischhoff, 1980; Slovic & Fischhoff, 1977).

Playing devil's advocate, or the consider-the-opposite strategy (Lord, Lepper, & Preston, 1984), has proven successful in other attempts to overcome judgmental bias. For instance, the phenomenon of belief perseverance, defined as the tendency to retain beliefs even after the original supporting evidence has been invalidated (Ross et al., 1975), has been tempered by requiring subjects to provide causal explanations for alternative positions (Anderson, 1982; Anderson, Lepper, & Ross, 1980; Ross, et al., 1975). Lord, Lepper and Preston (1984) applied the strategy successfully to the biased assimilation of new evidence, defined as the tendency to interpret evidence in a way that supports initial beliefs (Lord, Ross, & Lepper, 1979), and to a related phenomenon, biased hypothesis-testing (Snyder & Swann, 1978). As with hindsight bias, the consider-the-opposite strategy was effective at "correcting" judgment in both these domains whereas explicit instructions to be fair and unbiased failed.

The success of the explanation task at reducing the bias suggests that it is not the outcome information per se that produces changes in likelihood estimates. Rather, it is the explanatory framework that subjects develop in hindsight that produces a sense of outcome inevitability (Ross et al., 1975; Ross, Lepper, Strack, & Steinmetz, 1977). Even after an outcome or belief has been discredited, subjects may retain a

salient cognitive schema that still supports the initial conclusion. Only when subjects are specifically asked to generate alternative rationales do they relinquish their cognitive attachment to the original perspective. Support for this view can be found in a series of experiments specifically designed to relate the influence of causal schemas to probabilistic predictions. Ross, Lepper, Strack, and Steinmetz (1977) found that providing an explanation for a clinical outcome increased its perceived likelihood. This was true even when subjects were told that the outcomes were hypothetical. Ross et al. concluded: "Having generated a plausible account for suggesting how a particular event might have been predicted from knowledge of a patient's prior history, subjects appeared consistently willing to make the inferential leap from possibility to probability" (p. 826).

Thus, the process of explaining an outcome's occurrence may represent the critical cognitive activity that produces biased predictive judgment. Other researchers have acknowledged the relationship between hindsight and causal schemas. For example, Hogarth (1980) noted that hindsight invites us to impose a causal structure on a sequence of events. With the outcome as a starting point, one can believe any causal sequence that seems plausible. In contrast, Hogarth noted that foresight requires "considerable powers of imagination and both the ability and willingness to entertain several hypotheses simultaneously" (p.102). Thus, hindsight bias might be the unfortunate result of "thinking backward" (Fischhoff, 1975b).

A possible link between hindsight and the tendency to "think backward" was suggested by the results of a famous experiment designed

to examine the clinical insights of mental health workers. David Rosenhan (1973) and colleagues each gained admission to a mental hospital by complaining of audible hallucinations. Once admitted, the researchers told the staff only the truth about their life histories and emotional states. However, each was diagnosed as schizophrenic and later discharged with the diagnosis "schizophrenia in remission." Rosenhan reported one example of how information was distorted by a staff member in order to achieve consistency with the diagnosis of schizophrenia. Specifically, one of the study confederates had revealed that he:

had a close relationship with his mother but was rather remote from his father during his early childhood. During adolescence and beyond, however, his father became a close friend, while his relationship with his mother cooled. His present relationship with his wife was characteristically close and warm. Apart from occasional angry exchanges, friction was minimal. The children had rarely been spanked. (p.253)

The clinical interpretation that was formally documented read:

This white 39-year-old male...manifests a long history of considerable ambivalence in close relationships, which begins in early childhood. A warm relationship with his mother cools during adolescence. A distant relationship to his father is described as becoming very intense. Affective stability is absent. His attempts to control emotionality with his wife and children are punctuated by angry outbursts and, in the case of the children, spankings. And while he says that he has several good friends, one senses considerable ambivalence embedded in those relationships also. (p.253)

People's attraction to explanations or causal schemas has been extensively documented from several perspectives. For instance, its existence is well documented in judgment and memory tasks (Ajzen, 1977; Anderson, Lepper, & Ross, 1980; Fiedler, 1982; Fiske & Linville, 1980; Hastie, 1981; Markus & Zajonc, 1985; Ross, Lepper, Strack, & Steinmetz, 1977; Taylor & Crocker, 1981; Wyer & Gordon, 1982). The relationship

between causal reasoning and predictive judgment has also been the subject of much of the attribution research (Ross, 1977; Ross & Anderson, 1982; Ross & Fletcher, 1985). In a review of the research on causal reasoning, Tversky and Kahneman (1982c) noted that earlier research has provided a "compelling demonstration of the irresistible tendency to perceive sequences of events in terms of causal relations, even when the perceiver is fully aware that the relationship between events is incidental and that the imputed causality is illusory" (p. 117). Further, they concluded that it is now "a psychological commonplace that people strive to achieve a coherent interpretation of the events that surround them, and that the organization of events by schemas of cause-effect relations serves to achieve this goal" (p. 117). Other research on judgment under uncertainty has further illustrated our cognitive drive for order even to the extent that people have been found to seek order and meaning in random events such as flipping a fair coin (Lindman & Edwards, 1961).

From an in-depth analysis of one possible manifestation of the drive for cognitive order, specifically, hindsight bias, we know that outcome information biases our predictive judgment, that we are largely unaware of being outcome-dependent, and that we are unable to transcend the bias except when specifically requested to generate rationales for alternative outcomes. However, we know very little about some of the practical implications associated with hindsight bias. A critical real-world implication of hindsight bias pertains to hindsightful evaluations, a phenomenon more commonly called second-guessing. Given what research has already uncovered, there is good reason to suspect the use

of hindsight as a valid or cognitively uncontaminated gauge of foresight.

Implications for Second-Guessing

In his early studies of hindsight bias, Fischhoff (1975a,1975b) acknowledged the implications that hindsight bias held for the objectivity of second-guessing.

Misfortunes bring out the Monday-morning quarterback in us all. When things go badly, we tend to look for a culprit to blame; then, once we find one, we second-guess him, wondering how he could have been so foolish. Looking back, we feel imbued with that special wisdom born of hindsight.

Historical examples abound, Pearl Harbor, the Bay of Pigs, Vietnam, Watergate - all of these once-future events seem now to be the inevitable result of stupid mistakes in judgment. Many of us feel that had we been in a position to influence matters, we would have made decisions more sagaciously than did those in power. But would we? (p.71)

Because of our second-guessing tendencies, which may be particularly aroused following an unfortunate event, Fischhoff (1975a) tested whether subjects, who were informed of the outcome to an event, could reconstruct the perceptions of people who did not have access to outcome information. In the experiment, both hindsight subjects, who were told that a particular outcome had occurred, and control subjects, who were given no outcome information, were instructed to "guess" the judgments of students of social science in other universities regarding the likelihood of certain outcomes and the significance of certain antecedent events. Fischhoff found that the hindsight subjects attributed more clairvoyant predictions to students in other universities than did control subjects. Further, hindsight subjects were more likely than control subjects to expect other students to recognize the significance of cer-

tain antecedent events that only the benefit of hindsight allowed them to see.

Thus, there is some evidence that the difficulty we have in recreating a foresightful perspective for ourselves is paralleled by what Fischhoff (1975a) called "a failure to empathize with outcome-ignorant others" (p. 295). However, there are three important questions to address before the connection between outcome information and biased second-guessing can be confidently drawn. First, the fairness of second-guessing is predicated on the notion that we can see how a situation appeared to others, that is, before the outcome was known. In order to generalize hindsight bias to the second-guessing process, we need to directly test whether hindsight subjects presume predictive superiority to that of a decision-maker who, like many decision-makers in real life, was not appraised in advance of the outcome to an uncertain situation.

A second critical question remains regarding the relationship between hindsight bias and judgments of others' decision. Specifically, does hindsight bias systematically distort evaluative judgment as it has been found to distort predictive judgment? That is, do we believe that we would have foreseen the likelihood of an unfortunate event (prediction), and consequently, felt that the original decision-maker should have foreseen what was only apparent to us in hindsight (evaluation)? Prior research has shown that attributions of responsibility are associated with the belief that the consequences of certain decisions were foreseeable (Chaiken & Darley, 1973; Finchum & Jaspers, 1980; Heider, 1958; Shaw & Shulzer, 1964; Walster, 1966). Thus, it is important to

investigate whether access to outcome information undermines the objectivity of hindsightful evaluations of others' decisions.

Finally, as Fischhoff (1975b) described, our second-guessing tendencies seem most exaggerated when a misfortunate event occurs. Prior research has demonstrated that the more serious the outcome of an event, the more responsibility is attributed to the perpetrator (Arkkelin, Oakley, & Mynatt, 1979; Chaiken & Darley, 1973; Walster, 1966). Although this finding has not always been replicated (Mitchell & Kalb, 1981; Walster, 1967), the gravity of the judgmental error represents an important contextual factor associated with second-guessing others. It is important to determine whether or not the context of second-guessing exaggerates any predictive or evaluative distortions found with outcome information alone.

An Experimental Investigation of Second-Guessing

Because the connection between hindsight bias and the objectivity of second-guessing others has crucial implications for understanding how we can fairly evaluate and learn from the decisions of others, the present study was designed to explore the answers to three questions. First, this study was designed to test whether the predictive distortions already associated with outcome information generalize to a context that includes another person's judgment. Unlike prior studies of hindsight, subjects in the present study were informed of an expert's assessment of a case that they were also asked to assess. Specifically, subjects read clinical case histories that included an expert recommendation along with the patient information. The outcome information

included at the end of the case history was designed to either support or not support the expert assessment. Based on prior evidence of people's distorted impressions of their predictive prowess, it was first hypothesized that subjects who received outcome information that contradicted an expert opinion would overestimate what they would have foreseen without the benefit of hindsight. Specifically, it was expected that these subjects would report significantly less predictive agreement with the expert than subjects who received either favorable or no outcome information.

The second major question this study regarded whether or not outcome information systematically biases the evaluations of another's judgment as it has been found to bias subjective predictive judgment. Based on prior evidence of people's inability to reconstruct the foresight of others (Fischhoff, 1975a), it was hypothesized that subjects who read of an outcome that contradicted the expert judgment would evaluate the expert judgment more harshly than subjects who received either favorable or no outcome information.

The third major question of the present study regarded whether or not a particular contextual factor, specifically the consequences facing someone as a result of a misfortunate or unfavorable outcome, would strengthen the bias. It was expected that the subjects in this study who received information pertaining to a pending malpractice suit filed against the expert would exhibit significantly less predictive agreement with the expert and assign significantly less favorable evaluation ratings to the expert judgment than would subjects who read only of an unfavorable outcome.

Results from this study have both theoretical and practical importance. In order to broaden our understanding of how hindsight bias operates, we need to know more about when and where it occurs. Results from this study show whether hindsight bias generalizes to situations involving another decision-maker and whether the bias has a predictable influence on the hindsightful evaluations of that decision-maker. Further, these results will show whether the context of hindsightful evaluations, specifically the mention of a formal investigation of the decision-maker's judgment, exaggerates the predictive and evaluative distortions associated with outcome information. These findings have critical implications in many practical settings, most notably, those associated with our legal system of evaluating the judgments of others. Not only is the tendency to second-guess others at the heart of many of our ethical and moral judgments but our system of due process is largely based on the hindsight of some to judge the foresight of others.

Before reviewing the findings from the present study, it is important to acknowledge that the manifestation of hindsight bias being investigated in this study may be more subtle than that investigated by prior hindsight research. When an individual's prediction does not eventuate, there may be human judgmental fault involved. However, the fact that the prediction did not bear true is not the appropriate indictment of the judgment. Rather, the appropriate criteria for an objective evaluation of an earlier decision include the review and use of only the information that was available at the time the decision was made. Although hindsight might contradict an earlier decision, the actual decision or judgment may have been eminently reasonable given

what was known. The major purpose of this study was to investigate whether second-guessers fall prey to hindsight bias, that is, evaluate a decision-maker on the basis of what became apparent only in hindsight.

CHAPTER II

METHOD

Subjects

One hundred and sixty introductory psychology students from Loyola University of Chicago participated in this study in partial fulfillment of a course requirement. Forty subjects were randomly assigned to one of four experimental conditions. Although subjects completed the materials in small groups, discussion of the study or of the materials was disallowed during the sessions.

Experimental Materials

The experimental materials used in this study included two authentic psychotherapy case histories of approximately 3,000 words, each taken from a clinical casebook by Goldstein and Palmer (1975). (See Appendix B.) Because the object of the present study concerned judgment rather than accuracy, clinical materials were chosen rather than passages from which there was a "right" answer. To maintain consistency with related research, two clinical cases were selected for use that were previously used in a related study of outcome information and social explanation (Ross, Lepper, Strack, & Steinmetz, 1977). These particular cases were selected because of their extensive descriptions of the patient's background, formative experiences, and symptoms at the time professional help was sought. As summarized below by Ross et

al.(1977), both cases provided an abundance of detailed and potentially relevant material that subjects could use to evaluate expert clinical judgment and the likelihood of subsequent events in the patient's life.

In one case, a young housewife, Shirley K., arrived at the clinic complaining of frequent headaches and dizziness. She expressed great anxiety over her uncontrollable thoughts of harming her 2-year-old son and repugnance for her current husband. Her history included an early and unhappy marriage to escape a manipulating mother and restrictive father, a subsequent liason with a musician who fathered her son and eventually committed suicide, and a current, abhorrent marriage to a lawyer who was frequently unemployed and unable to provide adequate support for his family. The report further describes Shirley's reactions to the suicide of her lover, the death of her father, and the commitment of her mother to a mental institution.

In the other case, George P., a middle-aged bachelor, was seen upon his readmission to a Veteran's Administration hospital suffering from stomach pains and a generalized weakness and malaise. His history included an early separation from his family, a period spent as a hobo, a subsequent term of military service, involvement in a number of unsuccessful business ventures, and his eventual return home to care for his mother until her death. The report also described George's previous hospital admissions and health problems, his potential difficulties with unadmitted alcoholism, and a recent dispute which led George to resign from his last job as a food machine servicman. (p. 819)

Two different clinical case histories were included to test whether any of the findings from this study might be restricted to a particular context. These two cases were chosen because they involved patients that differed on major dimensions such as gender, age, family background, and symptomatology.

The section of each case history that summarized the patient's recovery was not included in the study materials. Instead, subjects received fictitious information about a clinical judgment and treatment recommendation rendered by a staff clinical psychologist, as well as some fictitious information about subsequent events in the patient's life. The feasibility of all the fictitious information was reviewed by two

members of the clinical faculty and two clinical graduate students from the Psychology Department at Loyola University of Chicago. Subjects' reactions to the case histories in general, and to the case endings in particular, were explored during pilot testing. Excluding the fictitious information included at the end, George's case history was presented to subjects exactly as it appeared in the casebook. However, due to subjects' reactions during pilot-testing, Shirley's case material was modified for use in this experiment. Specifically, a majority of the pilot subjects who read of Shirley's favorable response to treatment perceived the likelihood of her recovery to be very small given her violent fantasies toward her son. To provide a version that was more believable to this subject population, the favorable ending written for Shirley was used, but all mention of Shirley's violent thoughts towards her son was excluded from the case history.

