



10 Identifying and Reducing Causal Reasoning Biases in Clinical Practice

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In D.C. Turk & P. Salovey (Eds.)
1988. Reasoning, inference, &
judgment in clinical psychology.
New York: The Free Press.

THINKING about causes is a fundamental part of clinical practice. Both causes of clients' problems and therapeutic interventions (i.e., potential causes of desired change) must be considered. Why is Mr. Jones having anxiety attacks? And what experiences are most likely to alleviate his problem? In answering such questions clinicians make use of available evidence and previously acquired general knowledge to understand the causes of behavior. Unfortunately, there is much room for bias to enter into the deliberations, and obviously, the negative consequences of biased causal judgments could be serious. Of course, clinicians are aware of the possibility of bias in clinical judgment. Trainees are reminded to be objective and to look at an issue from more than one perspective. Yet recent research provides evidence that biased thinking is prevalent among both novices and experienced practitioners (Cantor, Smith, French, & Mezzich, 1980; Chapman & Chapman, 1967, 1969; Horowitz, Post, French, Wallis, & Siegelman, 1981; Temerlin, 1968).

Although we recognize that it is not possible to totally avoid bias, we believe that a reduction of biased thinking is possible. In this chapter we offer two approaches to reducing biases in thinking about causes: (a) increased awareness of potential sources of bias, and (b) activities designed to promote more normative causal inference. We will begin by reviewing research on sources of bias that might be present whenever causal judgments are made. Then we will consider sources of bias specific to clinical practice. We can mention only a few of the innumerable potentials for bias in clinical judgments. Our purpose is to increase

awareness, and we suggest that readers draw from their personal experiences to add to our list as they go along.

Next, we will suggest some bias-reducing activities. The general directives customarily given trainees to be objective and to avoid bias may be ineffective because they are *too* general. That is, the practitioner may be unable to relate such general directives to specific instances on the job. With this in mind, we will suggest a number of specific training procedures and exercises designed to help clinicians (and student clinicians) develop bias-reducing thinking habits that will remain operative in day-to-day practice. Again, we can mention only a few of many possible strategies, and we encourage readers to invent others.

Sources of Bias in Causal Reasoning

Among the major potential sources of bias in causal reasoning are the decision maker's causal beliefs, the structural features of situations, and the information available about the people involved in those situations. These factors affect the decision maker's expectations, which in turn guide the selection of a cause to explain a given outcome. In the following sections we will consider a number of these factors, beginning with causal beliefs.

Causal Beliefs

Causal beliefs take many forms. They range from specific beliefs about why a particular event occurred (e.g., attributions), through fairly broad conceptions about how two or more variables are related (e.g., social theories), to general beliefs about the meaning of life (e.g., philosophical or religious beliefs). Our causal beliefs influence a wide variety of thoughts, feelings, and behaviors. They influence motivation, emotional reactions, performance, assessments of new information, and judgments about future performance, as discussed earlier in this volume by Snyder and Thomsen.

Lord, Ross, and Lepper (1979) demonstrated that people who hold different social theories may evaluate new data relevant to those theories in a biased fashion. Subjects who initially held different beliefs about the efficacy of capital punishment laws as deterrents to murder evaluated two purportedly authentic studies on this issue. Studies that supported subjects' views were evaluated as methodologically superior to those that contradicted them. Furthermore, having seen a mixed set of studies (one supporting and one contradicting their initial views), the subjects did not moderate their initially extreme views; instead, they became even more convinced that their initial causal beliefs were correct.

In the attribution domain, researchers have found that prior beliefs about the abilities of a target person (self or other) influence attributions made for success and failure at tasks related to those abilities. For example, Feather and Simon (1971a,b) showed that people tend to attribute expected outcomes to the target, and unexpected outcomes to factors external to the target. So if Jane is believed to be a competent and responsible worker, then loss of her job (an unexpected outcome) is more likely to be attributed to economic recession than to inadequate job performance. (Other theoretical bases for these ideas are described earlier in this volume by Jordan, Harvey, and Weary.)

Although there are many studies showing effects of causal beliefs on interpretation of new information, such effects are not found universally. Anderson and Sechler (1986) manipulated subjects' causal beliefs about the relation between a personality trait and subsequent behavior (a social theory). Subjects later were given new information about the trait-behavior relation and were asked to evaluate this new information. There was no biasing effect of prior causal belief. Subsequent research in a similar paradigm also has failed to yield a biased evaluation effect (Anderson & Kellam, in preparation).

Thus, prior causal beliefs sometimes do and sometimes do not lead to biased evaluation of new information. But the conditions that give rise to the effect are not yet clear. Anderson and Sechler (1986) speculated that biased evaluation may occur primarily when the causal belief is strongly held, is ego involving, is extreme, is connected to other cognitive systems, or when a justifiable rationale for selectively valuing and devaluing new information is available. Despite the lack of evidence about which of these variables is (are) important in producing the effect, clinical judgments are at risk because several of these factors could be present.

Social theories and attributions also have been shown to influence judgments about future performances. In the Anderson and Sechler work, subjects also made judgments about future outcomes in situations related to the social theories manipulated earlier in the experiments. In domains as varied as child abuse, delay of gratification, and job performance of firefighters, manipulated causal beliefs affected judgments.

Similarly, attributions for prior outcomes affect future success expectancies. For instance, people led to attribute initial failure at an interpersonal persuasion task to lack of effort or to use of an ineffective strategy are more optimistic about their future performances than those led to attribute initial failure to lack of ability or to interfering personality traits (e.g., Anderson, 1983a; Anderson & Jennings, 1980; Anderson, Jennings, & Arnoult, 1987). Similar effects occur with attributions and expectations about others. (See Weiner, 1985, for a review and theoretical integration.)