Design and Procedure

Upon their arrival, subjects were handed a packet of materials . The first page of the packet was an introductory statement that briefed subjects on the study's purpose and the nature of the tasks. (See Appendix A.) Subjects were told that the study involved clinical judgment, with the purpose of revealing how people like themselves judged certain clinical situations, and that the study tasks included reading a case history "much as it appears in an authentic clinical case textbook" and answering certain questions. The specific wording of the questions varied according to which client, i.e., Shirley or George, that subjects were assigned to evaluate and which outcome information subjects had received. (See Appendix C for a complete listing of all questions.)

The experimental design is summarized in Table 1. Subjects were assigned according to a block randomized procedure to one of four outcome conditions. Sex and case were also balanced. Thus, each block comprised 16 combinations of gender, case, and outcome condition.

All subjects assigned to a case received the same statement of clinical judgment and treatment recommendation. In Shirley's case, subjects read that the clinical psychologist assigned to the case, Dr. M., judged that Shirley's presenting physical symptoms, specifically her headaches and dizziness, were caused by emotional issues. Dr. M. recommended that Shirley immediately begin weekly outpatient psychotherapy to work on her emotional issues. All subjects who were assigned to read George's case history read that Dr. M. judged George to be emotionally capable of leaving the hospital. Dr. M. also recommended that George see a vocational counselor to be placed immediately in a suitable job and that George begin weekly outpatient counseling to help him adjust to leaving the hospital and functioning in society.

The four outcome conditions reflected variation in the outcome information included after the statement of clinical judgment and treatment recommendation.

Control Condition

Subjects assigned to this condition did not receive any patient outcome information or mention of a malpractice suit.

Table 1

Study Design

Condition	Description	Case #1: Shirley	Case #2: George	TOTAL
Control	No patient outcome information	10 Men 10 Women	10 Men 10 Women	40
Favorable	Favorable patient outcome information	10 Men 10 Women	10 Men 10 Women	40
Unfavorable	Unfavorable patient outcome information	10 Men 10 Women	10 Men 10 Women	40
Malpractice	Unfavorable patient outcome and mention of a malpractice suit	10 Men 10 Women	10 Men 10 Women	40
TOTAL		80	80	160

Favorable Condition

Subjects in this condition received information of a favorable patient outcome. The outcomes assigned to subjects in this condition closely resembled the actual outcomes reported in the casebook. The 20 subjects who were assigned to read Shirley's case history read that Shirley followed the treatment recommendation and that her physical symptoms did in fact disappear as she progressed in weekly outpatient psychotherapy. Subjects who read George's case history were informed that the hospital discharge, placement in a new job and weekly counseling sessions helped greatly to build George's confidence and sense of well-being. They read that George's physical symptoms subsided as he became increasingly secure about functioning in society.

Unfavorable Condition

Subjects in this condition received fictitious outcome information about the patient's unfavorable response to treatment. The 20 subjects assigned to Shirley's case read that her physical symptoms worsened even before beginning psychotherapy, and that after seeing a neurologist, Shirley discovered that her headaches and dizziness were caused by a growing cerebral tumor. The case ending also stated that Shirley suffered irreversible brain damage that may have been avoided had she received medical attention right away. The case ending designed for Shirley was intended to illustrate an expert error in clinical judgment based on the fact that Dr. M.'s prediction of the emotional basis of Shirley's physical symptoms was not supported by subsequent events. The case ending was also intended to illustrate an expert protocol error

based on the fact that Dr. M. did not investigate possible physical causes for the headaches and dizziness as a routine precautionary measure. As a point of contrast, the unfavorable case ending designed for George was intended to reflect a judgmental miscalculation of the extent of patient psychopathology. Specifically, the 20 subjects assigned to read about George were told that he was immediately overwhelmed with anxiety upon leaving the hospital and was unable to see a vocational counselor or to attend his counseling sessions. Subjects were told that George was subsequently re-admitted to the hospital after a suicide attempt that left him with irreversible physical problems.

Malpractice Condition

Subjects in this condition received the same patient outcome information as subjects in the unfavorable condition along with a statement about a \$500,000 malpractice suit filed against Dr. M. In Shirley's case, Dr. M. was being sued for not referring Shirley immediately to a physician to check on her physical symptoms. In George's case, Dr. M. faced malpractice charges for not referring the patient immediately to an inpatient psychiatric unit for more observation and help.

Manipulation Check

Because the study hypotheses pertained to the influence of outcome information on predictive and evaluative judgment, a manipulation check was administered to verify that subjects had attended to and retained the particular outcome information included at the end of their case history. After subjects had completed and returned all study materials, they were asked to check which of a series of outcomes they had read.

To be included in the study, it was necessary for all subjects in the favorable condition to indicate that "the patient had improved", for all subjects assigned to Shirley's case in either the unfavorable or malpractice condition to indicate that "the patient was diagnosed by a physician as having a tumor", for all subjects assigned to George's case in either the unfavorable or malpractice condition to indicate that "the patient had attempted suicide", for all control subjects to indicate that "there was no information about any of the above outcomes happening."

As a result of the manipulation check, 12 subjects, 8 men and 4 women, were excluded from the study. The unfavorable condition involving Shirley's case history emerged as more problematic in terms of subjects' attention to outcome; 10 of the 12 excluded subjects had been assigned to read this version of the patient outcome. Eight of these 10 subjects indicated on the manipulation check that no outcome information was available. It is interesting to note that, even though subjects in the malpractice condition also received the same outcome information, none of these subjects failed the manipulation check. It may be that the mention of the malpractice suit heightened the salience of the outcome information.

Dependent Measures

Predictive Judgment

Subjects were required to make a series of predictions regarding the likelihood of various patient-related outcomes. All likelihood questions were presented as foresightful predictions. That is, before making the first prediction, all subjects were instructed as follows:

Assume that you are a clinical psychologist and Shirley (George) went to see you instead of Dr. M. Assume that you just completed the interview with Shirley (George) wherein information about her (his) background, formative experiences, and current complaints was discussed... Remember that you just met with Shirley (George).

Similar instructions were repeated before all subsequent likelihood questions.

Subjects were asked to predict events that pertained to: (a) the validity of a clinical assessment; (b) the appropriateness of a treatment recommendation; and (c) the likelihood of a specific patient response to the treatment. First, subjects rated the chances that Dr. M.'s clinical assessment of the patient would bear true. Those assigned to Shirley's case were asked to predict the chances that Shirley's symptoms "are" or "are not" caused by emotional issues. (These items were worded to represent foresightful predictions and subjects evaluated the two mutually exclusive event possibilities). Those assigned to George's case were asked to predict the chances that George "is" or "is not" emotionally capable of leaving the hospital.

Next, subjects were asked to predict whether Dr. M.'s treatment recommendation would prove to be appropriate for the patient. In Shirley's case, subjects were asked to predict the chances that weekly outpatient psychotherapy "is" or "is not" appropriate treatment for Shirley. Subjects assigned to read George's case history predicted the chances that a hospital discharge, a suitable job, and weekly counseling "is" or "is not" appropriate treatment for George. Although the questions for both Shirley and George subjects addressed Dr. M.'s treatment recommendation, the content of the questions was differentially complex for Shirley and George subjects. In particular, the treatment recommen-

dation for George involved three parts (hospital discharge, a suitable job, and weekly counseling) as opposed to the one treatment element recommended for Shirley (weekly outpatient therapy).

The final likelihood question required that subjects across the four outcome conditions predict the chances that two mutually exclusive patient outcomes would occur. One outcome summarized the patient responding favorably to the recommended treatment; the other outcome described the patient responding unfavorably to the recommended treatment. For Shirley, the two outcomes were summarized as follows:

Shirley will learn in therapy to talk more openly about her feelings about past and current relationships. As she progresses in therapy, her physical symptoms will disappear and her relationships with her husband and son will improve.

Before beginning therapy, Shirley's physical symptoms will worsen. Shirley will see a physician and discover that her physical symptoms are caused by a physical condition.

For George, the favorable and unfavorable outcomes were summarized as follows:

The new job and the weekly counseling sessions will help greatly to build George's confidence and sense of well-being. George will become increasingly secure about functioning in society and his physical symptoms will subside.

Immediately after being discharged from the hospital, George will become overwhelmed with anxiety. George will be unable to leave his apartment and will attempt suicide.

All likelihood questions were formatted comparably to those in prior investigations of hindsight bias. That is, subjects were asked to assign "forced-sum" probability estimates (estimates that sum to 100%)



to mutually exclusive events. Although hindsight bias has been shown to withstand diverse question formats (Fischhoff, 1982b), the difference between forced-sum and open-ended probability estimates has not been analyzed. Therefore, to explore whether open-ended estimates would yield different results, subjects were asked to generate both forced-sum and open-ended predictions for questions pertaining to the likelihood of a specific patient response. Procedurally, the open-ended estimates were required before the forced-sum estimates. Subjects were requested to first assign a single probability to the favorable patient outcome without any mention of an alternative ending or of forced-summing. Next subjects were asked to assign another open-ended probability to the unfavorable patient outcome. Finally, subjects were presented with both patient outcomes and asked to assign forced-sum estimates.

For the open-ended estimates, all subjects were presented with a visual display of percentages that ascended from 0% to 100% in increments of 10. Two values were labeled: 0% was labeled as "No Chance Of Occurring" ; 100% was labeled as "Certain of Occurring." Subjects were asked to circle one of the 11 percentages that best represented the chances that the favorable outcome would occur. Given some known difficulties with unanchored probability estimates (Hogarth, 1981), a visual display with only 11 values was included to help structure an open-ended probability question. Although this modification may have facilitated the subjects' task, this meant that the range of appropriate responses for the open-ended probability estimates was not identical to the range accepted for the forced-sum estimate.

All likelihood questions were based on two mutually exclusive alternatives. For instance, the first likelihood measure represented the perceived chances of making the same clinical assessment as Dr. M. The alternative measure represented the perceived chances of not making the same clinical assessment. It should be noted that the study hypotheses were framed to reflect the power of outcome information to decrease the perceived likelihood of events and to decrease the perceived favorableness of another's judgment. Thus, the dependent measures selected for discussion pertain only to estimates of agreement with Dr. M. For instance, the first likelihood measure represented the perceived chances of making the same clinical assessment as Dr. M. Similarly, the other prediction measures presented here correspond to the perceived likelihood of recommending the same treatment plan as Dr. M. and the perceived likelihood of a favorable patient outcome that Dr. M. predicted based on the clinical assessment and treatment plan.

As discussed by Winer (1971), proportion data involve predictable departures from normality. To correct for this artifact, an arcsin transformation was calculated for each of the probability measures (Winer, 1971). Although the transformed measures provide a "cleaner" picture of the data, the units of measurement from the transformed measures are less familiar than percentage units. Thus, for presentation purposes, the untransformed responses, specifically, subjects percentage predictions, are reported.

Evaluative Judgment

A major goal of this study was to investigate evidence of the hindsight effect in evaluative judgment. A global index was calculated for each subject to represent a general evaluation rating of Dr.M. This index was the average response to four different rating questions. The index for one subject, who failed to respond to the final index item, was based on the average response to three and not four items. Cronbach's Alpha test for internal consistency revealed high inter-item reliability (Alpha = .87).

Three of the rating questions included in the index involved evaluating Dr. M.'s judgment on a six point Likert scale that ranged from labeled values 1,2,and 3,signifying very poor, poor, or slightly poor judgment,respectively, through values 4,5,and 6, signifying slightly good, good, and very good judgment. Subjects were asked to use this scale to rate: "the quality of Dr. M.'s overall clinical judgment;" Dr. M.'s judgment either that "Shirley's symptoms were caused by emotional issues" or that "George was emotionally capable of leaving the hospital;" and Dr. M.'s treatment recommendation that either "Shirley begin weekly outpatient psychotherapy to work on her emotional issues" or that "George be discharged from the hospital, that he see a vocational counselor to be placed in a suitable job, and that he begin weekly outpatient counseling to help with the adjustment."

The final evaluation question used in the index required subjects to use a six point Likert scale to indicate their level of agreement with the statement: "Dr. M. made an appropriate recommendation." The six values were anchored from "disagree strongly" to "agree strongly."

Along with the index items, other evaluative questions were included on the questionnaire to explore the relationship between outcome information and other types of evaluative perceptions. For instance, subjects were asked to use the same six point Likert agreement scale described above to indicate their level of agreement with statements that summarized some common points of dispute between foresightful and hindsightful decision-makers. The statements, tailored to this context, included:

1. Shirley (George) represented a difficult case for any clinical psychologist.
2. There was not enough information about Shirley (George) for Dr. M. to make an appropriate recommendation.
3. Dr. M. should have discussed the case with other professionals.
4. No matter what, (1) Shirley's physical symptoms should have been checked out by a physician; or (2) George should have been kept in the hospital for more emotional help.

Another major issue associated with hindsightful evaluations is the issue of blame. Attributions of blame have been associated with the belief that the consequences of certain decisions and actions were foreseeable (Chaiken & Darley, 1973; Fincham & Jaspers, 1980; Heider, 1958; Shaw & Sulzer, 1964; Walster, 1966). To begin investigating the relationship between outcome information and attributions of blame, subjects were asked to distribute forced-sum proportions of blame for the unfavorable patient outcome to Dr. M. and to the patient.

A final evaluation question involved ranking Dr. M.'s treatment recommendation from "least preferred" to "most preferred" from among four other treatment alternatives. For both cases, one alternative referred to arranging for more information from the patient before making a definitive recommendation and another alternative referred to meeting with other professionals to discuss the case before making a definitive recommendation. These options were included to assess two of the more common hindsightful observations, namely, that more information or more collaboration was needed.

The other two alternatives that subjects were asked to rank were designed to represent treatment plans that, when compared to Dr. M.'s recommendation, represented either a slightly more cautious approach or a much more cautious approach. More conservative alternatives were included because of the informally observed tendency for hindsightful evaluators to say: "You should have been more careful." In Shirley's case, the slightly more cautious recommendation advised Shirley to begin weekly psychotherapy and see a physician if her physical problems continue. (In Dr. M.'s treatment plan, there was no mention of a possible need for medical intervention.) The even more cautious approach involved advising Shirley to see a physician right away. In George's case, the slightly more cautious approach involved a hospital discharge and placement in a halfway house for men as a transition to living and working on his own. The even more conservative plan involved referring George immediately to the psychiatric unit of the hospital.

The results of analyses using all of the above dependent measures are summarized in the next chapter.

CHAPTER III

RESULTS

Hindsight Bias and Predictive Judgment

Overview

The dependent measures selected to test the influence of outcome information on predictive judgment were subjects' forced-sum estimates of: (a) the chances of making the same clinical assessment as Dr. M.; (b) the chances of recommending the same treatment plan as Dr. M.; (c) the chances of a favorable patient response given the clinical assessment and treatment plan recommended by Dr. M. Before testing the influence of specific outcome information on each dependent measure, univariate analyses of variance were conducted to confirm the presence of an overall effect of outcome information across the four outcome conditions. Once the overall effect was found, analytical comparisons were conducted to test two hypotheses. The first hypothesis stated that unfavorable outcome information would diminish the probabilities assigned to each dependent prediction measure. Specifically, the expectation was that subjects in the unfavorable condition would assign significantly lower probabilities to each of the three prediction measures than subjects in either the favorable or control condition. The second hypothesis stated that information regarding a malpractice suit filed against the expert Dr. M. would exaggerate the effect of outcome information suggested by the first hypothesis. Specifically, the expectation

was that subjects in the malpractice condition would assign significantly lower probabilities to the three dependent prediction measures than subjects in the unfavorable condition. For these and all subsequent analyses, the .05 level of statistical significance was applied.

Before pursuing the univariate analyses of variance, correlations among the three forced-sum estimates were examined. Moderate correlations were found among all three likelihood estimates. The correlation between estimates pertaining to the clinical assessment and treatment recommendation was .63. The correlation between estimates of the clinical assessment and favorable patient outcome was .53. Finally, the correlation between estimates of the treatment plan and favorable patient outcome was .55. Because none of these correlations were so high as to suggest that the three estimates reflected a single prediction, univariate analyses of variance and analytical comparisons were conducted to test the study hypotheses for each of the three prediction measures: the clinical assessment, the treatment plan, and the outcome scenario.

The Clinical Assessment

Concerning the first prediction, the perceived chances of making the same clinical assessment as Dr. M, Table 2 shows that significant mean differences were found as a function of outcome condition, $F(3,155)=11.25$. As can be seen in Table 2, there was little difference in the average probability estimates between subjects in the unfavorable and the malpractice conditions. There was also a minimal difference in the average probability estimates between subjects in the favorable and control conditions. However, subjects who received unfavorable

patient outcome information, in either the unfavorable or malpractice conditions, were different in their predictions than subjects in the favorable and control conditions. Table 2 shows that receiving unfavorable outcome information diminished subjects' perceptions of the chances of making the same clinical assessment as Dr. M.

Along with an overall group effect, there was an overall effect for case. Subjects assigned to read Shirley's case history gave higher probability estimates for this item than subjects assigned to read about George (72.0% versus 54.0%, respectively), $F(1,143)=30.57$. Closer examination of the cell means revealed that the case differential was most pronounced for subjects who received unfavorable patient outcome information in either the unfavorable or malpractice conditions. Shirley subjects in the unfavorable condition assigned considerably higher probabilities to the chances of making the same clinical assessment as Dr. M. than George subjects in the unfavorable condition (64.6% versus 37.0%, respectively). Further, Shirley subjects in the malpractice condition assigned higher estimates to this item than George subjects in the malpractice condition (67.0% versus 43.4%, respectively). Thus, Shirley's unfavorable ending generated higher estimates of this prediction than did the unfavorable patient ending added to George's case history.

Table 2

Subject Predictions as a Function of Outcome Condition

Subject Predictions	Control	Favorable	Unfavorable	Malpractice	<u>N</u> *	<u>F</u>	<u>df</u>	<u>p</u>
1. Chances of subject making the same clinical assessment as the expert, Dr. M.								
Mean	72.1%	74.5%	50.8%	55.2%	159	11.25	(3,155)	<.05
<u>SD</u>	19.6	14.7	26.6	26.0				
2. Chances of subject recommending the same treatment plan as the expert, Dr. M.								
Mean	73.8%	75.1%	48.2%	63.6%	160	14.67	(3,156)	<.05
<u>SD</u>	15.9	16.9	24.6	23.3				
3. Chances of a favorable patient outcome given the clinical assessment and treatment plan of the expert, Dr. M.								
Mean	74.7%	79.8%	50.0%	55.0%	160	23.60	(3,156)	<.05
<u>SD</u>	13.6	12.6	21.8	25.1				

*One subject failed to respond to the first prediction item.

**Statistically significant, Cochran's C = .43, p <.05

Table 2 also presents the standard deviations associated with each outcome condition. Although statistically nonsignificant, Cochran's $C = .36$, $p < .1$, there was a trend for subjects in both the unfavorable and malpractice conditions to be more variable in their responses than subjects in the favorable and control conditions. Specifically, a comparison of the average standard deviations reveals that subjects in the favorable and malpractice conditions were approximately 75% more variable in their responses than subjects in the favorable condition and approximately 33% more variable in their responses than subjects in the control condition. Thus, as compared to the favorable patient outcome, the unfavorable patient outcome tended to produce an extended range of subject responses as well to have significantly diminished values of the subject predictions.

Having found significant mean differences across all outcome conditions, a series of analytical comparisons were conducted to test the specific hypotheses. The first hypothesis, specifically, that unfavorable patient outcome information would decrease predictive agreement with the expert, was confirmed with this dependent measure. Subjects in the unfavorable condition considered it more unlikely that they would make the same clinical assessment as Dr M. than did subjects in the favorable condition, $F(1,155) = 21.90$. Further, subjects in the unfavorable condition perceived making the same clinical assessment as more unlikely than the control subjects, who had received no patient outcome information, $F(1,155) = 18.15$. There was no significant difference between control subjects and those who received favorable outcome information on this item. The case factor did not influence the overall significance or the overall pattern of the above results.

A further major study hypothesis stated that hindsight bias would be exaggerated as a function of information regarding a malpractice suit. Specifically, the expectation was that subjects in the malpractice condition would report significantly less predictive agreement with the expert than subjects in the unfavorable condition. This hypothesis was not supported by these prediction data. As can be seen in Table 2, subjects in the malpractice condition did not consider the chances of making the same clinical assessment as Dr. M. to be smaller than subjects in the unfavorable condition. These results were also unaffected by the case factor.

The Treatment Recommendation

The second dependent prediction measure pertained to the perceived chances of recommending the same treatment plan as Dr. M. As seen in Table 2, significant mean differences were found as a function of outcome condition for this measure, $F(3,156)=14.67$. Overall, subjects in the unfavorable and malpractice conditions gave less comparable responses than they did on the first measure (48.2% and 63.6%, respectively). However, subjects in the unfavorable and malpractice conditions assigned lower probabilities to the chances of recommending Dr. M.'s treatment plan than subjects in either the favorable or control conditions. A similar trend with respect to within group variability is also shown in Table 2. Although statistically nonsignificant, Cochran's $C = .36$, $p < .1$, there was a trend for subjects in the unfavorable and malpractice conditions to be more variable in their responses to this measure than subjects in the control and favorable conditions. Thus, as with the

first prediction item, unfavorable patient outcome information appeared to have extended the range of subject responses as well as to significantly diminish the value of subject responses for this item.

Along with an overall group effect, there was a significant case effect found with the second prediction measure, $F(1,144)=8.10$. As with the first prediction measure, Shirley subjects assigned higher probabilities to this item than George subjects (69.9% versus 60.75%, respectively). Closer examination of the cell means revealed that the mean difference in predictions was largest between subjects in the unfavorable and malpractice conditions. Specifically, Shirley subjects in the unfavorable condition assigned higher probabilities to the chances of making the same treatment recommendation as Dr. M. than George subjects in the unfavorable condition (56.8% versus 39.8%, respectively). Similarly, Shirley subjects in the malpractice condition assigned higher probabilities to this item than George subjects in the malpractice condition (73.5% versus 53.8%, respectively). As with the first prediction item, Shirley's unfavorable ending generated more agreement with Dr. M. than George's unfavorable ending.

Having found overall mean differences, analytical comparisons were conducted that confirmed the first study hypothesis with this prediction measure. Subjects who received unfavorable patient outcome information considered it more unlikely that they would recommend the same treatment plan as Dr. M. than subjects who either received favorable patient outcome information, $F(1,156)=34.30$, or subjects who received no patient outcome information, $F(1,156)=31.18$. As with the prior likelihood measure, analytical comparisons did not reveal a significant dif-

ference between control subjects and those who received favorable patient outcome information on this measure. As compared to favorable or no patient outcome information, unfavorable patient outcome information diminished the perceived probability of making the same treatment recommendation as Dr. M. It is also interesting to note that, when compared to no patient outcome information, favorable patient outcome information did not significantly increase the perceived probabilities associated with this item. The case factor exerted no influence on the overall significance or pattern of results found with these analytical comparisons.

The hypothesis that malpractice information would exaggerate the hindsight effect was again not confirmed with this measure. There was a significant mean difference between subjects in the unfavorable and malpractice condition, $F(1,156)=11.23$; however, the difference was in the opposite direction than hypothesized. As shown in Table 2, subjects in the malpractice condition considered it more likely that they would recommend the same treatment plan as Dr. M. than did subjects in the unfavorable condition (63.6% versus 48.2%, respectively). Despite this contrast with the unfavorable condition, subjects in the malpractice condition did report significantly less predictive agreement with Dr. M.'s treatment plan than did subjects in either the favorable condition, $F(1,156)=6.28$, or in the control condition, $F(1,156)=4.94$. There were no case effects associated with these latter findings.

The Outcome Scenario

The third likelihood estimate pertained to the perceived probability of a favorable patient outcome given Dr. M.'s clinical assessment and treatment plan. As summarized in Table 2, significant mean differences were found as a function of outcome condition, $F(3,156)=23.60$. As with the clinical assessment prediction, there was little difference in mean response on this measure between subjects in the favorable or control conditions or between subjects in the unfavorable and malpractice condition. However, there was an appreciable mean difference between the subjects in the favorable or control conditions and subjects in the unfavorable or malpractice conditions. As seen in Table 2, receiving unfavorable patient outcome information decreased the perceived probability of a favorable patient outcome as compared to receiving favorable or no patient outcome information.

Along with an overall mean differences as a function of outcome information, the variances associated with the group mean responses were significantly different, Cochran's $C = .43$. As seen in Table 2, the two groups of subjects who received unfavorable patient outcome information were more variable in their estimates than subjects who received favorable or no patient outcome information. This pattern was significant both with the transformed and untransformed values suggesting that the finding is more than artifactual. (See Method for discussion of transformed and untransformed measures.) Although statistically nonsignificant, the same trend of increased variability for unfavorable and malpractice subjects was apparent with the other two prediction measures.

The issue of differential variability is less a statistical concern than a point of substantive interest within the context of the hindsight phenomenon. It has been demonstrated that the analysis of variance is quite robust with respect to the assumption of homogeneity of variance (Harris, 1985; Hays, 1981; Tabachnick & Fidel, 1983; Winer, 1971). Further, the standard tests for variance differences in the analysis of variance are notoriously sensitive tests (Hays, 1981; Tabachnick & Fidel, 1983; Winer, 1971). Therefore, the differential variability detected by the Cochran's test does not necessarily undermine the validity of the test for mean differences using the analysis of variance. But the differential variances among outcome conditions may represent a meaningful concomitant of hindsightful evaluations.

In terms of specific tests of the study hypotheses, analytical comparisons again confirmed the presence of hindsight bias. Specifically, subjects in the unfavorable condition gave significantly lower probability estimates of a favorable patient outcome than did subjects in either the favorable condition, $F(1,156)=49.24$, or the control condition, $F(1,156)=33.84$. Control subjects did not give significantly different estimates than subjects in the favorable condition.

Support of the hypothesis that malpractice information would exaggerate the hindsight effect was not found. However, analytical comparisons did expose the nature of a significant interaction effect found in the univariate analysis between outcome condition and subject gender, $F(3,144)=2.74$. Male subjects in the malpractice condition assigned lower probabilities to the chances of a favorable patient outcome than did

men in the unfavorable condition (47.75% versus 54.50%, respectively). However, significant differences were not found between the group means. In contrast, female subjects in the favorable and malpractice conditions were found to give significantly different estimates, $F(1,156)=7.77$. But, as discovered with the second likelihood estimate, the difference was in the opposite direction than hypothesized for all subjects. Specifically, the average value for women in the unfavorable condition was 45.50% as compared to a value of 62.25% for women in the malpractice condition. The gender by condition interaction did not affect the overall significance or the overall pattern of results for the earlier tests of the first study hypothesis.

Open-ended Versus Forced-Sum Measures

To allow comparisons with prior research on hindsight bias, all of the preceding analyses were conducted with forced-sum probability estimates. A secondary goal of the present research was to repeat the same sequence of analyses with an open-ended probability measure to determine whether the hindsight bias effect would generalize across a different type of dependent measure. Thus, for the third prediction, i.e. the outcome-specific prediction, subjects were asked to generate both open-ended and forced-sum probability estimates. (See Method for a detailed description of the open-ended estimates.) Before pursuing the univariate analyses of variance with the open-ended estimate, the correlation between the forced-sum and open-ended estimate of the favorable patient outcome was calculated and found to be moderate ($r = .63$).

As with the forced-sum estimate, the univariate analysis of variance revealed significant mean differences as a function of outcome condition, $F(3,156)=13.61$. Based on the open-ended estimate, there was little difference in mean predictions of a favorable patient outcome between subjects in the unfavorable and malpractice conditions, (53.9% and 54.0%, respectively). This was also true using the forced-sum estimate. There was more difference in mean response with the open-ended estimate between subjects in the favorable and control conditions (77.0% and 65.9%, respectively) than found with the forced-sum estimate. However, the major result found with the forced-sum estimate was replicated with the open-ended measure. Subjects in the unfavorable and malpractice conditions assigned lower open-ended probabilities to the favorable outcome than subjects in either the control or favorable conditions.

Two main effects were found with the open-ended estimate that were not found with the forced-sum estimate. There was a trend for women to assign higher open-ended probabilities to the favorable patient outcome than men, 65.88% versus 50.50%, respectively, $F(1,144)=4.73$. A closer examination of cell means did not reveal a pattern for the gender differential to be more clearly associated with some outcome conditions more than others. The second main effect involved the case factor. Consistent with prior results, a favorable Shirley outcome received higher open-ended estimates than did a favorable George outcome (66.19% versus 59.19%, respectively), $F(1,144)=5.70$. A closer examination of cell means revealed that the largest case differential was between subjects in the unfavorable condition. Specifically, Shirley subjects in the unfavorable condition assigned higher open-ended probabilities to a fav-

orable patient outcome than did George subjects in the unfavorable condition (60.0% versus 47.8%, respectively). There were no significant differences in variances among the outcome conditions as found with the forced-sum measure.

Analytical comparisons with the open-ended estimate confirmed the first study hypothesis. As with the forced-sum measure, subjects who received unfavorable patient outcome information gave significantly lower open-ended probabilities than subjects who received either favorable patient outcome information, $F(1,156) = 29.64$, or no patient outcome information, $F(1,156) = 7.98$. In contrast to results with the forced-sum measure, analytical comparisons revealed differences in open-ended estimates between favorable and control subjects, $F(1,156) = 6.85$. Subjects who received favorable patient outcome information tended to give higher predictions of a favorable patient outcome than subjects who received no patient outcome information (77.00% versus 64.88%, respectively). Finally, support of the hypothesis that malpractice information would exaggerate the hindsight effect was not found with the open-ended estimate. Subjects in the unfavorable and malpractice conditions did not differ in their open-ended estimates.

Hindsight Bias and Evaluative Judgment

The Evaluation Index

A final major hypothesis of the present study stated that hindsight bias would influence subjects' ratings of the quality of Dr. M.'s judgment. Specifically, the expectation was that subjects in the unfavorable condition would rate Dr. M.'s judgment less favorably than sub-

jects in either the favorable or control conditions. It was also hypothesized that the hindsight bias would be exaggerated with information about consequences facing the expert. Specifically, the expectation was that subjects in the malpractice condition would give more unfavorable ratings of Dr. M.'s judgment than would subjects in the unfavorable condition. As a measure of subjects' evaluations of Dr. M.'s judgment, a global evaluation index was calculated for each subject. This index was the average response to four different ratings. In each case, higher values represented more favorable evaluations of Dr. M.'s judgment. Before conducting analytical comparisons as specific tests of the study hypotheses, an analysis of variance was conducted that confirmed an overall significant effect of outcome condition on the global evaluation index, $F(3,156)=40.52$. As seen in Table 3, subjects in both the unfavorable and malpractice conditions gave lower evaluations of Dr. M.'s judgment than did subjects in either the control or favorable conditions.