The links between causal beliefs and motivation, performance, and

emotion are also well established. In the Anderson (1983a) study cited above, people who were led to attribute initial task failures to effort or strategy problems persisted longer at the task and eventually obtained higher success rates than those in the ability/trait attribution conditions. Weiner, Russell, and Lerman (1979) showed that many emotions are linked to specific attributions and to attribution-outcome combinations. For instance, an achievement failure attributed to others' interference produces anger, a failure attributed to one's own lack of ability produces feelings of incompetence, and a success attributed to ability produces pride (see also Weiner, 1982). Indeed, developmental research reveals that even young children understand many of the relations between attributions and emotional reactions in others, and that they will modify their reported attributions to produce the desired emotions in others (Weiner & Handel, 1985).

Given the importance of causal beliefs, it would be helpful to know more about how those beliefs are derived and how errors might occur. These questions have been the subject of extensive research, a review of which is beyond the scope of this chapter. Interested readers may want to refer to classic works by Heider (1958), Jones and Davis (1965), Kelley (1967), and Weiner (1974). For a sampling of more recent work see Harvey, Ickes, and Kidd (1976, 1978, 1981) and Nisbett and Ross (1980, especially chap. 6). One principle of interest to the present discussion is that people tend to infer causal relations between events that occur together. For example, if John is nervous when he goes to the doctor, it might be inferred that going to the doctor makes John nervous. Although this type of reasoning is often useful, it can lead to inference errors. Correlations do not always represent causal relations, and even when they do, the direction of causality may be unclear. For instance, John may go to the doctor *because* he is nervous.

Causal Structure of Situations

Recent research has yielded further insights into factors that affect the selection of causes. It has been shown, for example, that the selection of a cause for a particular outcome can be affected by certain structural features of the situation in which the outcome occurred.

The notion of causal structure of situations actually derives from a larger two-stage model of attributions (Anderson, 1983b, 1985; Anderson & Slusher, 1986). The first stage is an information-gathering one. The features of the situation (including the type of situation, the outcome, and the goals of the attributor) are matched to available guiding knowledge structures. The one that best matches is selected and used to guide further information search. For example, it will suggest what kinds of information are needed to arrive at a sufficient explanation. In

a sense, the guiding knowledge recruits other knowledge from the past (e.g., other knowledge structures about the attributional target) and from the present situation. It also suggests the most likely causes or causal candidates for the situation and the information needed to test these candidates. In the second stage, the attributor uses the recruited information to test the most likely causal candidates, one at a time. The search is best characterized as a truncated search (Shaklee & Fischhoff, 1982). That is, as soon as a sufficiently reasonable fit between a causal candidate and the recruited information is found, the search is abandoned and an attribution is made. Thus, the most salient causal candidates (those thought of first) have the best chance of being selected even if they do not provide the best fit to the information. If the first candidate does not fit well, then the second is considered. This continues until a candidate fits, or until all candidates have been tested. At that point, the attributor will either abandon the search, or will attempt to use a different guiding knowledge structure with a different set of causal candidates and different sets of relevant information.

The idea of causal structure of situations is that different causes are listed as causal candidates for different types of situations. Indeed, one way of changing which guiding knowledge structure is selected at the outset is to make a particular type of cause salient. This essentially primes those knowledge structures that contain that cause. It is through this process that seemingly innocuous attribution manipulations, such as having a confederate mention a particular type of cause prior to any task engagement, have robust effects on success expectancies, motivation, performance strategy, and performance quality (Anderson, 1983a; Anderson Jennings, 1980, Anderson, Jennings, & Arnoult, 1987; Jennings, 1980; Kiesler, Nisbett, & Zanna, 1969).

This model applies to self-attributions, other attributions, and to more general explanation processes (cf. Kruglanski, 1980). The major difference between self and other attributions, from this perspective, is the kinds of information (in knowledge structures) available for use. Actors typically have a much greater store of target-relevant information than do observers (see Jones & Nisbett, 1972; Monson & Snyder, 1977). When this is the case, we expect final attributions (result of the second stage) to be more closely related to causal structure for observers than for actors. This is because observers have relatively little information to contradict the causal candidates suggested by the causal structure of the situation, whereas actors have relatively more information to force attributions away from the causal structure candidates. This predicted difference between actor and observer attributions has been obtained by Anderson (1985). (See also chapter by Jordan, Harvey, and Weary, this volume, for more information on actor-observer differences in attribution.)

Argument Availability

Because of the potential for error in the formulation of causal beliefs, our ability to determine the validity of our beliefs is of great importance. Unfortunately, there is evidence that people do not always use effective criteria in evaluating their beliefs. Sometimes, for example, they rely too heavily on judgmental heuristics such as the availability of arguments, the ease or readiness with which arguments for or against a particular belief come to mind.

A long series of studies of social theories has supported the idea that argument availability (or accessibility) often is used to judge the validity of social theories. More specifically, we seem to use the availability of supporting causal arguments relative to the availability of causal arguments for alternative social theories in judging theory validity (Anderson, 1982, 1983d; Anderson, Lepper, & Ross, 1980). For instance, whether we think the best placement policy (in general) for abused children is to remove them from their abusing parents permanently or to reintegrate them depends upon whether we have created causal theories in favor of removal or in favor of reintegration (Anderson & Sechler, 1986). The most direct support for the argument availability hypothesis comes from Anderson, New, and Speer (1985). In that study, subjects were led to believe, via two case histories, that either a positive or a negative relation exists between a person's risk preference (as measured by a paper and pencil test) and his or her subsequent performance as a firefighter. This procedure leads most subjects to create causal social theories linking risk preference and firefighting ability (Anderson, 1983d). Later, the subjects were informed that the initial case histories were totally fictitious. Subjects' personal beliefs about the true relation between the two variables were then assessed. Finally, subjects were asked to write out causal arguments in favor of each of the two competing social theories (positive and negative). Within-cell correlations and covariance analyses revealed that subjects' personal beliefs were significantly correlated with the availability of competing causal arguments. Those who could create more arguments in favor of the positive theory than the negative theory tended to believe the positive theory was correct, and made social judgments in line with that belief (and vice versa).

So we see that decision makers may overestimate the validity of particular causal beliefs due, in part, to their inability to generate arguments opposing those beliefs. But what if they encountered opposing arguments without having to generate them? What if they were presented with strong evidence that their causal beliefs were unfounded? Then could we expect a revision of the beliefs? Unfortunately, the answer is "not always," as other research on belief perseverance has shown.