Along with a significant group effect, there was also a significant case effect, $F(1,144)=4.41$. Subjects assigned to read Shirley's case gave more favorable evaluations of Dr. M.'s judgment than George subjects (4.25 versus 3.98, respectively). Closer examination of the cell means revealed that the case differential was most pronounced for subjects in the unfavorable condition. Shirley subjects in the unfavorable condition assigned more favorable ratings to Dr. M.'s judgment than did George subjects in the unfavorable condition (3.62 versus 2.91, respectively).

Table 3 also shows that the variability associated with the group mean responses was significantly different as a function of outcome information, Cochran's $C = .38$. Subjects receiving unfavorable outcome information, in either the unfavorable or malpractice conditions, were significantly more variable in their responses than subjects who received favorable outcome information. The largest difference in group variability was found between subjects in the unfavorable and the favorable conditions. Specifically, subjects in the unfavorable condition were more than twice as variable in their overall evaluation of Dr. M.'s judgment as subjects in the favorable condition. Table 3 also shows that there was minimal difference in group variability on the evaluation index for subjects in the unfavorable and malpractice conditions. Thus, receiving unfavorable outcome information extended the range of subject ratings and significantly diminished the value of the ratings for evaluative judgment as it did for certain measures of predictive judgment.

After confirming the overall effect of outcome information on subjects' evaluations of Dr. M.'s judgment, analytical comparisons were conducted to test the specific study hypotheses. The first study hypothesis, specifically that unfavorable outcome information would diminish subjects' ratings of the quality of Dr. M.'s judgment, was confirmed. Negative outcome information biased subjects' evaluations in the predicted direction. Specifically, subjects in the unfavorable condition gave significantly lower expert evaluations than subjects who received favorable patient outcome information, $F(1,156)=92.52$, and than subjects who received no patient outcome information, $F(1,156)=54.11$. Significant differences were also found between subjects

who received favorable patient outcome information and control subjects, $F(1,156)=5.12$. On the average, subjects who received favorable outcome information were more impressed with Dr. M.'s judgment than subjects who had no access to outcome information.

The hypothesis stating that mention of a malpractice suit would exaggerate the bias was not confirmed by the analytical comparisons. As seen in Table 3, subjects in the malpractice and unfavorable conditions did not differ in their evaluations of Dr M.

Table 3

Global Evaluation Index by Outcome Condition

Dependent Measure	Outcome Condition				<u>N</u>	<u>F</u>	<u>df</u>	<u>p</u>
	Control	Favorable	Unfavorable	Malpractice				
Global Evaluation Index								
Mean	4.58	5.05	3.26	3.57	160	40.52	(3,156)	<.05
<u>SD*</u>	.73	.40	1.03	1.01				

*Statistically significant; Cochran's C = .38

Selected Evaluative Judgments

Along with the index items, other evaluative questions were included on the questionnaire to explore possible relationships with certain types of outcome information. These questions assessed: (a) the proportion of blame assigned to Dr. M. for the unfavorable patient outcome; (b) agreement with four descriptive statements about the nature of the case and alternative treatment plans; and (c) rank orderings of Dr. M.'s treatment recommendation relative to four alternative treatment solutions. Subject responses to these dependent measures were compared as a function of the four outcome conditions.

The analysis of variance was used to test mean differences in the proportion of blame assigned to Dr. M. as a function of the four outcome conditions. Significant mean differences were found, $F(2,177)=3.79$. However, the overall mean differences were not interpretable because of a significant group by case interaction, $F(2,108)=3.66$. Table 4 shows that among Shirley subjects, those in the unfavorable condition assigned the least amount of blame to Dr. M. For George subjects, the group means were not significantly different. These results might be related to the recurring finding that Shirley subjects in the unfavorable condition expressed more predictive agreement and more evaluative support of Dr. M.'s judgment than did George subjects in the unfavorable condition.

Table 4

Supplemental Evaluations as a Function of Outcome Condition

Evaluation Item	Control	Favorable	Unfavorable	Malpractice	<u>N</u>	<u>F</u>	<u>df</u>	<u>p</u>
Proportion of Blame Assigned to Dr. M.								
Shirley Subjects	51.5%	NA*	22.6%	45.0%	60	8.18	(2,57)	<.05
George Subjects	66.6%	NA*	62.9%	59.0%	60	.48	(2,57)	NS
Agreement of Need for More Conservative Treatment**								
	3.42	3.42	4.82	4.77	158	12.80	(3,155)	<.05

*The question of blame was not relevant to subjects who received favorable outcome information.

**The agreement scale ranged from "1" (disagree strongly) to "6" (agree strongly).

Subjects were asked to use a six point Likert scale to indicate their level of agreement with four statements that summarized possible points of contention between foresightful and hindsightful observers. These points addressed: (a) the perceived difficulty of the clinical case; (b) the perceived need for more patient information before making a treatment recommendation; (c) the perceived need for a professional consultation before making a treatment recommendation; and (d) the perceived need for a more conservative treatment plan than the one Dr. M. recommended. In Shirley's case, the more conservative treatment plan recommended that Shirley see a physician immediately. In George's case, the more conservative treatment plan involved keeping George in the hospital.

Outcome condition did not have a significant influence on the perceived need for more patient information or on the perceived need for a professional consultation. Nor did outcome information influence subjects' assessments of the overall difficulty of the case. However, as presented in Table 4, subjects' level of agreement regarding the need for the more conservative treatment approach was found to be a function of outcome condition, $F(3,155)=12.80$. Subjects in the unfavorable or malpractice conditions were more likely to agree with the need for a more conservative treatment approach. A case effect was also found, $F(1,137)=78.90$. Overall, Shirley subjects were more likely to agree with this need than were George subjects(4.96 versus 3.39, respectively).

In addition, subjects were asked to rank order five treatment plans from "1"(most preferred) to "5"(least preferred). Along with Dr. M.'s specific recommendation for Shirley or George, other treatment

solutions listed included: (a) arranging for more patient information; (b) discussing the case with other professionals; (c) recommending a somewhat more cautious approach than Dr. M.; and (d) recommending a much more cautious approach than Dr. M. In Shirley's case, the somewhat more cautious treatment plan involved advising her to see a physician if her physical problems continued; the much more cautious plan advised her to see a physician immediately. In George's case, the somewhat more cautious plan advised him to enter a halfway house; the much more cautious plan referred George immediately to the psychiatric unit of the hospital.

Kendall's coefficient of concordance was calculated to determine whether subjects within conditions tended to rank order the five treatment plans similarly. Given previous differences associated with case, Kendall's test for concordance was conducted separately for Shirley and for George subjects. As summarized in Table 5, agreement was found within each outcome condition for subjects assigned to read George's case history. However, only Shirley subjects in the unfavorable and control conditions were found to give homogeneous ratings to the five items.

Table 5

Within Group Agreement on Item Rank Orderings by Case

Group	Shirley					George				
	<u>W*</u>	<u>χ^2</u>	<u>df</u>	<u>N</u>	<u>p</u>	<u>W*</u>	<u>χ^2</u>	<u>df</u>	<u>N</u>	<u>p</u>
Control	.26	20.52	4	20	< .05	.21	15.86	4	19	< .05
Favorable	.03	2.99	4	19	NS	.46	32.04	4	18	< .05
Unfavorable	.21	16.04	4	19	< .05	.19	15.10	4	20	< .05
Malpractice	.11	7.79	4	18	NS	.31	23.69	4	19	< .05

*Kendall's coefficient of concordance ranges from "0" (no agreement) to "1" (total agreement).

To examine whether the specific rank order assigned to each of the five items was influenced by the outcome information subjects had received, an analysis of group effects was conducted. Table 6 presents the results based on Kruskal Wallis' test. Although Kruskal Wallis' test uses the sum of the rank orderings to test group differences, Table 6 presents the mean rank ordering associated with each outcome condition to maintain consistency with the response units of the questionnaire item. Because the original rank orderings ranged from "1" (most preferred) to "5" (least preferred), higher means represent less subject preference. As seen in Table 6, the rank ordering of two of the five treatment plans was significantly different as a function of outcome condition, specifically, Dr. M.'s treatment recommendation, $\chi^2 (2, N = 153) = 28.94$, and the most conservative treatment alternative, $\chi^2 (2, N = 154) = 22.45$. Subjects in the unfavorable and malpractice conditions expressed less preference for Dr. M.'s treatment plan and more preference for the most conservative treatment plan than did subjects in either the favorable or control conditions. The case factor did not influence either the overall significance of these latter findings or the overall pattern of results.

Table 6

Rank Ordering of Two Treatment Plans as a Function of Outcome Condition*

	Control	Favorable	Unfavorable	Malpractice	χ^2	df	N	p
Dr. M.'s Treatment Plan	2.69	2.68	3.98	3.71	28.94	2	153	< .05
Most Conservative Treatment Plan	4.03	3.95	2.72	3.08	22.45	2	154	< .05

*Subjects rank ordered five treatment plans from "1" (most preferred) to "5" (least preferred).

Additional analyses were conducted with the goal of uncovering other potentially useful information about biased evaluations of an expert's judgment. After testing the original study hypotheses, it was thought that some of the supplemental evaluation items that were not significantly different across the four outcome conditions might differ as a function of another reclassification of subjects. Specifically, it seemed possible that subjects who evidenced the most hindsight bias relative to their peers might have assigned more blame to Dr. M., expressed more preference for gathering more patient information and for arranging for a professional consultation, and be less likely to perceive the case as difficult than other subjects who received unfavorable patient outcome information and than other subjects who received either favorable or no patient outcome information.

Operationally, this new subgroup of subjects, called the "hindsight group" was identified by their responses to the major dependent measures of the study, namely the three forced-sum prediction estimates and the overall evaluation index. Twenty-two subjects qualified as the "hindsight group." These subjects, who had all received unfavorable patient outcome information from either the unfavorable or malpractice condition, gave an average estimate of the three favorable patient-related outcomes that was more than one-half of a standard deviation (more than 10 percentage points) below the mean for all other subjects receiving the same unfavorable patient outcome. Further, these subjects gave an overall rating of Dr. M. that was more than one-half of a standard deviation (more than .45 units) below all other subjects who received the same unfavorable patient outcome information. Once identi-

fied by these criteria, these 22 subjects represented 13 men and 9 women. However, they disproportionately represented subjects assigned to George's case, $\chi^2 (2, N = 22) = 6.27$. Specifically, 73% of the hindsight group had been assigned to George's case. This result was not surprising given the recurring finding that George subjects in the unfavorable and malpractice conditions assigned lower probabilities to the major dependent prediction measures than did Shirley subjects in the unfavorable and malpractice conditions. The hindsight group (Group I in Tables 7 and 8) was compared with all other subjects who did not meet the above criteria, but who had also been assigned to the unfavorable or malpractice conditions (Group II in Tables 7 and 8), and with the remaining study subjects for whom hindsight bias was not applicable, namely those in the favorable or control conditions (Group III in Tables 7 and 8).

Univariate analyses of variance with each of the auxiliary evaluation items did not reveal significant mean differences in subjects' perceptions of the need for a professional consultation, for more patient information, or in perceptions of the overall case difficulty as a function of the new three-group reclassification. However, Table 7 shows that two results from the analyses of variance were significant as a function of the new classification.

Table 7

A Comparison of Supplemental Evaluations as a Function of Post Hoc Reclassification*

Evaluation Item	Group I	Group II	Group III	<u>N</u>	<u>F</u>	<u>df</u>	<u>p</u>
Percent Blame Assigned to Dr. M. for Unfavorable Patient Outcome**	66.6%	40.1%	59.0%	120	11.26	(2,117)	< .05
Agreement with Need for More Conservative Treatment	5.18	4.65	3.42	159	20.79	(2,156)	< .05

*The post hoc reclassification distinguished among students who received unfavorable outcome information and demonstrated the most hindsight bias on the principle dependent measures relative to their peers (Group I, N = 21-22), students who also received unfavorable outcome information but who did not fulfill the bias criteria for Group I (Group II, N = 55-58), and all other subjects who received either favorable or no patient outcome information (Group III, N = 76-80).

**The question of blame was not relevant to subjects who received favorable outcome information.

First, an overall group difference was found regarding the amount of blame assigned to Dr. M., $F(2,117)=11.26$. Interestingly, the largest mean difference occurred between the hindsight group and Group II subjects who also received unfavorable patient outcome information (66.66% versus 40.09%, respectively), and not between the hindsight group and Group III subjects who received either favorable or no patient outcome information (66.6% versus 59.1%, respectively). Second, Table 7 shows that the reclassified subgroups also differed in their level of agreement with the need for a more conservative treatment approach, $F(2,156)=20.79$. As seen in Table 7, there was a 1.76 unit difference between the hindsight group and the group of subjects who received opposite or no patient outcome. Of the three groups, the hindsight group agreed the most with the need for a most conservative approach. Although the pattern of results was different for the item on blame, the same two dependent measures were significantly different across the three-group classification as they were across the original four study conditions. Thus, the new classification supported rather than added to the information already discovered in the original analyses.

The rank ordering of treatment plans was also examined as a function of the three-group classification. Kendall coefficient of concordance was calculated to determine whether subjects within these three groups tended to rank order the five treatment plans similarly. Significant agreement was found within each of the three groups. The rank orderings of the five treatment plans were examined to determine if they varied as a function of the three group reclassification. As discovered with the four group comparison, the Kruskal Wallis test for the three

group comparison uncovered mean differences with the ranking of Dr. M.'s treatment plan, $\chi^2 (4, N = 153) = 37.12$, and of the most conservative treatment plan, $\chi^2 (4, N = 154) = 22.25$. (See Table 8.) However, in contrast to the four group comparison, a third mean rank was also found to differ among the three redefined subgroups. As seen in Table 8, there was an overall difference found with the ranking of the need for more patient information, $\chi^2 (4, N = 153) = 8.40$. The Group I subjects, the hindsight group, expressed more preference for gathering additional patient information than did both Group II subjects who also received unfavorable patient outcome information and Group III subjects who received favorable or no patient outcome information. Thus, subjects who evidenced the most hindsight bias were more likely than all other subjects to perceive a need for more patient information before making a definitive recommendation.

Table 8

A Comparison of Rank Ordered Treatment Plans as a Function of Post Hoc Reclassification*

	Group I	Group II	Group III	χ^2	df	<u>N</u>	p
Dr. M.'s Treatment Plan	4.54	3.56	2.68	37.16	4	153	< .05
Most Conservative Treatment Plan	2.68	2.98	3.99	22.25	4	154	< .05
Plan to Arrange for More Patient Information	1.95	3.07	2.78	8.40	4	153	< .05

*Subjects rank ordered five treatment plans from "1" (most preferred) to "5" (least preferred). The post hoc reclassification distinguished among students who received unfavorable outcome information and demonstrated the most hindsight bias on the principle dependent measures relative to their peers (Group I, N = 21-22), students who also received unfavorable outcome information but who did not fulfill the bias criteria for Group I (Group II, N = 55), and all other subjects who received either favorable or no patient outcome information (Group III, N = 76-77).

CHAPTER IV

DISCUSSION

Overview

The present study was designed to assess three new questions regarding the generality of hindsight bias: (1) do the predictive distortions associated with outcome information generalize to a context that includes a dissenting expert judgment? (2) does unfavorable outcome information bias evaluative judgment as it has been found to bias predictive judgment? (3) does mention of a malpractice suit exaggerate any predictive and evaluative distortions associated with outcome information? After discussing the results pertaining to each of these questions, the larger theoretical and applied implications of the present study will be explored.

Biased Predictive Judgment

Results of the present study provide consistent evidence that unfavorable outcome information biases subjective perceptions of predictive judgment. Across three prediction tasks, subjects who received unfavorable patient outcome information reported significantly less agreement with the expert than subjects who received either favorable or no patient outcome information. That is, when the outcome contradicted the expert judgment, subjects considered it comparatively unlikely that they would: (a) have made the same clinical assessment; (b) have recommended the same treatment; or (c) have anticipated a favorable patient response given the expert assessment and treatment solution.

These findings extend the domain of hindsight bias. The predictive distortions previously found as a function of outcome information were found to generalize to a context that includes a dissenting expert judgment. Prior research has consistently shown that outcome information biases people's impressions of their predictive capabilities (Fischhoff, 1975a, 1975b, 1977; Fischhoff & Beyth, 1975). In hindsight, people consistently overestimate what they would have foreseen without the benefit of hindsight. Although the implication that hindsight bias holds for the fairness of evaluating other decision-makers has been acknowledged (Fischhoff, 1975a, 1982a; Hogarth, 1980), this study provided the first direct test of the relationship between outcome information that contradicts a prior decision and subjects' assessments of their predictive judgment relative to the original decision-maker. Moreover, results showed that reporting an expert judgment that was inconsistent with the outcome did not undermine the power of outcome information to alter subjects' assessments of their predictive prowess. Subjects did not defer to the expert judgment. Rather, they reported a superior capacity to anticipate the likelihood of unfavorable events as compared to subjects who received either favorable or no outcome information. The influence of hindsight bias on subjects' assessments of their predictive capabilities was found across both forced-sum and open-ended probability measures, indicating that the hindsight effect in this context is not restricted to one type of response format.

Although the major hypotheses addressed the power of unfavorable outcome information to decrease predictive agreement, it was interesting to note that receiving confirmatory outcome information did not significantly increase predictive agreement as compared to receiving no outcome information. The data from the present study revealed no significant mean differences on any of the three prediction measures between subjects who received favorable outcome information and control subjects who received no outcome information. Both subject groups tended to agree with the expert predictions. Thus, in the absence of outcome information, subjects seemed to defer to the expert judgment.

Biased Evaluative Judgment

The domain of hindsight bias was further extended by examining the relationship between receiving outcome information that contradicted an expert judgment and subsequent evaluations of that expert. As hypothesized, the receipt of outcome information systematically biased subjects' average ratings of the expert as it did their assessments of their predictive capabilities. Subjects who received unfavorable outcome information not only presumed superior predictive capabilities as compared to the expert, but they evaluated Dr. M.'s clinical judgment more harshly than subjects who received either favorable or no patient outcome information.

These results extend evidence of hindsight bias from predictive to evaluative judgment. Subjects who received unfavorable outcome information tended to believe not only that they would have made different decisions than the expert, but that the expert should have made dif-

ferent decisions. As hypothesized, the expert was held accountable for not seeing possibilities that were only apparent to subjects in hindsight.

Secondary analyses were conducted to examine whether receiving favorable outcome information produced more favorable expert evaluations than not receiving outcome information. Unlike the comparisons of predictive agreement, significant mean differences were found in expert ratings between subjects in the favorable and control conditions. Specifically, subjects who received favorable outcome information were more impressed with Dr. M.'s judgment than subjects who did not receive any information about the patient's subsequent response to treatment. Thus, outcome information that seems to confirm an expert judgment does appear to increase the perceived favorableness of that judgment; and outcome information that contradicts an expert judgment appears to decrease the perceived favorableness of that judgment.

The Influence of Context

In addition to demonstrating that the hindsight bias phenomenon could be generalized to a context that included another person's judgment, it was of interest to test whether the predictive and evaluative distortions could be manipulated by another contextual factor. Specifically, it was hypothesized that mention of a pending malpractice suit would exaggerate the predictive and evaluative distortions associated with outcome information. This hypothesis was not supported by the data. Opposite differences than were hypothesized were found on two of the three prediction measures. Specifically, subjects who read of a malp-

ractice suit reported significantly more predictive agreement with the expert than subjects who read only of an unfavorable patient outcome. That is, overall, they considered it more likely that they would recommend the same treatment plan as Dr. M. and more likely that a favorable patient outcome would eventuate than did subjects who received unfavorable outcome information without any mention of a malpractice suit. In addition, the data analyses revealed an unanticipated gender by condition interaction for the outcome-specific prediction. Among the men, subject predictions did not vary as a function of the malpractice information. However, among the women, subjects in the malpractice condition reported more predictive agreement with the expert than did subjects in the unfavorable condition. Yet, no differences were found in the average rating of the quality of the expert judgment between subjects who received unfavorable patient outcome information and those who also received mention of a malpractice suit.

The fact that the subjects in the malpractice condition expressed more predictive agreement with the expert than other subjects who received unfavorable outcome information might reflect attitudes towards malpractice. Although mention of malpractice was intended to heighten the sense of gravity associated with the expert "error," it may have instead prompted certain feelings of compassion for the expert. A recent Newsweek article (Press, 1986) suggested that an awareness of the growing number of invalid malpractice claims has generated a new wave of support for physicians charged with malpractice. Students in the present study were perhaps more likely to side with the expert because of a similar attitude towards the inappropriate use of malpractice litiga-

tion. There is no apparent explanation for the influence of gender on this pattern of result.

In addition to this unanticipated context effect, the data provided some intriguing hints that the relative impact of unfavorable outcome information on predictive and evaluative judgment may depend on other characteristics of the situation. In addition to the malpractice effect discussed above, several analyses indicated an overall case effect. The case effect reflected the fact that Shirley subjects reported more predictive and evaluative agreement with the expert than George subjects. A closer examination of cell means revealed that the case differential was most pronounced among subjects who received unfavorable patient outcome information. Specifically, the unfavorable Shirley outcome generated more agreement with the expert than the unfavorable George outcome.

There are several factors that might account for the differential impact of these two cases. The case materials were different on a variety of dimensions including patient gender, age, family situation, and symptomatology. Although case effects were not found in the related study of outcome information and social explanation (Ross, Lepper, Strack, & Steinmetz, 1977), it is important to reiterate that Shirley's case was modified for use in the present study. Specifically, all mention of her violent thoughts toward her son were excluded after it was found to minimize the perceived credibility of her recovery among pilot subjects.

Although the case histories were very different, it seems more likely that the case effect was related to the case endings. The unfa-

avorable patient outcomes designed for Shirley and for George were intended to reflect different kinds of judgmental error. The case ending designed for Shirley was intended to illustrate a protocol error. Although Dr. M. recognized Shirley's emotional needs and recommended weekly psychotherapy, Dr. M. failed to refer Shirley to a physician as a routine precautionary check on possible physical pathology. In contrast, the unfavorable case ending written for George was intended to reflect a judgmental miscalculation of the extent of patient psychopathology; Dr. M. failed to prescribe the right amount of psychological help. The subjects who read of George's unfavorable response reported comparatively little predictive agreement or evaluative support of the expert. However, based on the comparatively supportive responses that Dr. M. received from Shirley subjects, it seems possible that subjects perceived Shirley's cerebral tumor to have represented a distinct problem outside of Dr. M.'s domain of responsibility. This interpretation is supported by the results of the analyses on subjects' forced-sum assignments of blame to Dr. M. and the patient. Shirley subjects in the unfavorable condition assigned significantly less blame to Dr. M. as compared to Shirley subjects in the other conditions.

There is no direct way to ascertain whether subjects discriminate between these two kinds of errors, whether the two kinds of errors were appropriately depicted, or whether the distinction is a meaningful one in terms of the hindsight effect on judgment. These issues furnish possible topics for future research. However, there was evidence in the present study to suggest that the unfavorable Shirley outcome was less salient than the unfavorable George outcome. As discussed earlier, 10

of the 12 subjects who failed the manipulation check were assigned to read the unfavorable ending for Shirley. Eight of these 10 subjects mistakenly reported that there was no outcome information included in the case history. It may be that these subjects, introductory psychology students fulfilling a course requirement, were particularly attuned to psychological issues and looking for psychological outcomes. Thus, they were more likely to miss the information regarding Shirley's cerebral tumor. This interpretation is consistent with prior research showing that people's schemas for thinking about a situation guide their attention to information and interpretation of that information (Fiske & Taylor, 1984). The many clues identified by these data clearly indicate that more research is needed to explore possible contextual effects that might mediate the predictive and evaluative distortions associated with unfavorable outcome information.

Variability Differences As A Function Of Outcome Information

The results of this present investigation revealed not only the mean differences described above, but they also uncovered significant variance differences as a function of outcome condition. Specifically, subjects who received unfavorable outcome information were more variable in their responses than subjects who received either favorable or no outcome information for the outcome-specific prediction and for the global evaluation measure. The same trend, although not reaching statistical significance, was apparent in the other two prediction measures. Although an unexpected pattern, this increased variability may represent another meaningful concomitant of the hindsight effect. It

may be that information of an expert judgment and of a contradictory outcome is not combined or interpreted in a uniform way for all people. If the effect is not an experimental artifact associated only with this study, it would be important to include measures of other potentially relevant cognitive factors to better interpret the increased variability. Research in person memory (Hastie & Kumar, 1979) and on social salience (Taylor & Fiske, 1978) has considered attention as crucial to the ways that people deal with inconsistent information. For example, Taylor and Fiske found that when someone in a group was made salient, subjects tended to see that person as causing whatever was happening. Further research should investigate whether the variability differences associated with outcome information replicate across other experimental contexts and, if so, whether these differences are mediated by various cognitive factors such as differential attention to inconsistent information.

Methodological Considerations

Before reviewing the theoretical significance of these findings in greater detail, several methodological considerations that influence the interpretation of these findings require mention. Several of these considerations pertain to the interpretation of the overall effect of outcome information on subject responses, while others pertain to issues of external validity. In all, they identify several directions for future research. First, although judgmental differences were found in the predicted direction as a function of outcome groups, it is possible that the overall influence of outcome information was mediated by a

recency effect. In all but the control condition, the last information that subjects received pertained to the patient response to treatment. There has been some evidence for recency effects in similar experimental tasks. For example, Arkkelin et al. (1979) found that the last information given to subjects was the most readily utilized information in a judgment task. Although recency effects have not consistently been found to influence judgmental responses (Frieze, 1976), it would strengthen the generalizability of these results to counter-balance the textual position of the outcome information.

The overall influence of outcome information on subjects' predictive and evaluative responses may also have been effected by the "concreteness" of the outcome information. Cognitive research has consistently demonstrated that concrete information, i.e., vivid information or information that described specific events, is more likely to be attended to and recalled than abstract information, i.e., summary or interpretive information (Hogarth, 1980). For example, Reyes, Thompson, and Bower (1980) reported that, in a mock jury decision task, subjects recalled more "vivid" than "pallid" evidence and that subjects' judgments of apparent guilt paralleled their differential recall. The outcome information for all conditions in the present study was certainly more concrete than much of the preceding case material. Although information concreteness is a potentially important factor, it again does not account for the between group differences.

Other methodological considerations pertain to external validity issues. It is perhaps difficult to identify circumstances in contemporary life that exactly parallel the experimental conditions in the pres-

ent study. In a review of recent decision-making studies, Ebbeson and Konecni (1980) expressed general concern about the external validity of decision-making research that relies on laboratory simulation of real world phenomena. In this instance, it is hard to imagine college students being asked to use a 3000 word case history to evaluate the clinical judgment of a psychologist. Two external validity issues are immediately apparent. First, there is the intuitively obvious difference in level of expertise. The use of process research, specifically, thinking-aloud protocols, has revealed that expert and novice clinicians employ different interpretations of patient data cues as well as qualitatively distinct "lines of reasoning" in reaching clinical judgments (Johnson, Hassebrock, Duran, & Moller, 1982). Carroll (1978, 1980) also reported results of expert-novice differences in the conceptualization of parole decisions. Nevertheless, although clinical psychologists are more appropriately trained than college students to render clinical judgments, there is evidence to show that they are not different than other experts or than college students in their susceptibility to hindsight bias (Arkes et al., 1981; Detmer et al., 1978) or to other cognitive biases in judgment (Casscells et al., 1978; Chapman & Chapman, 1982; Eddy, 1982; Oskamp, 1982). Thus, it is doubtful that the hindsight effects would be limited to the context of the present study for reasons pertaining to expert-novice differences.

One could even argue that the present design provided a more conservative test of the effect of outcome information on evaluations of others' decisions. College students might be more likely than expert clinicians to defer to an expert decision without an independent review

of the evidence. As discussed earlier, control subjects, who did not receive any outcome information, did not differ from the subjects who received favorable outcome information in their level of predictive agreement with the expert. Thus, in the absence of outcome information, subjects tended to agree with the expert predictions. In any case, it would be important in future research to vary the expertise of the subject populations to determine the generalizability of the results reported here.

The second limitation to external validity pertains to the anonymity of subject responses. Subjects in the present study were assured of the complete anonymity of their responses. Research has shown that subjects' private perceptions and their public judgments are not necessarily similar (Ross & Anderson, 1982). It is impossible to determine whether the responses from the present study represented subjects' public judgments, their private judgments, whether their private and public judgments are identical, or whether subjects even have a real opinion on the questions that they were asked. Shelley Taylor (1976) noted that in many experiments, subjects are presented with a lot of information and asked to answer a series of questions. In effect, the experimenter is asking: Now that you have put everything together, what do you conclude? Taylor noted that the more appropriate question might be: How are you putting this information together and do you have any conclusions? In the present study, it is possible that subjects did not feel equipped to make patient-related predictions or to evaluate the expert. However, behaving as most study subjects (Carroll, 1980), they answered the questions anyway. In terms of external validity, the concern here has less

to do with whether subjects had the appropriate information or training to make the judgments as compared to clinical psychologists. There are certainly countless experiences in contemporary life that one can point to where individuals make decisions or volunteer opinions based on insufficient information. The concern here has more to do with whether subjects' were reporting their considered opinions on the topics. Although resolution of this issue is not required for discussion of the between group differences, it does point to the need for process research to explore how hindsightful predictions and evaluations are made.

The Objectivity of Second-Guessing

Theoretical Significance

The present results provide important new evidence of hindsight bias. Most importantly, these results generalize evidence of hindsight bias to the process of second-guessing the decisions of other people. Specifically, these results demonstrate that the predictive distortions associated with outcome information generalize to a context that includes another person's judgment. Further, these results demonstrated that evaluative distortions result as a function of outcome information. Secondary analyses revealed that outcome information did not have a consistent influence on all evaluative questions. Of the nine auxiliary evaluation items, only two were significantly different as a function of outcome information. Further, a reclassification of subjects based on the relative amount of predictive and evaluative distortions apparent in their responses did substantially change the overall pattern of results.

Taken together, these findings expand our knowledge of hindsight bias. They may also have relevance to the "fundamental attributional error" (Ross, 1977), which refers to people's tendency to underestimate the situational constraints on others' behavior. For instance, the discounting of situational constraints was powerfully demonstrated in an experiment conducted by Ross, Amabile, and Steinmetz (1977). In a simulated quiz game, both the contestants and observers of the experiment believed that the questioners really were more knowledgeable than the contestants even though everyone was fully aware that the questioner and contestant roles were randomly assigned. Jones and Nisbett (1971) suggested that the tendency to underestimate situational factors when explaining others' behavior results from the fact that observers and actors have different perspectives. When observing, the person occupies the center of attention; when acting, the environment commands our attention.