Belief Perseverance

Perseverance of beliefs in this domain usually means the *unwarranted* persistence of beliefs in the face of empirical or logical challenges. The phenomenon was first popularized by Ross, Lepper, and Hubbard (1975), who showed that both self- and social impressions can persist to a normatively unwarranted extent. In particular, they showed that beliefs about one's own or others' social perceptiveness can survive even the total discrediting of the evidential base that gave rise to those beliefs. Subsequent research demonstrated this effect in the domain of social theories, beliefs about how variables in the social environment are related to each other (Anderson et al., 1980). The processes underlying the perseverance effect have been the target of much investigation. Perhaps the most consistent finding is that some type of explanation process underlies the effect. The results for self-beliefs have been somewhat equivocal, perhaps because people may develop quite different explanations for outcomes when they are actors rather than observers. The different explanations may, in turn, have quite different implications for subsequent judgments.

The results of studies on social theories have been more consistent. For instance, the type of data that induces the initial theory influences the amount of perseverance. Concrete data (as in case histories) induce more causal processing than do abstract data (as in statistical summaries). A consequence of this is that concrete data lead to stronger perseverance biases than do abstract data, even when the abstract data are logically superior (Anderson, 1983d). This phenomenon supports the notion that the availability of causal explanations or arguments is a primary determinant of social theories.

Other support comes from work that showed the effect of forcing people to consider alternative explanations or arguments or to take an opposing perspective. Several lines of work have shown that such "counterexplanations" reduce (and sometimes eliminate) the bias (Anderson, 1982; Anderson & Sechler, 1986; Koriat, Lichtenstein, & Fischhoff, 1980; Lord, Lepper, & Preston, 1984; Slovic & Fischhoff, 1977). Anderson (1982) showed that this type of procedure works both when introduced before the initial data are encountered (an inoculation procedure) and after the data have been examined and explained (a counterexplanation procedure). The strength of this debiasing procedure did not differ as a function of timing (before or after data examination), but the way it worked did differ with timing. The inoculation procedure led subjects to be more cautious in interpreting the subsequent data, whereas the counterexplanation procedure had its entire effect after the data had been examined and interpreted.

The research on the effects of counterexplanations is reminiscent of earlier work concerned with the effects of counterattitudinal role playing on attitude change. Sometimes, role playing led to attitude change, but not always (see Elms, 1967; McGuire, 1966, for reviews). Several different counterattitudinal role-playing paradigms were used. For example, in one paradigm subjects enacted emotional scenes that contradicted their attitudes, as in playing the role of a smoker who discovers that he or she has cancer (Janis & Mann, 1965). The paradigm most relevant to our current discussion involves writing counterattitudinal essays. Several findings from this research tradition parallel the explanation/counterexplanation work quite closely.

The main findings of interest were that: (a) When people expect to defend their own opinion, they tend to accept supporting arguments as valid and reject opposing arguments as invalid, but do not show this evaluation bias when they expect to defend the opposing opinion (Greenwald, 1969); (b) People assigned to improvise arguments in favor of one or the other side of an issue (e.g., the desirability of generalized vs. specialized undergraduate education) change their opinions in the direction of assignment. They also remember personally improvised arguments better than experimenter-presented arguments (Greenwald & Albert, 1968); and (c) Counterattitudinal essay writing does not produce attitude change when people are provided an opportunity to consider and reject the counterattitudinal arguments prior to being assigned to defend that position, but the attitude change effect does occur when the assignment to defend the position occurs before the opportunity to consider and reject arguments (Greenwald, 1970).

The counterattitudinal studies did not look at the specific nature of the arguments being considered or improvised. Specifically, they did not address the notion that *causal* explanations seem to be particularly important. That is, people seem to be particularly concerned about understanding causal relations (Heider, 1958). And we might speculate that counterattitudinal arguments that are causal in nature are likely to have stronger effects on subsequent attitudes than are other kinds of counterattitudinal arguments. It is also important to note that in Greenwald's work the opinions were very similar to social theories, whereas in others' work (e.g., Janis & Mann, 1965) the opinions were less theory-like.

Imagination

Some of the early work on emotional counterattitudinal role playing (e.g., Janis & Mann, 1965) suggested that imagined visual scenes may be causal in nature and may have strong effects on expectations and behavior.

More recent work has explicitly tested the effects of imagining scenes on expectations and behavior.

Self-judgments and social judgments concerning the likelihood of a person engaging in certain behaviors are based to a great extent on how easy it is to imagine the person doing the behaviors. There is a visual quality to many such judgments, as reflected in everyday language. Consider statements such as "I can't imagine myself doing (x)," or "I see myself doing (y) five years from now," or "It is difficult to visualize her doing (z) on her own."

Recent research suggests that imagining behavioral scenarios (i.e., multiple scene scripts) is used to make several kinds of probability judgments, including self-expectations (Anderson, 1983c; Anderson & Godfrey, in press; Gregory, Cialdini, & Carpenter, 1982; Sherman & Anderson, in press) and social expectations (Anderson & Godfrey, in press). In addition, imagining single scenes affects likelihood judgments about the self and others (Carroll, 1978; Sherman, Cialdini, Schwartzman, & Reynolds, 1985) and stereotype-based frequency estimates (Slusher & Anderson, 1987).

The determining factor seems to be the ease of imagining behaviors. To the extent that a particular behavioral scenario is easy to imagine, one judges the likelihood of the main characters in the scenario actually performing the behaviors to be relatively high. Thus, by inducing people to create such scenarios, thereby making them cognitively available, one can change likelihood estimates (expectations) about the main character, whether oneself or another (Anderson, 1983c; Anderson & Godfrey, in press). Similarly, because people imagine stereotype-congruent scenes when complete information is lacking and then confuse imagined features with presented ones, people's expectations and judgments about others tend to be biased in favor of the relevant stereotypes (Slusher & Anderson, 1987).

In summary, we have seen that causal beliefs (both verbal and imagined) can be important determinants of expectations, judgments, and behaviors. Of particular interest to the present discussion is the influence of causal beliefs on the handling of information, including the inference of cause-effect relations. Unfortunately, causal beliefs are not always valid, and effective validity criteria are not always applied. Further, there is a tendency to persist in erroneous beliefs despite contrary evidence, though recent research has given us some ideas about how to counteract this tendency. Because causal beliefs influence the selection of specific causes to explain specific outcomes, invalid beliefs can introduce bias into the selection process. So far we have discussed possible sources of bias in causal reasoning that might occur regardless of the context in which the causal judgments are made. We turn now to sources of bias specific to clinical practice.

Sources of Bias Specific to Clinical Practice

Just as causal beliefs can introduce bias into causal reasoning, so too can certain elements of clinical practice contribute to error. The therapy setting itself, client characteristics, and other therapists are among the variables that can bias thinking. Generally, such factors affect the derivation of causes, just as causal beliefs do, through their influence on expectations. In the following sections we will examine some of these factors. Again, our purpose is to raise awareness of the potential for bias. We hope that readers will go beyond the instances given here to search out other sources of bias, paying particular attention to idiosyncratic aspects of their own practice environments.

The Therapy Setting. Many features of the therapy setting can influence thinking about the likely causes of client problems or about the possible causes of desired changes. For example, if a client reports repeated failures at work and difficulty getting along with co-workers, then lack of motivation is one possible cause. But this potential cause may be more salient to inner-city practitioners than to others working in suburban settings, simply because of the setting. Of course, it may be that lack of motivation really is more common among the clients seen at some inner-city facilities, but thinking is biased if this cause is accepted too readily at the expense of overlooking other possible causes. Another problem is that the kinds of services most frequently provided in a given setting may become the most salient forms of treatment, possibly leading the therapist to define the client's treatment needs in terms of those services while overlooking less salient treatment alternatives (cf. Kadushin, 1969).

Client Characteristics and Unrepresentative Client Behaviors. Expectations about clients are affected by demographic variables (age, sex, race, ethnicity, marital status, education, occupation, and general socioeconomic status), the client's apparent desire for treatment (e.g., is treatment voluntary?), and his or her physical appearance (health, dress, and grooming). All of these factors can activate stereotypes and bias the therapist toward typical cause-effect relations. The causes that immediately come to mind when a 45-year-old man, happily married for 20 years, reports loss of interest in his marriage are likely to be quite different from those first thought of when a recently married 20-year-old reports the same problem. Similarly, available information from the client's past, such as recordings about client characteristics and previous diagnoses, if any, can lead the therapist too quickly to the conclusion that the current problems are repetitions of previous ones.

On the other hand, one striking but unrepresentative instance of behavior directly observed, involving thinking about a client's

the past. The observed instance may not be typical of the client's behavior. But being more concrete and vivid, it is more likely to make a strong impression and to be remembered easily than is more abstract information, such as that found in case records. Several studies of memory provide evidence that concrete information is more likely to be remembered than is abstract information (e.g., D'Agostino, O'Neill, & Paivio, 1977; Richardson, 1974). Further, social psychologists have demonstrated that concrete information has more impact on decisions than does abstract information (Borgida & Nisbett, 1977). Also, Anderson (1983d) found more perseverance of beliefs when they were based on concrete rather than abstract data. So one observation of a woman dramatically escalating conflict can overshadow more pallid recordings about repeated conflict avoidance, and a need for conflict may be judged a likely cause of her inability to keep friends. In all of these cases, bias arises from the practitioner's overdependence on generally useful guidelines. Certainly direct observations of current behavior are important. The problem stems from overweighting these observations despite less salient but, perhaps equally valid, data. Maybe the woman's major problems actually are more closely related to low self-esteem, which usually leads her to avoid conflict in an effort to retain her friends.

Therapy Modalities, Therapy Specializations, and Other Therapists. Therapy modalities (e.g., behavioral, humanistic, analytic) represent different theoretical approaches to understanding behavior and effecting behavior change. And theoretical approaches to behavior are, in large part, statements of cause-effect relations. There is danger, therefore, that causal explanations consistent with the therapist's own orientation will be so readily accepted that other possibilities are given insufficient consideration.

Closely related to biases arising from therapy modalities are those arising from therapy specializations. If one has acquired a reputation for successfully treating communication problems, then a client's communication style may receive an unfair share of one's attention.

Instructors, supervisors, colleagues, even famous therapists can contribute to bias in much the same way as therapy modalities and therapy specializations can, by providing strong statements about cause-effect relations. Practitioners may think back to something a respected teacher used to say, perhaps overestimating the relevance of the teacher's words to the judgment at hand.

The Clinician's Personal Experiences. Therapists are not immune to subjectivity. Biases originating within the therapist may be among the most difficult to recognize. One potential source of such biases is the therapist's personal psychological experiences. If the clinician once suffered from a prolonged anxiety over career

decisions, then the causes of the clinician's own problem are likely to come to mind when clients with the same problem are encountered. Similarly, therapists can be biased by their experiences with former clients. Certain former clients and the causes of their problems may be especially memorable. If, for example, a former client's problem was constant teasing of others, and the teasing turned out to be an expression of hostility, then hostility may be immediately suspected when a new client teases constantly. The new client's lack of skill in expressing affection appropriately (another possible cause of the teasing) may be neglected.

To summarize, potential sources of bias specific to clinical practice include the therapy setting, client characteristics, striking but unrepresentative client behaviors, theoretical orientations, treatment specializations, other therapists, and the practitioner's personal experiences. These factors can cause biased causal reasoning chiefly through their effects on the therapist's expectations. If such errors were easily corrected by exposure to specific case data, then we would have somewhat less reason for concern. However, a large body of work from a variety of areas of psychology demonstrates that such expectation-based errors are extremely difficult to correct. New information may be sought and interpreted through expectation-confirmation processes (e.g., Lord et al., 1979; Snyder & Swann, 1978). Or the initial guess may get fixed and other information totally ignored (e.g., Anderson, 1983c; Shaklee & Fischhoff, 1982). Finally, there are numerous personal, situational, and social forces at work that tend to make initial expectations rigid. For instance, internal consistency pressures as well as social pressures to maintain group solidarity can interfere with rational inference change processes (e.g., Festinger, 1957; Janis, 1972).