Perhaps the results of the present study reflect a specific instance of a more general tendency to underestimate situational factors when making inferences about other people. In this instance, hindsight subjects seem to discount the situational uncertainty that the original decision-maker faced. More research is needed to determine whether or not the tendency to underestimate situational uncertainty is a principal factor in the predictive and evaluative distortions found in hindsightful evaluations of others' judgment. Discovering the specific cognitive factors that cause the bias is critical to understanding many of the practical implications of hindsight bias.

Applied Implications

It is likely that we have all questioned a decision made by someone else, particularly when things turned out badly as a result of that decision. The recent Challenger tragedy has opened up the entire NASA organization to the hindsightful evaluations of a nation. Although the conventional focus in second-guessing is on the fallibility of their judgment, results of the present study suggest that our inferences about their judgment are themselves suspect. Once informed of an unfavorable outcome, we tend to believe that we would have made a different decision and that the original decision-maker should have made a different decision. These inferences do not result from our independent and careful review of the same evidence that the original decision-maker reviewed; rather, they result from "that special wisdom born of hindsight." (Fischhoff, 1975b)

Because of its grave practical importance, much research has been directed at exploring various strategies to remove predictable cognitive biases in judgment. Some of the research has investigated ways of training people to overcome cognitive biases (e.g., Carroll & Siegler, 1977; Fischhoff, 1982b; Fischhoff, Slovic, & Lichtenstein, 1979; Gaeth & Shanteau, 1984; Hogarth, 1980; Lichtenstein & Fischhoff, 1980; Nisbett & Ross, 1980; Pitz & Sachs, 1984; Zechmeister, Rusch, & Markell, in press). Other research has been directed at changing the structure of decision tasks as a way of eliminating or reducing cognitive bias (e.g., Hogarth, 1980; Miner, 1984; Rose, Menasco, & Curry, 1982). Prior research on hindsight bias has already provided some meaningful clues for reducing the bias introduced by outcome information. Specifically,

having subjects generate explanations for alternative outcomes has successfully eliminated the predictive distortions associated with hindsight (Ross et al., 1977). Although it has not been demonstrated in an experimental context, Fischhoff (1975b) proposed that the best way to overcome the bias in hindsightful evaluations would be to invite only people blind to the outcome to review an uncertain situation and the viability of various decisions. Results from the present study strongly suggest that cognitive or task interventions are needed to assure the objectivity of hindsightful evaluations.

Taken together, these results have critical implications for numerous circumstances in contemporary life that rely on hindsightful evaluations to assess people's judgment. It is clear from these findings that undetected hindsight bias undermines the objectivity of those evaluations. When an unfortunate event occurs, what is needed is not a biased investigation of another's judgment; rather, what is needed and fair to all concerned is an unbiased investigation of another's judgment.

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APPENDIX A

EXPERIMENT SUCCESS**Instructions**

THIS IS A VERY IMPORTANT STUDY INVOLVING CLINICAL JUDGMENT. WE NEED TO KNOW HOW PEOPLE LIKE YOURSELF JUDGE CERTAIN CLINICAL SITUATIONS. You are being asked to read a case history such as it appears in an authentic clinical case textbook. At the time the case was first documented, the treatment recommendation and the outcome were not reported.

As you're reading, pay attention to information about the patient's background, formative experiences, and symptoms that might help predict later events in the patient's life. Clinical judgment has much to do with explaining past events and correctly anticipating future events while avoiding the pitfalls of either overinterpreting or neglecting relevant case material. Although you are not trained as a clinician, we are interested in your judgments regarding this case.

Once you've finished reading the case, please answer the questions that follow. Raise your hand if you need any clarification with the questions.

Any clinical case material is very sensitive. Therefore, it is most important that you not discuss this case or the study questions with anyone either during or after your participation. Thank you for your cooperation.

APPENDIX B

SHIRLEY K.

Clinical Case History

Shirley K., a twenty-three-year-old housewife, came to the Mental Health Clinic with a complaint of frequent attacks of headaches and dizziness. After describing these symptoms, Shirley added that she had other problems, mainly with her marriage. She had always considered herself sexually responsive to her husband, but lately, she had noticed a considerable decrease in her sexual drive; frequently she had not been able to achieve orgasm. Worse still, Shirley was beginning to find her husband's advances repugnant. Instead of finding satisfaction in their relations, Shirley was resorting to masturbation; during these times she achieved orgasm while fantasizing violent sexual attack by men. Usually these were men of a physical type she had not before found attractive.

Shirley, a petite and attractive brunette, was dressed simply and in excellent taste. Her young and naturally pretty features were noticeably marred by her evident facial tension. Her manner would change depending on what she was talking about. For instance, she appeared quite detached when she related the early events in her life; her tone was monotonous, and at times the interviewer had difficulty ascertaining if Shirley was discussing her own problems or those of a stranger, even when she recalled some particularly traumatic events.

Current Life Situation. Shirley and her husband, Bill, had been married for almost two years. This was Shirley's second marriage and Bill's first. They had recently undergone some serious crises. Bill had just started his third job in four years, as a lawyer in a large manufacturing concern. He had lost his last job three months before because he was "overly ambitious." Shirley had been very upset when Bill was fired; she had started to wonder if he would ever straighten out and provide for the family. Shirley claimed that for once she would like to have a man who would take care of her. Although she had never been aware of wanting much in the way of material possessions, recently she had begun to have ambitions for a higher standard of living. For example, she wanted to move into a better neighborhood, where Saul, her two-year old son, could have "nicer friends." She found herself restricting Saul's playmates for various reasons, but this proved particularly upsetting since it repeated a pattern of her own childhood. Shirley found it virtually impossible to ask Bill for anything, and when she did bring herself to ask for anything, either for herself, Saul, or the house, she became so guilty that occasionally she ended up returning the items to the store.

Past History. Shirley grew up in a lower-class neighborhood of a medium-size city. She was an only child, and her parents were economically better off than their neighbors. Her father worked as a railroad engineer and made an ade-

quate lower-middle-class income. Shirley's parents impressed upon her that they regarded themselves socially above the rest of the neighborhood, and they controlled her playmates very rigidly. Thus, Shirley spent many days in an enforced isolation while the other children played on the streets. She described her father as a "good guy" who spent a good deal of time with her. However, he was also quite strict and demanded a high standard of behavior from her. Shirley received an occasional spanking from her father, but on the whole he was passive, and he left the actual disciplining to his wife. Her mother attempted to control her by constantly screaming at her, which Shirley found intolerable. She recognized that her parents were concerned with her welfare although they found it difficult to be openly affectionate. Shirley's mother was preoccupied with illness; she would become "ill" whenever the pressures of family life became too great. These illnesses, largely hypochondriacal, brought support and sympathy from both Shirley and her father, and they were her mother's most effective means of controlling the family. During the periods of her mother's "illnesses" it became Shirley's duty to take over the responsibility of the home. Her mother unabashedly criticized Shirley's performance. Although often very annoyed with her mother's illnesses, Shirley kept her irritation to herself, believing that there was no alternative to this state of affairs.

Shirley's early physical and social development was essentially normal. When the restrictiveness of her parents seriously limited her friendships, she made up fantasy playmates to while away the time. At the age of six Shirley started in a grade school which was composed of students from lower-class homes. Shirley regarded the other students as much rougher than herself, and found much of their behavior difficult to reconcile with the standards of conduct set in her home. During her school days, Shirley's parents continued their policy of keeping her apart from the "bad" children of her neighborhood. Though frustrated and lonely, Shirley never felt that it was a matter which she could discuss with her parents.

As she approached puberty, Shirley's father in particular tended to restrict her contact with boys very vigorously. Initially, as she entered her teens, she was not permitted to associate with boys or to be away from home after dark. There were numerous indirect warnings about the dangers of sex, but she received little or no sex instruction. Shirley entered high school at fourteen and found herself at a loss in an essentially upper-middle-class school. Her clothes were inferior to those of the other children, and their poise and snobbish ways made her feel extremely uncomfortable. At this time, against her parents' wishes, she transferred to a vocational school, where she felt much more at ease. However, the expressed antisocial behavior of many

of the children shocked her. Some of the boys already had police records, and the girls were not ashamed of recounting their sexual adventures. It was at this time that Shirley began to date. Her father bitterly opposed this; it was only after a violent fight that permission was granted to be out until ten at night. During this period, Shirley met Don, who was her age. One evening, after a few dates, Don induced her into having sexual relations, using, as Shirley described it, "considerable force" to get his way. However, Shirley described the experience in rather bland terms, suggesting that she found the experience neither pleasurable nor unpleasurable. She also did not remember experiencing any guilt over this incident, but she did have a fear of social disapproval should the other kids find out. Shirley and Don continued to have sexual relations for the following two months, during which she submitted without pleasure to Don's demands. Then Don became interested in another girl and their relationship gradually dissolved. She remembers feeling relieved at the end of this affair. After the break-up with Don, Shirley continued to date boys, but she avoided intercourse. She was interested in kissing and petting, but was at a loss on how to communicate this to boys in a respectable fashion. She finally hit on the solution of pretending to be asleep when alone with a boy. During these periods she would permit the boy to make advances, waking up when the advances went beyond what she desired.

Conflict and discord within the home remained intense during this period, and Shirley often had to fight with her father in order to obtain permission to go out on a date. Frequently she had to endure physical punishment from her father before he would relent and finally let her go. It was during this period that Shirley met Al, a man in his late twenties. Shirley was sixteen at the time and found Al quite attractive. After a brief courtship which involved some aborted sexual experiences, Al asked Shirley to marry him. Although aware that she was not completely in love with Al, Shirley found his proposal desirable as it would get her out of her oppressive home environment. They were married three months later with her parent's approval. Shirley described Al as a "nice guy" who took care of her and was kind of fatherly toward her. At the beginning, she found sexual relations gratifying, but gradually she lost interest and became frigid. In many ways, Shirley's description of Al was very vague, and further questioning produced little additional information.

After a few months of marriage, Shirley found herself growing more distant from Al, and she began to look around for other interests. She signed up for a course in music appreciation given by a local musician of some repute. She found herself very much attracted to the teacher, James, and within a short time they were involved in an affair. When she was eighteen Shirley divorced her husband and went to

live with James. To help supplement the meager income James derived from his music appreciation courses, Shirley successfully operated a small record and sheet music store. She found James was a very bohemian type who cared little for material things and gradually left the financial support of the relationship up to Shirley. Shirley's relationship with James was a very tempestuous one. In addition to working infrequently, James conducted a number of affairs with other women, often flaunting them in front of Shirley. Shirley reported that she was jealous to a mild degree, but also, she felt more desirous of James and more interested in him because other women were. At times, Shirley threatened to leave James and he usually replied with an unconcerned "OK goodby." When this happened, Shirley became terribly upset and she would beg James to take her back. Throughout the affair, Shirley felt an intense sexual attraction for James and not once did she experience the loss of desire or the frigidity characteristic of the situation with her first husband. James constantly emphasized his inability to support her and his lack of desire to conform to society whenever Shirley raised the issue of marriage.

It was during the affair with James that Shirley's father became seriously ill. She received a telegram from a relative asking her to return to her home town; but she did not want to go because she was having considerable difficulties with James at that time. Her father died shortly after-

wards, and Shirley felt intense guilt because she failed to see her father before his death. Shortly after her father died, Shirley's mother became emotionally ill. She was going through the menopause and developed acute involuntional symptoms. Shirley went back to her home town and found it necessary to have her mother committed to a state hospital for treatment. Again Shirley experienced intense guilt feelings about taking this action, particularly since she left her mother in the hospital shortly after commitment in order to return to James. Shirley's mother remained in the state hospital for one year at which time she was discharged as improved.

During the latter phase of her affair with James, Shirley tried several times to leave him, but eventually realized that it was impossible. She was amazed to see how intensely she was bound to James. At times, she felt that he could do anything to her, regardless of how cruel or humiliating, and she would endure it without complaint. At one point, James expressed a desire to have a child and shortly thereafter Shirley became pregnant. During this pregnancy, Shirley was often ill, suffering frequent bouts of nausea and headaches. James worked very little and Shirley continued to work part-time in the afternoons. She often longed to stay home in the mornings to rest, but James insisted that she should get away from the house. During the pregnancy Shirley found it possible to make some demands on James. One morning,

Shirley and James had a particularly violent argument in which Shirley was annoyed that James wouldn't help her clean the house. She was particularly determined that James should clean the attic. Shortly after their argument, when Shirley got into the car to leave for work, James kissed her goodbye and said, "Don't be angry with me." When Shirley returned home she found James dead, hanging from a rafter in an immaculately clean attic. Shirley was shocked, but recovered in a few hours without any visible disruption in her behavior. She called the police, and made arrangements for the funeral. Shirley was very surprised at her reaction to the whole affair. Although she had lived with James for three years, she believes that she must have been secretly relieved that the relationship came to an end. She found herself strangely unable to cry or to experience any emotion after James's death; however, at the funeral, she found it necessary to feign a grief reaction so that her friends would not think her peculiar. Shirley's behavior after James's death was so well controlled that her friends continuously praised her "for carrying on without going to pieces." Shortly after the funeral, Shirley left the city to return to her home town, where she moved in with her mother.

Six months later, Saul was born following a normal and easy delivery. Two months after Saul was born, Shirley went to work as a secretary at the large factory where she met

her present husband. Their courtship was a stormy one but they decided to get married after six months of an on-again, off-again, engagement. Bill seemed to take to Saul very early in the relationship and was pleased with the idea of having a ready-made family. At the time treatment began the couple were trying to have a child of their own, but had not succeeded.

Treatment Recommendation. As was customary in the clinic, Shirley was assigned to a clinical psychologist whose job it was to make a judgment about Shirley's emotional condition and to make a treatment recommendation based on that judgment. Dr. M. met with Shirley wherein the preceding information regarding her background, formative experiences, and current complaints was discussed. Dr. M. judged Shirley's physical symptoms, the headaches and dizziness, to be caused by emotional issues. Like her mother, it seemed that Shirley had learned to develop physical symptoms as a response to emotional problems. Dr. M. recommended that Shirley begin weekly outpatient psychotherapy immediately to work on her emotional issues.

GEORGE P.

Clinical Case History

George P., a single, white male, age fifty, had requested readmission to a Veteran's Administration general and surgical hospital, "Because my stomach had been acting up again." On admission, George had given a detailed description of his complaint, using many medical terms with which he had become familiar in his previous hospitalizations. At this time his disability had become so severe that he had been unable to work for the previous three months. Almost constantly during his waking hours he was aware of pains in his stomach, a steady "heartburn," and a generalized feeling of weakness and malaise. He was unable to eat any solid food comfortably without fear of vomiting. For the past several weeks he had lived chiefly on skimmed milk. During this time he had lost the fifteen-pound weight gain which he had accumulated over the year since his last hospitalization.

In appearance Mr. P was a slight-built man, five feet, four inches tall, hollow-cheeked but bronzed in complexion. He walked jauntily around the hospital, sat relaxed in a chair as he talked, and seemed in general good spirits; in fact, at first glance, with the exception of his notable thinness of face, he appeared to be in the best of health. Indeed, although he said he was somewhat depressed by having to return to the hospital, he seemed most cheerful. He was quite friendly, although he admitted that he didn't see any connection between his physical illness and any possible

"nervousness" and was merely being co-operative because his physician had recommended it. He himself felt sure that "nervousness" would be ruled out as a cause of his illness and that he would be continued on a regime of medication, with the possibility of surgery, as had been the case in his previous contacts with the hospital.