Thus, the presence of these various sources of bias raises concern about the probability of error in judging the causes of behavior problems and finding the most likely route to adaptive behavior change. Practitioners should be alert to biasing influences in their own milieu and within themselves. Although awareness is a useful first step in reducing bias, much more can be done. In the remainder of this chapter we suggest a number of activities aimed at the development of bias-reducing thinking habits.

Bias-Reducing Procedures and Exercises

An effective general strategy for reducing bias in causal inference is to hypothesize more than one cause-effect relation. That is, for any given outcome consider as many possible causes as can be generated. Chamberlin (1897) first suggested the formulation of multiple working hypotheses as a means of avoiding bias in scientific inquiry, and scientists

in fields as diverse as physics and psychology still value this method. As mentioned above, it has been proposed that in everyday causal inference people do, in fact, generate several causal candidates and then try to select the one that provides the best explanation for the outcome in question (Anderson, 1983b; Kruglanski, 1980). However, there is evidence that people tend to seize upon the first cause that provides a reasonable (though not necessarily the best) explanation and fail to complete a thorough search for alternatives (Shaklee & Fischhoff, 1982). The activities we will suggest for reducing bias in causal reasoning are designed to encourage the routine generation of alternative causes and the careful evaluation of alternatives. We will present our suggestions in the order that they might be used in making causal inferences.

Gathering Information

Generating as many causes as possible requires gathering as much information as possible. Reviewing case records, if any, and interviewing clients are the first steps. Further information might be gained by examining clients' functioning in all of their roles and in various settings. For example, if a man is having difficulty concentrating at work because he believes that his co-workers are plotting to destroy his career, then it would be useful to know if he has any similar suspicions about family members, friends, neighbors, and so on. Are there times at work when he is not bothered by such ideas? If so, what is distinctive about those times? How is he functioning in other roles, as a father, for example, or as a son? What information might be gained from the people in his various environments? It may be possible to interview some of these people or to observe the client in various settings.

Another approach to gathering information is to make separate assessments of the different aspects of the client's psychological functioning. Lazarus (1976), for example, suggests assessments of behavior, affect, sensation, imagery, cognition, interpersonal relations, and need for medication, as a means of both specifying problems and determining appropriate treatments.

In addition to these methods, we suggest that clinicians make a list of questions to ask themselves about each case. For instance, "What information is missing, and how might it be relevant?" or, "Have I given enough consideration to possible environmental constraints on the client's behavior?" Research has shown that attributing too much responsibility to the actor in a situation while discounting external factors is a common error. (See, for example, discussion of the "fundamental attribution error" in Nisbett & Ross, 1980; Ross & Anderson, 1982.) The list of questions should be reviewed and expanded periodically through-

out the course of treatment. Such lists also could be reviewed in supervisory sessions or group training sessions.

After every effort has been made to collect as much relevant information as possible, there remains the problem of keeping that information available to the therapist as treatment proceeds. Because information can be forgotten, or remembered inaccurately, clinicians should not be dependent on their own memories. More efficient means of keeping data available are needed (cf. Arkes, 1981). Therapists should work on designing recording instruments that are systematic and not too time consuming. As an example, a chart could be made of the client's behaviors, listing specific statements and actions, with a column for recording the frequency of the behaviors on different occasions. More behaviors could be added as needed. Therapists should pay attention to occasions when the behaviors do not occur as well as occasions when they do. They also might share their recording methods with colleagues, who could try using them for their own cases. Then the advantages and the disadvantages of the various methods could be reviewed by all, and the best features of each method might be incorporated into some new recording instruments. Procedures such as these should help put practitioners in a better position to handle the next step in clinical causal inference: determining the causes of clients' problems and the most promising causes of change.

Determining Causal Relations

Recall that the general strategies underlying our suggestions are the generation of alternative causes for a given outcome (behavior problem or behavior change) and the effective evaluation of alternatives. In the following sections we will describe a number of activities designed to develop clinicians' abilities to generate and evaluate alternatives.

Multiple Judges. One way to generate alternative causes is to use multiple judges. That is, provide a group of clinicians with the available information from one case, and have each of them independently generate as many causes as possible for particular outcomes. Then participants could share the causes they have generated. If students are included in the group, the more experienced practitioners could be the last to share their ideas, as it is likely that they could generate some causes that students had not. The emphasis in this exercise would be not on thinking of *good* causes, but rather on generating as many *reasonable* causes as possible. Causes would first be shared without any explanation of how they had come to mind. After all participants had stated their causes, each could describe as far as possible how the causes were gener-

ated. Repeated use of this activity should help clinicians develop a more exploratory approach to considering available information.

Empathy. Another means of generating multiple causes is to apply one of the basic clinical tools, empathy. Looking at case data from another's point of view could lead the clinician to think of causes that would otherwise be overlooked. An obvious alternative perspective to try is that of the client. What would the client say about the cause(s) of the behavior problems? What does the client think might create the desired behavior changes? Assuming the client's perspective also could provide a challenge to the therapist's tentative causal theories. For example, if the therapist thinks the client's poor performance is due to lack of motivation, then taking the client's point of view could help make the therapist aware of what the client has tried to do about the problem and of how much effort the client has applied. After this exercise, the therapist might decide that the motivation factor is not as important as it had seemed to be. On the other hand, the exercise might provide support for the motivation-performance hypothesis. Other perspectives that clinicians might assume include those of the client's family members, friends, and co-workers; the clinician's various instructors, supervisors, and colleagues; and other therapists whose theoretical orientations differ from the clinician's own.

Recall that imagining behavioral scenarios can affect one's expectations, which may in turn affect one's causal explanations. Imagining scenarios related to the client's problems from different perspectives could give further insights into the etiology and possible resolution of the problems.

Role Playing. Assuming another person's perspective can be made a more vivid experience by actually acting out the role of the other person. Some clinicians have used role playing to help clients gain new perspectives. For instance, married couples in conflict might enact each other's role to improve their understanding of the other's point of view. Also, clients sometimes are able to change their behaviors, thinking, and affective reactions by acting out unfamiliar behaviors, as is done, for example, in assertiveness training. Similarly, role playing might help clinicians break away from their habitual approaches to causal judgments. As an example, pretending to be a therapist whose theoretical orientation is different from one's own could direct attention to information that might be neglected when reviewing evidence from one's own perspective. Attending to such information could, in turn, lead to the generation of alternative causal hypotheses that might otherwise have been overlooked.

Another way to use role playing would be to have a group of clinicians who know each other well generate alternative causes, with each participant approaching the problem as he or she thinks one of the others might. This would be followed by comments from other group members. This exercise could give clinicians insight into biases that they share with others in the group as well as their own idiosyncratic biases.

Videotapes. There are a number of ways to use videotapes of client interviews or of clients interacting with each other to reduce biases in causal reasoning. One simple method is for therapists to view a videotape and then simply reproduce (preferably in writing) as much information as they can recall. Then the film would be viewed again, and comparisons made between actual and recalled information. This could alert therapists to any inaccuracies in memory that might have resulted from biased perception or interpretation of data, the evidence on which any future causal inferences would be made. Recall could follow immediately after the first viewing, or after a delay (perhaps one week), or both. Generally, memory inaccuracies due to biases can be expected to increase over time.

Another way to use videotapes to improve causal reasoning is to have several therapists view the same tape, independently generate causes, and then share their conclusions. Alternatively, therapists could watch one film repeatedly, assuming a different perspective each time and generating causes from each perspective. Again, possible perspectives include those of other therapists, the client's family members, and so on.

Statistics. Courses in statistics are a routine part of the clinician's training. However, statistics often are viewed exclusively as research tools, and the potential for applying statistical logic to clinical judgments may be unrecognized. In causal inference problems the application of knowledge about concepts such as probability (e.g., consideration of base rates), correlation, and regression can help the clinician with the appropriate sampling and weighting of evidence and can prevent several kinds of errors in identifying causal factors. Use of base-rate information, for instance, can reveal how likely an outcome is (was) to occur regardless of the presence or absence of a particular hypothesized cause. An understanding of correlation can prevent the common error of inferring a causal relation when only covariance exists. And knowledge of regression can aid in evaluating the relevance of extreme behaviors and correctly identifying the causes of both extreme and more typical behaviors. A common error is to attribute a change from an extreme to a more typical behavior to an event immediately preceding the change; in fact, such a change frequently is due to normal regression toward the mean and is totally unrelated to the intervening event. (See Kahneman &

Tversky, 1973, for a discussion of this and related issues.) Because clinicians may fail to recognize the relevance of statistical concepts to their work with clients, it would be helpful to incorporate examples from clinical practice into statistics courses, to have the students provide examples, and to incorporate statistical thinking into clinical practice. Besides improving clinical judgments (including causal judgments), this procedure could increase interest in studying statistics.

Rating Scales. One way that use of rating scales can reduce bias in causal reasoning is by helping clinicians to resist the tendency to stereotype clients and to infer cause-effect relations that fit such stereotypes. For example, if many of the therapist's clients are very similar in some way (e.g., ethnicity, socioeconomic status) or have similar psychological problems, there might be a tendency to overlook a particular client's distinguishing characteristics or behaviors. This tendency could be counteracted by rating the client for similarities to and differences from typical clients encountered. Rather than one global similarity rating, multiple ratings of specific traits and behaviors should be made. Use of this procedure lessens the chance of hypothesizing an erroneous, stereotype-based causal relation. The need for alternative causes becomes more apparent.

Rating scales also could be used to lessen the tendency to think in terms of dichotomies. People tend to ask whether a potential cause was present or absent, or whether a factor caused or didn't cause an outcome. Use of rating scales might reveal that a potential cause was present *to some degree*, or that a particular factor had *some* but not *total* influence on the outcome. Again, the need to generate alternatives may be more easily recognized.

Balance Sheets. A balance sheet offers a systematic way to evaluate evidence for and against a hypothesis about the cause of a psychological problem. A balance sheet might list each item of evidence (pro and con), accompanied by ratings of various kinds. Balance sheets could be constructed for each of several causal hypotheses, so that the relative merit of each alternative could be assessed. Therapists could invent several different formats for balance sheets, share their inventions with colleagues, and try formats designed by others. Similarly, balance sheets could be used to evaluate one or more choices for treatment (i.e., proposed causes of behavior change).

Graphics. Graphics of several kinds (e.g., flowcharts, organization charts) can be used to illustrate hypothesized causal relations and to generate alternatives. Clinicians should be innovative in drawing graphic illustrations, perhaps using symbols to represent various kinds of rela-

tions and writing or drawing in several colors. Use of graphics can help clarify the relevance or centrality of a proposed cause to the outcome in question, possibly forcing implicit assumptions to be made explicit. Graphic illustrations also can help identify items of evidence that do not fit easily into the picture. Studying items that don't seem to fit might provide valuable insights and suggest alternative causal scenarios.

Graphics can be used to clarify the direction of causality in relations. For example, one might ask if a particular symptom is an effect, a cause, or both. Illustrations could help to identify relations that are unidirectional, bidirectional, or cyclical. They can reveal mediating causes, spurious correlations, or multiple causes of an outcome. They also can help to distinguish among predisposing, precipitating, and maintaining causes. Like other methods discussed earlier, use of graphics can help the clinician evaluate proposed causes of both problems and desired changes.

Questions. In the section on information gathering we suggested that clinicians make a list of questions to ask themselves as a means of assessing the adequacy of their data collection efforts. We suggest also that a list of questions concerning the generation and evaluation of causes be prepared and periodically updated. The list might include questions similar to the following:

- Have I examined the problem from several perspectives?
- Have I given careful thought to the direction of causality?
- Have I considered the possibility of regression effects?
- Have I given equal attention to each alternative cause?