Usually wearing a hospital robe, even though not confined to bed, he was always neatly attired. His thinning, dark hair was plastered down against his skull and the nurses reported that he spent a great deal of time in his personal care and grooming. When not wearing his hospital robe he dressed in his working khakis and sported a bright-colored necktie and highly polished shoes.

This was the sixth readmission to this hospital for George. He had first been admitted in 1947 shortly after his discharge from the military service, with the same complaint. He was admitted the second time ten years later and he had been readmitted annually since 1957 with the exception of one year. A stomach ulcer had been discovered on his second admission in 1957, and in 1958 he had a resection of the stomach wall. Since that time he had been treated by various medications but there had been no signs of an active ulcer in the last several hospital admissions.

At the time of this hospitalization George was living alone in a tiny one-room apartment near the hospital, as he had been since his mother's death in 1956. He had been

employed steadily for the past three years as a serviceman for an automatic food machine company, refilling the coffee and other food machines in various business establishments and institutions in the local region. George went into detail in explaining his job and some of the difficulties involved. He had obtained the job through a friend who owned the company when it opened. He was the company's most experienced worker, having outlasted all other men who had worked for them. In his opinion, other men quit because the work was fairly demanding, keeping a person on his feet all day long and on the move, going from building to building. Not only was he responsible for seeing that the machines were stocked but also that they were in good repair; in addition he had to collect the receipts and make sure that the machine was full of change. He had to answer the complaints of the customers and was on call whenever a machine broke down. He was also charged with trying to sell the machine service to new firms throughout his area. His work was salaried, but he made extra commissions whenever he sold the service to a new firm. He found the work challenging, was proud of his service, and had made many friends by his cheerful and co-operative manner. He claimed that his customers were all very fond of him, called him by his first name, and looked forward to his visits. He boasted that he had expanded the firm's business in his area some ten times in his period of employment by the company. According to

George his job occupied approximately ten hours a day, but he didn't mind because he had very little else to do and the job afforded him a great deal of social contact, which he lacked elsewhere. However, shortly after he joined the company his friend was stricken with a heart attack and a young relative of the friend took over the company. He felt that this new employer was letting the business deteriorate through disinterest and that George's own efforts to build up the business in his particular area were unappreciated. At times George felt that his new young employer actually did not want to see the business expanded and interfered with some of George's efforts to see new business built up. During George's previous periods of illness his employer had been most understanding and had not docked his pay although there was no definite sick leave provision on his job. However, during the past year George's employer was much less sympathetic with his occasional illness. George felt he had to struggle even harder to be there every day as there was not a replacement for him and his customers were becoming dissatisfied. Thus he often went to work when he was feeling quite ill and struggled through the day. He found the lifting of heavy boxes of supplies and the pushing around of large food-vending machines becoming almost impossible. He finally asked for a two-week vacation, which he had coming to him but which ordinarily he would have taken in midsummer rather than at this time, just after Christmas.

His employer refused him the vacation, whereupon George suddenly resigned in a fit of anger. For the following six weeks' pay period he stayed home, living at first on his severance pay and then on unemployment insurance. The week before his unemployment insurance ran out George applied for admission to the hospital.

Past History. George was the fourth of five children born in a small, Midwestern town to a veterinarian and his schoolteacher wife. His older brother and two sisters were respectively fifteen, twelve, and ten years older than himself, and his younger brother was one year his junior. George spoke in glowing terms of his father. He initially described him as a very kindly man whom everyone loved and admired. His extensive veterinarian practice left him little time for his family. As a mark of his father's prowess, George told how his father had been one of the first to utilize artificial insemination with cattle and was in George's words "the father of 5000 cows in southern Ohio." George claimed that "kindness and service to others" was the principle of his own life, which he had learned from watching his father's work with animals. He described his father as a silent person who, in his firm and yet kindly manner, was able to subdue and win over the most recalcitrant or vicious animal. He remarked that his father probably regarded animals as more intelligent and as having more feeling than people, and indicated indirectly that his father was fairly impatient with human stupidity.

Another "virtue" that George claimed to have learned in his childhood was "hard work." From school age on he was responsible for many of the chores around their small farm, particularly as both his parents were employed and his older brothers and sisters were already grown and had left the family. George denied that he resented having to spend most of his after-school hours at these chores, saying he often wished he were back on the farm. He spoke with considerable nostalgia of his childhood years, particularly of the rewards of outdoor life and of "good, fresh farm food." He emphasized that although his mother taught school, she was always at home to take care of the house and to provide generous meals for the family and to entertain many friends. He spoke longingly of homemade butter, pork chops for breakfast, and his mother's baked goods. He learned to cook from his mother and enjoyed helping her around the kitchen. He volunteered that despite all of this good, rich food he never gained any weight and was always of slight build, and wiry. His lean build concerned his mother a great deal and she was always anxious to fatten him up. However, he said, he was built much like his father and up until the time of his illness had always been able to eat everything and anything without fear of becoming overweight.

George was a slightly above-average student throughout his primary-school years, when he was constantly coached by his mother. He admitted readily that this coaching by his

schoolteacher-mother was a point of irritation to him, although he quickly added that this was the only thing he could think of about which he had actually been at odds with her. Apparently he was able to convince his mother when he began high school that he should be free of her teachings, but he was much less successful a student in high school, where he was much more interested in sports. Despite his size he had been an active athlete, was always on the baseball team, and even played basketball until he reached an age when he did not have the required height. He had many companions and despite his home duties and extra studies he had plenty of time to play and to get into mischief. He admitted with a laugh that he often embarrassed his parents by his mischievous and somewhat destructive acts - which he thought all young boys did. Occasionally, his mischief brought him to the attention of the town constable, who took a special delight in hunting him down because he was the schoolteacher's son. His parents attempted to discipline him, chiefly by adding to his chores and attempting to restrict him to the confines of the family property. Occasionally his father administered the traditional corporal punishment in the woodshed. He described himself as being "a young rebel" during his teen-age years, who "gave the teachers a bad time at school." Approximately three months prior to the time he would have been graduated from high school he was called to the principal's office for

infraction of one of the school rules, at which time, in a peak of anger, he threw his locker key on the principal's desk and demanded his twenty-five cents' deposit as an indication that he was quitting school. When he announced this decision later that evening to his parents, his father's response was that if he were old enough to make such a decision he was old enough to earn his own living and from there on his father would require room and board money from him.

George decided angrily to leave home. After a tearful scene with his mother he packed his bags and took the next freight train out of town. This was the first year of the depression of the 1930's and George found it difficult to find permanent employment anywhere. He roamed back and forth across the United States, often living in hobo jungles, picking up work where he could or living temporarily off of various kinds of relief from government agencies. Despite the many deprivations which he endured then, George talked about this period of his life as if it were actually enjoyable. When unemployed, he would go sightseeing, talk to people from every walk of life, and live a life of general freedom even though he no longer enjoyed the relative luxury he had been used to in his childhood. Some three years later, when he was approximately twenty-one, he returned home for a brief visit to find his father on the verge of death. His father had suffered from an undiagnosed

stomach problem. Some months before George's return home the elder Mr. P had been told he had stomach cancer, whereupon he suddenly dropped his entire practice and sat around home in what must have been a deep depression. George was shocked to find his father so depressed and urged him to seek medical care, but the father adamantly refused, saying that he did not trust doctors. Finally the family almost forced the elder Mr. P. into the hospital, where over his protests he underwent surgery. Shortly thereafter George's father died from pneumonia.

After the death of his father, George attempted to operate the family farm for a short period. His older siblings were married and had families of their own and could not, at that point, contribute to his mother's support. His younger brother had gone on to college and was beginning a career in the theater in New York. After approximately a year, George convinced his mother to sell the family property. Then they moved to Southern California, where George had spent some time during his travels around the country. Until World War II, George earned his living at various odd jobs, chiefly as a short-order cook and baker. He was drafted into the navy in 1942 and served for four years as a cook and baker. He was aboard ship a great deal of the time but saw no combat other than the constant strain of possible submarine warfare or occasional threat of air attack. He claims to have been

deafened at one time by gunnery practice and was given a 10 per cent disability for hearing loss. After his discharge from the service in 1946, he returned again to live with his mother. Using some of the veteran's benefits, he borrowed money and went into the restaurant business. He operated two different restaurants and bars over the next five years, both of which failed. He explained that he had misfortune in the first such venture when the partner ran off with the funds. In the second venture, he foresaw the approaching depression of the mid 1950's and sold out because he was afraid of losing funds which he had borrowed from his mother. Although George never mentioned his inheritance directly, it appeared that his father's estate had been left under the control of his mother, who bought a home and was able to live on the income from investments whether or not George himself brought in any income.

George described his twenty years of living with his mother as almost idyllic. "She was my buddy." He spent all his spare time sure that she was comfortable, that she got where she wanted to go, and that she had all the comforts of home. He described in detail the flower and vegetable garden that he worked on year after year for her satisfaction. He was an avid fisherman and outdoor sportsman and he always took his mother along. He had a special "camper" built for her comfort and always brought back his fishing catch for her approval.

Despite his portrayal of himself as a good boy devoted to his mother, George gave many hints that his adult social adjustment was at times marginal. He admitted that he was in frequent trouble with the law because of his driving habits. He had numerous tickets for speeding, for driving under the influence of alcohol, and later, when his license was taken away, for driving without a license. He bemoaned the rising costs of fines for his illegal driving practices. Although he said that he had lost his business because of the depression, VA records indicated that he also had been in trouble for selling liquor to a minor. He later admitted that his business partner was a gambler and that he himself had tried to make money through gambling at various times.

When asked about his use of alcohol, George became tight-lipped and somewhat irritated, saying that he had better admit that he drank at least a six-pack of beer a day because this was already in his record. He explained that he had been in an altercation with a night nurse just the previous evening because she had suggested that he might go to an Alcoholics Anonymous meeting; he felt that it was unfair that he had any reputation as an alcoholic. On the other hand, in discussing his mother, he admitted that the one thing she would never do was open a can of beer for him. He strongly denied that he drank anything stronger than beer, but then added with a smile that this was because he couldn't afford it.

In discussing his family, George repeatedly mentioned the successes of his younger brother David. He described how his brother had become a major theatrical producer, with frequent plays on Broadway and productions in Los Angeles, and more recently in Las Vegas. He remarked how extremely proud his mother was of David and how David would send her theater tickets and a plane ticket to go to the opening nights of his new productions. George admitted that he himself had seen only one or two of David's plays. He admitted with a wink that when his mother was away from home he was able to get in a little extra fishing or drinking which she might otherwise not approved of. He also described David's success as particularly amazing because, "frankly, David was a sniveling little brat" as a child, whom no one presumed would ever amount to anything. As he looked back on it, George remembered that when they were children David spent most of his time with books instead of sharing the farm chores with George.

Asked why he had never married, George laughed and said he had always asked that question. He decided that he had been left with the responsibility for his mother and that life had been so easy and wonderful with her that he had never gotten around to hunting for a wife. He went on to reflect that he had been so interested in sports as a youngster in high school that he did very little dating. He had had one girl he was very fond of, but always had to struggle

with several other rivals. He recalled an incident in which he had lost his temper and beaten up a rival for this girl, and subsequently the girl's father had forbidden him to come around the house because of this. The girl married another man and many years later George heard that her husband had died. On hearing this, he made a trip back to his home town to visit her. He described her with considerable disgust, saying that she had grown obese and sloppy and "was wearing nothing but a thin dress." Asked more about his sexual adjustment, George shrugged and said that he guessed he was about normal for a bachelor, explaining that he visited houses of prostitution once or twice a year "to get it out of his system."

George's mother died in 1956. Although he was able to discuss the details of her death and his feelings about it in the same garrulous fashion he had discussed other facets of his life, there was a noticeable lowering and depression in his voice and his eyes seemed near to tears once or twice. He overtly denied being depressed, saying that it was fortunate that she had lingered on for a long period because he had that way been able to get used to the idea that she was going to die. He explained that she had been an extremely active and independent person until the time of accident which led to her death, even though she was approaching eighty. She had been shopping by herself, had slipped, fallen, and broken her hip. She was hospitalized

for many months and returned home, where he had to nurse her. Shortly thereafter she suffered an embolism which left her paralyzed and necessitated putting her in a nursing home. His mother continued to "fight off death" for another six months while she lay paralyzed and almost unconscious. George had quit his job as a cook at the time of her injury and had stayed at home caring for her, living off the income of some of her investments. For the following year he continued to be unemployed. After his second hospitalization in 1957 for his stomach complaint, he went back to work as a baker. After his 1958 operation he obtained his present job.

Treatment Recommendation. George's current physical examination and laboratory reports showed that although he had some hyperacidity in his digestive system, George was not in any physical danger nor did he have any physically disabling problems.

George was referred to a clinical psychologist whose job it was to make a judgement about George's emotional condition and to make a treatment recommendation based on that judgment. Dr. M. met with George wherein the preceding information regarding his background, formative experiences, and current complaints was discussed. It was Dr. M.'s judgment that, as long as George no longer needed medical attention, he should be discharged from the hospital. Dr. M. thought that George's repeated hospitalizations reflected

his desire to be sheltered from the adult world. Although George still sought refuge in the hospital, Dr. M. felt that George was emotionally capable of leaving the hospital and beginning to live on his own at this time. Dr. M. recommended that George see a vocational counselor to be placed immediately in a suitable job. Dr. M. also recommended that George begin weekly outpatient counseling to help George adjust to leaving the hospital and functioning in society.

APPENDIX C

Shirley Subjects

THERE ARE NO RIGHT OR WRONG ANSWERS TO ANY OF THESE QUESTIONS.

WE ARE INTERESTED IN YOUR OPINIONS REGARDING THIS CASE.

FOR QUESTIONS 1-5, PLEASE CIRCLE ONE NUMBER BETWEEN 1 and 6.

1. Based on this case, how would you rate the quality of Dr. M.'s overall clinical judgment?

VERY		SLIGHTLY	SLIGHTLY		VERY
POOR	POOR	POOR	GOOD	GOOD	GOOD
JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT
1	2	3	4	5	6

2. More specifically, how would you rate Dr. M.'s judgment that Shirley's physical symptoms were caused by emotional issues?

VERY		SLIGHTLY	SLIGHTLY		VERY
POOR	POOR	POOR	GOOD	GOOD	GOOD
JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT
1	2	3	4	5	6

3. How would you rate Dr. M.'s treatment recommendation, specifically that Shirley begin weekly outpatient psychotherapy to work on her emotional issues?

VERY		SLIGHTLY	SLIGHTLY		VERY
POOR	POOR	POOR	GOOD	GOOD	GOOD
1	2	3	4	5	6

4A. Assume that Shirley follows Dr. M.'s treatment recommendation and she recovers. How much credit would you say Shirley deserves for her recovery?

NONE	A LITTLE	SOME	MUCH	MOST	ALL
OF THE	OF THE	OF THE	OF THE	OF THE	OF THE
CREDIT	CREDIT	CREDIT	CREDIT	CREDIT	CREDIT
1	2	3	4	5	6

4B. Assume that Shirley follows Dr. M.'s treatment recommendation and she recovers. How much credit would you say Dr. M. deserves for Shirley's recovery?