Such questions can be used by clinicians individually and reviewed in consultation with others. Questions that cannot be answered satisfactorily indicate a need for further efforts to generate alternative causes or for more thorough evaluation of proposed causes.

Written Explanations. Putting hypothesized causal explanations into writing is an excellent way to clarify thinking about causal relations. Written explanations might delineate causes, effects, directions of causality, and other interrelations. They also should include the rationale behind the proposed causal hypotheses. In writing the explanations, vague ideas may become sharper, and ideas that remain vague may be discarded. This procedure could help clinicians identify faulty assumptions, logical errors, and inconsistencies. It could reveal gaps, such as missing data or unaccounted-for effects. Also, putting proposed causal relations into writing could bring to mind new alternative causes. In the case of several competing hypothesized causes, written explanations could help the clinician assess the relative worth of each. A thera-

pist's written explanations could be reviewed by colleagues, whose objectivity might enable them to recognize any flaws that the therapist has overlooked.

In the preceding sections we have presented several methods for generating and evaluating alternative causes. As far as possible, clinicians should suspend final judgments (i.e., selecting specific causes for specific outcomes) until they have applied the methods that they believe will be helpful. Eventually, though, a decision will be made about the cause(s) of a particular outcome. And when a judgment is made, that judgment should be evaluated. In the next section we offer some suggestions for the evaluation of causal judgments.

Evaluating Causal Judgments

Even carefully made causal judgments can be inaccurate, and therefore, they should be questioned. Working alone, therapists can apply the counterexplanation procedure described above. That is, if the therapist thinks that X causes Y, then he or she should try to explain (perhaps in writing) why X might not cause Y; why Z, A, B, or C might cause Y. In other words, therapists should argue with themselves, questioning their own reasoning. Readers familiar with Ellis's rational-emotive therapy will notice a similarity between this method and Ellis's method of teaching clients to dispute the rationality of their dysfunctional beliefs (e.g., Ellis, 1977). In group sessions, the therapist's colleagues could help by providing additional counterexplanations. Group members also could take turns playing devil's advocate, raising every possible objection to the therapist's judgment. Recall that people appear to judge the validity of their theories by the relative availability of arguments for and against the theories. Once clinicians have made causal judgments, they have arguments *for* their theories. Use of counterexplanations and devil's advocates can expose them to arguments *against* the theories.

In the event that causal theories are shown to be inaccurate, instructors and supervisors can help clinicians resist tendencies to cling to the discredited theories by reminding them of the perseverance phenomenon and how it operates. (Ross et al., 1975, found that awareness of the mechanisms of perseverance can reduce the effect.) And there is yet another way that instructors can help their students. Most experienced clinicians can recall cases in which their own causal judgments were proven wrong. That is, they thought they understood the cause(s) of a client's problem, only to be surprised by the surfacing of an unexpected causal factor. Supervisors and instructors can probably give vivid examples from their own experiences to illustrate the folly of overconfidence in one's own causal inferences.

If a causal judgment seems quite satisfactory to a therapist, and colleagues can find no serious objections, the therapist still should continue to test the judgment against new evidence as it becomes available. Care should be taken to avoid overemphasizing evidence that confirms the causal theory or discounting conflicting evidence. The methods discussed above can be used to avoid these errors—for example, adding new evidence to balance sheets, graphic illustrations, or written explanations; testing the judgment for consistency with each alternative causal hypothesis.

Even if a causal judgment is correct, continued reevaluation is necessary, as the cause of a behavior problem can change over time. For example, a problem could be precipitated by one cause and maintained by another; or the problem could be maintained first by one cause and then by another. The same is true of the causes of desired behavior change. That is, a treatment strategy that is effective at one stage of therapy may need to be replaced at a later stage. So ongoing evaluation of causal judgments is a habit that should be firmly established.

Summary and Concluding Comments

In this chapter we have offered suggestions for reducing biases in clinical causal judgments, suggestions particularly designed to help clinicians become more aware of potential sources of bias and to acquire bias-reducing thinking habits. We first discussed both general sources of bias in causal reasoning and sources of bias specific to clinical practice. Then we described several bias-reducing procedures and exercises applicable to the various stages of causal inference: gathering information, determining causal relations, and evaluating causal judgments. We suggest that clinicians go beyond the present discussion to look for other potential sources of bias and to invent additional bias-reducing techniques.

We realize that use of the methods we have suggested may seem a bit excessive. Can clinicians really be expected to devote so much time to every causal judgment? Considering the consequences of erroneous judgments, we believe they should. Causal inference errors can decrease the probability of discerning true causal relations and can lead to the expenditure of much time and effort on ineffective interventions. Ultimately, such errors can lower therapy success rates. We believe the solution is extensive practice with methods such as these, so that the principles underlying them become internalized and resistance to biases becomes habitual. With practice, less biased causal judgments can become increasingly cost-effective.

Unfortunately, the efficacy of our suggestions has not been empirically tested in clinical settings. However, the suggestions are consistent with research findings about bias in causal reasoning. Clearly,

more communication between clinicians and researchers is needed. Research in clinical settings could enhance our understanding of causal reasoning problems and provide practitioners with improved methods for handling complex causal judgments.