NONE	A LITTLE	SOME	MUCH	MOST	ALL
OF THE	OF THE	OF THE	OF THE	OF THE	OF THE
CREDIT	CREDIT	CREDIT	CREDIT	CREDIT	CREDIT
1	2	3	4	5	6

4C. Assume that Shirley follows Dr. H.'s treatment recommendation and she recovers. Assume that 100% of the credit must be assigned to Shirley, Dr. H., or some combination of the two. Use percentages below to assign credit for Shirley's recovery.

NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

Shirley deserves _____ % of the total credit.

Dr. H. deserves _____ % of the total credit.

TOTAL 100 %

5A. Assume that Shirley follows Dr. W.'s treatment recommendation and she suffers certain consequences for not seeking medical attention right away for her physical symptoms. How much blame would Shirley deserve for those consequences?

NONE	A LITTLE	SOME	MUCH	MOST	ALL
OF THE	OF THE	OF THE	OF THE	OF THE	OF THE
BLAME	BLAME	BLAME	BLAME	BLAME	BLAME
1	2	3	4	5	6

5B. Assume that Shirley follows Dr. W.'s treatment recommendation and she suffers certain consequences for not seeking medical attention right away for her physical symptoms. How much blame would Dr. W. deserve for those consequences?

NONE	A LITTLE	SOME	MUCH	MOST	ALL
OF THE	OF THE	OF THE	OF THE	OF THE	OF THE
BLAME	BLAME	BLAME	BLAME	BLAME	BLAME
1	2	3	4	5	6

5C. Assume that Shirley follows Dr. M.'s treatment recommendation and she suffers certain consequences for not seeking medical attention right away for her physical symptoms. Assume that 100% of the blame must be assigned to Shirley, Dr. M., or some combination of the two. Use percentages below to assign blame for those consequences for Shirley.

NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

Shirley deserves _____ % of the total blame.

Dr. M. deserves _____ % of the total blame.

TOTAL 100 %

ASSUME THAT YOU ARE A CLINICAL PSYCHOLOGIST AND THAT SWIPLEY WENT TO SEE YOU INSTEAD OF DR. H. ASSUME THAT YOU JUST COMPLETED THE INTERVIEW WITH SHIRLEY WHEREIN INFORMATION ABOUT HER BACKGROUND, FORMATIVE EXPERIENCES, AND CURRENT COMPLAINTS WAS DISCUSSED.

Remember that you just met with Shirley.

7. Use percentages to describe what you see as the chances that Shirley's physical symptoms are or are not caused by emotional issues. NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

The chances that Shirley's physical symptoms ARE caused by emotional issues are: _____ %

The chances that Shirley's physical symptoms ARE NOT caused by emotional issues are: _____ %

TOTAL 100 %

8. Use percentages to describe what you see as the chances that weekly psychotherapy is the appropriate treatment recommendation for Shirley.

NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

Remember that you just met with Shirley.

The chances that weekly outpatient psychotherapy
IS appropriate treatment for Shirley are: _____ %

The chances that weekly outpatient psychotherapy
IS NOT appropriate treatment for Shirley are: _____ %

TOTAL 100 %

9. You have just completed the interview with Shirley and are considering various treatment options. You are considering, as Dr. M. did, the possibility of recommending that Shirley begin weekly outpatient psychotherapy immediately to deal with the emotional causes of her symptoms. If you decide to make this recommendation, what do you think the chances are that the following scenario will occur? PLEASE CIRCLE ONE OF THE PERCENTAGES ON THE SCALE BELOW.

Shirley will learn in therapy to talk more openly about her feelings about past and current relationships. As she progresses in therapy, her physical symptoms will disappear and her relationships with her husband and son will improve.

NO CHANCE OF
OCCURRING

CERTAIN OF
OCCURRING

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

10. You are still considering, as Dr. M. did, the possibility of recommending that Shirley begin weekly outpatient psychotherapy immediately to deal with the emotional causes of her symptoms. If you decide to make this recommendation, what do you think the chances are that the following scenario will occur? PLEASE CIRCLE ONE OF THE PERCENTAGES ON THE SCALE BELOW.

Before beginning therapy, Shirley's physical symptoms will worsen. Shirley will see a physician and discover that her physical symptoms are caused by a physical condition.

NO CHANCE OF
OCCURRING

CERTAIN OF
OCCURRING

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

11. Now you must evaluate the chances that EITHER scenario #1
OR scenario #2 will occur. YOUR PERCENTAGES MUST SUM TO 100%.

SCENARIO #1

Shirley will learn in therapy to talk more openly about her feelings about past and current relationships. As she progresses in therapy, her physical symptoms will disappear and her relationships with her husband and son will improve.

SCENARIO #2

Before beginning therapy, Shirley's physical symptoms will worsen. Shirley will see a physician and discover that her physical symptoms are caused by a physical condition.

THE CHANCES OF SCENARIO #1 OCCURRING ARE: _____ %

THE CHANCES OF SCENARIO #2 OCCURRING ARE: _____ %

TOTAL 100 %

12. Listed below is Dr. H.'s treatment recommendation followed by other possible treatment recommendations for Shirley. Assume that you are the clinical psychologist who interviewed Shirley. Please rank all the following treatment recommendations from:

1=HIGHEST PREFERRED RECOMMENDATION to 5=LEAST PREFERRED RECOMMENDATION.

Note that you are ranking each recommendation so make sure that each recommendation gets a number from 1-5 and no two recommendations get the same number.

Be sure to read the recommendations carefully so that you can distinguish between them.

- Advise Shirley to begin weekly outpatient psychotherapy.
- Advise Shirley to begin weekly psychotherapy and see a physician if her physical problems continue.
- Advise Shirley to see a physician right away.
- Arrange for more information FROM Shirley before making a definitive recommendation.
- Meet with other professionals to discuss the case before making a definitive recommendation.

13. Please assign a number from the scale below to each item.

DISAGREE		DISAGREE	AGREE		STRONGLY
STRONGLY	DISAGREE	SLIGHTLY	SLIGHTLY	AGREE	AGREE
1	2	3	4	5	6

- Shirley represented a difficult case for any clinical psychologist.
- There was not enough information about Shirley for Dr. M. to make an appropriate recommendation.
- Dr. M. should have discussed the case with other professionals.
- Dr. M. made an appropriate recommendation.
- No matter what, Shirley's physical symptoms should have been checked out by a physician.

14. To achieve the full purposes of this experiment, people were assign different kinds of clinical cases. Please check the kind of clinical case that you read.

- ___ A clinical case in which the treatment recommendation turned out to be very appropriate for the patient.
- ___ A clinical case in which the treatment recommendation turned out to be NOT very appropriate for the patient.
- ___ A clinical case in which there was no information about what happened to the patient after being given a treatment recommendation.

THANK YOU FOR YOUR COOPERATION

THE QUESTIONNAIRE

George Subjects

THERE ARE NO RIGHT OR WRONG ANSWERS TO ANY OF THESE QUESTIONS.

WE ARE INTERESTED IN YOUR OPINIONS REGARDING THIS CASE.

FOR QUESTIONS 1-5, PLEASE CIRCLE ONE NUMBER BETWEEN 1 and 6.

1. Based on this case, how would you rate the quality of Dr. M.'s overall clinical judgment?

VERY		SLIGHTLY	SLIGHTLY		VERY
POOR	POOR	POOR	GOOD	GOOD	GOOD
JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT
1	2	3	4	5	6

2. More specifically, how would you rate Dr. M.'s judgment that George was emotionally capable of leaving the hospital?

VERY		SLIGHTLY	SLIGHTLY		VERY
POOR	POOR	POOR	GOOD	GOOD	GOOD
JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT
1	2	3	4	5	6

3. How would you rate Dr. M.'s treatment recommendation, specifically that George be discharged from the hospital, that he see a vocational counselor to be placed in a suitable job and that he begin weekly outpatient counseling to help with the adjustment.

VERY		SLIGHTLY	SLIGHTLY		VERY
POOR	POOR	POOR	GOOD	GOOD	GOOD
JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT	JUDGMENT
1	2	3	4	5	6

4A. Assume that George follows Dr. M.'s treatment recommendation and he recovers. How much credit would you say George deserves for his recovery?

NONE	A LITTLE	SOME	MUCH	MOST	ALL
OF THE	OF THE	OF THE	OF THE	OF THE	OF THE
CREDIT	CREDIT	CREDIT	CREDIT	CREDIT	CREDIT
1	2	3	4	5	6

4B. Assume that George follows Dr. M.'s treatment recommendation and he recovers. How much credit would you say Dr. M. deserves for George's recovery?

NONE	A LITTLE	SOME	MUCH	MOST	ALL
OF THE	OF THE	OF THE	OF THE	OF THE	OF THE
CREDIT	CREDIT	CREDIT	CREDIT	CREDIT	CREDIT
1	2	3	4	5	6

4C. Assume that George follows Dr. M.'s treatment recommendation and he recovers. Assume that 100% of the credit must be assigned to George, Dr. M., or some combination of the two. Use percentages below to assign credit for George's recovery.

NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

George deserves _____ % of the total credit.

Dr. M. deserves _____ % of the total credit.

TOTAL 100 %

4C. Assume that George follows Dr. M.'s treatment recommendation and he recovers. Assume that 100% of the credit must be assigned to George, Dr. M., or some combination of the two. Use percentages below to assign credit for George's recovery.

NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

George deserves _____ % of the total credit.

Dr. M. deserves _____ % of the total credit.

TOTAL 100 %

5A. Assume that George follows Dr. M.'s treatment recommendation and he suffers certain consequences for not receiving inpatient psychiatric care right away. How much blame would George deserve for those consequences?

NONE	A LITTLE	SOME	MUCH	MOST	ALL
OF THE	OF THE	OF THE	OF THE	OF THE	OF THE
BLAME	BLAME	BLAME	BLAME	BLAME	BLAME
1	2	3	4	5	6

5B. Assume that George follows Dr. M.'s treatment recommendation and he suffers certain consequences for not receiving inpatient psychiatric care right away. How much blame would Dr. M. deserve for those consequences?

NONE	A LITTLE	SOME	MUCH	MOST	ALL
OF THE	OF THE	OF THE	OF THE	OF THE	OF THE
BLAME	BLAME	BLAME	BLAME	BLAME	BLAME
1	2	3	4	5	6

5c. Assume that George follows Dr. M.'s treatment recommendation and he suffers certain consequences for not receiving inpatient psychiatric care right away. Assume that 100% of the blame must be assigned to George, Dr. M., or some combination of the two. Use percentages below to assign blame for those consequences for George.

NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

George deserves _____ % of the total blame.

Dr. M. deserves _____ % of the total blame.

TOTAL 100 %

ASSUME THAT YOU ARE A CLINICAL PSYCHOLOGIST AND GEORGE WENT TO SEE YOU INSTEAD OF DR. H. ASSUME THAT YOU JUST COMPLETED THE INTERVIEW WITH GEORGE WHEREIN INFORMATION ABOUT HIS BACKGROUND, FORMATIVE EXPERIENCES, AND CURRENT COMPLAINTS WAS DISCUSSED.

Remember that you just met with George.

7. Use percentages to describe what you see as the chances that George is emotionally capable of leaving the hospital.

NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

The chances that George IS emotionally
capable of leaving the hospital are: _____ %

The chances that George IS NOT emotionally
capable of leaving the hospital are: _____ %

TOTAL 100 %

8. Use percentages to describe what you see as the chances that being discharged from the hospital, being placed in a suitable job, and beginning weekly counseling is the appropriate treatment recommendation for George.

NOTE THAT THE PERCENTAGES MUST SUM TO 100%.

Remember that you just met with George.

The chances that a hospital discharge, a suitable job, and weekly counseling IS appropriate treatment for George are: _____ %

The chances that a hospital discharge, a suitable job, and weekly counseling IS NOT appropriate treatment for George are: _____ %

TOTAL 100 %

9. You have just completed the interview with George and you are considering various treatment options. You are considering, as Dr. M. did, the possibility of recommending that George be discharged from the hospital to begin a new job and weekly outpatient counseling. If you decide to make this recommendation, what do you think the chances are that the following scenario will occur? PLEASE CIRCLE ONE OF THE PERCENTAGES ON THE SCALE BELOW.

The new job and the weekly counseling sessions will help greatly to build George's confidence and sense of well-being. George will become increasingly secure about functioning in society and his physical symptoms will subside.

NO CHANCE OF
OCCURRING

CERTAIN OF
OCCURRING

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

10. You are still considering, as Dr. M. did, the possibility of recommending that George be discharged from the hospital to begin a new job and weekly outpatient counseling. If you decide to make this recommendation, what do you think the chances are that the following scenario will occur? (Please circle a number from the scale below)

Immediately after being discharged from the hospital, George will become overwhelmed with anxiety. George will be unable to leave his apartment and will attempt suicide.

NO CHANCE OF
OCCURRING

CERTAIN OF
OCCURRING

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

11. Now you must evaluate the chances that EITHER scenario #1 or scenario #2 will occur. YOUR PERCENTAGES MUST SUM TO 100%.

SCENARIO #1

The new job and the weekly counseling sessions will help greatly to build George's confidence and sense of well-being. George will become increasingly secure about functioning in society and his physical symptoms will subside.

SCENARIO #2

Immediately after being discharged from the hospital, George will become overwhelmed with anxiety. George will be unable to leave his apartment and will attempt suicide.

THE CHANCES OF SCENARIO #1 OCCURRING ARE: _____ %

THE CHANCES OF SCENARIO #2 OCCURRING ARE: _____ %

TOTAL 100 %

12. Listed below is Dr. H.'s treatment recommendation followed by other possible treatment recommendations for George. Assume that you are the clinical psychologist who interviewed George. Please rank all the following treatment recommendations from:

1=MOST PREFERRED RECOMMENDATION to 5=LEAST PREFERRED RECOMMENDATION.

Note that you are ranking each recommendation so make sure that each recommendation gets a number from 1-5 and no two recommendations get the same number.

Be sure to read the recommendations carefully so that you can distinguish between them.

- Discharge George from the hospital, place him in a job and weekly outpatient counseling.
- Discharge George from the hospital and place him in a halfway house for men as a transition to living and working on his own.
- Refer George to the inpatient psychiatric unit of the hospital right away.
- Arrange for more information from George before making a definitive recommendation.
- Meet with other professionals to discuss the case before making a definitive recommendation.

13. Please assign a number from the scale below to each item.

DISAGREE		DISAGREE	AGREE		STRONGLY
STRONGLY	DISAGREE	SLIGHTLY	SLIGHTLY	AGREE	AGREE
1	2	3	4	5	6

-- George represented a difficult case for any clinical psychologist.

-- There was not enough information about George for Dr. M. to make an appropriate recommendation.

-- Dr. M. should have discussed the case with other professionals.

-- Dr. M. made an appropriate recommendation.

-- No matter what, George should have been kept in the hospital for more emotional help.

14. To achieve the full purposes of this experiment, people were assigned different kinds of clinical cases. Please check the kind of clinical case that you read.

- ___ A clinical case in which the treatment recommendation turned out to be very appropriate for the patient.
- ___ A clinical case in which the treatment recommendation turned out to be NOT very appropriate for the patient.
- ___ A clinical case in which there was no information about what happened to the patient after being given a treatment recommendation.

THANK YOU FOR YOUR COOPERATION

APPROVAL SHEET

The dissertation submitted by Laurie Anderson has been read and approved by the following committee:

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The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

04-02-86
Date

Jill Nagy Reich
Director's Signature