References

- Anderson, C. A. (1982). Inoculation and counterexplanation: Debiasing techniques in the perseverance of social theories. *Social Cognition, 1*, 126–139.
- . (1983a). Motivational and performance deficits in interpersonal settings: The effect of attributional style. *Journal of Personality and Social Psychology, 45*, 1136–1147.
- . (1983b). The causal structure of situations: The generation of plausible causal attributions as a function of type of event situation. *Journal of Experimental Social Psychology, 19*, 185–203.
- . (1983c). Imagination and expectation: The effect of imagining behavioral scripts on personal intentions. *Journal of Personality and Social Psychology, 45*, 293–305.
- . (1983d). Abstract and concrete data in the perseverance of social theories: When weak data lead to unshakeable beliefs. *Journal of Experimental Social Psychology, 19*, 93–108.
- . (1985). Actor and observer attributions for different types of situations: Causal structure effects, individual differences, and the dimensionality of causes. *Social Cognition, 3*, 323–340.
- Anderson, C. A., & Godfrey, S. (in press). Thoughts about actions: The effects of specificity and availability of imagined behavioral scripts on expectations about oneself and others. *Social Cognition*.
- Anderson, C. A., & Jennings, D. L. (1980). When experiences of failure promote expectations of success: The impact of attributing failure to ineffective strategies. *Journal of Personality, 48*, 393–407.
- Anderson, C. A., Jennings, D. L., & Arnoult, L. H. (1987). *The validity and utility of the attributional style construct at a moderate level of specificity*. Unpublished manuscript.
- Anderson, C. A., & Kellam, K. L. (Manuscript in preparation). *Hypothetical explanation of social theories and evaluation of new data*.
- Anderson, C. A., Lepper, M. R., & Ross, L. (1980). The perseverance of social theories: The role of explanation in the persistence of discredited information. *Journal of Personality and Social Psychology, 39*, 1037–1049.
- Anderson, C. A., New, B. L., & Speer, J. R. (1985). Argument availability as a mediator of social theory perseverance. *Social Cognition, 3*, 235–249.
- Anderson, C. A., & Sechler, E. S. (1986). Effects of explanation and counterexplanation on the development and use of social theories. *Journal of Personality and Social Psychology, 50*, 24–34.
- Anderson, C. A., & Slusher, M. P. (1986). Relocating motivational effects: A synthesis of cognitive and motivational effects on attributions for success and failure. *Social Cognition, 4*, 270–292.

- Arkes, H. R. (1981). Impediments to accurate clinical judgment and possible ways to minimize their impact. *Journal of Consulting and Clinical Psychology, 49*, 323-330.
- Borgida, E., & Nisbett, R. (1977). The differential impact of abstract vs. concrete information on decisions. *Journal of Applied Social Psychology, 7*, 258-271.
- Cantor, N., Smith, E., French, R., & Mezzich, J. (1980). Psychiatric diagnosis as prototype categorization. *Journal of Abnormal Psychology, 80*, 181-193.
- Carroll, J. G. (1978). The effect of imagining an event on expectations for the event: An interpretation in terms of the availability heuristic. *Journal of Experimental Social Psychology, 14*, 88-96.
- Chamberlin, T. C. (1897). Studies for students. *Journal of Geology, 5*, 837-848.
- Chapman, L. J., & Chapman, J. P. (1967). Genesis of popular but erroneous psychodiagnostic observations. *Journal of Abnormal Psychology, 72*, 193-204.
- _____. (1969). Illusory correlations as an obstacle to the use of valid psychodiagnostic signs. *Journal of Abnormal Psychology, 74*, 271-280.
- D'Agostino, P. R., O'Neill, B. J., & Paivio, A. (1977). Memory for pictures and words as a function of level of processing: Depth or dual coding? *Memory & Cognition, 5*, 252-256.
- Ellis, A. (1977). The basic clinical theory of rational-emotive therapy. In A. Ellis & R. Grieger (Eds.), *Handbook of rational-emotive therapy*. New York: Springer.
- Elms, A. C. (1967). Role playing, incentive, and dissonance. *Psychological Bulletin, 68*, 132-148.
- Feather, N. T., & Simon, J. G. (1971a). Attribution of responsibility and valence of outcome in relation to initial confidence and success and failure of self and others. *Journal of Personality and Social Psychology, 18*, 173-188.
- _____. (1971b). Causal attributions for success and failure in relation to expectations of success based upon selective or manipulative control. *Journal of Personality, 39*, 527-541.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Greenwald, A. G. (1968). Cognitive learning, cognitive response to persuasion, and attitude change. In A. G. Greenwald, T. C. Brock, & T. M. Ostrom (Eds.), *Psychological foundations of attitudes*. New York: Academic Press.
- _____. (1969). The open-mindedness of the counterattitudinal role player. *Journal of Experimental Social Psychology, 5*, 375-388.
- _____. (1970). When does role playing produce attitude change? Toward an answer. *Journal of Personality and Social Psychology, 16*, 214-219.
- Greenwald, A. G., & Albert, R. D. (1986). Acceptance and recall of improvised arguments. *Journal of Personality and Social Psychology, 8*, 31-34.
- Greenwald, A. G., Pratkanis, A. R., Leippe, M. R., & Baumgardner, M. H. (1986). Under what conditions does theory obstruct research progress? *Psychological Review, 93*, 216-229.
- Gregory, W. L., Cialdini, R. B., & Carpenter, K. M. (1982). Self-relevant scenarios as mediators of likelihood estimates and compliance: Does imagining make it so? *Journal of Personality and Social Psychology, 43*, 89-99.
- Harvey, J. H., Ickes, W. J., & Kidd, R. F. (Eds.) (1976). *New directions in attribution research* (Vol. 1). Hillsdale, NJ: Erlbaum.
- _____. (Eds.) (1978). *New directions in attribution research* (Vol. 2). Hillsdale, NJ: Erlbaum.
- _____. (Eds.) (1981). *New directions in attribution research* (Vol. 3). Hillsdale, NJ: Erlbaum.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.
- Horowitz, L. M., Post, D. L., French, R., Wallis, K. D., & Siegelman, E. Y. (1981). The prototype as a construct in abnormal psychology: 2. Clarifying disagreements in psychiatric judgments. *Journal of Abnormal Psychology, 90*, 575-585.
- Janis, I. L. (1972). *Victims of groupthink*. Boston: Houghton Mifflin.
- Janis, I. L., & Mann, L. (1965). Effectiveness of emotional role-playing in modifying smoking habits and attitudes. *Journal of Experimental Research in Personality, 1*, 84-90.
- Jennings, D. L. (1980). Effects of attributing failure to ineffective strategies. *Dissertation Abstracts International, 408*, 5461B. (University Microfilms No. 80-11, 654)
- Jones, E. E., & Davis, K. E. (1965). From acts to dispositions. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2). New York: Academic Press.
- Jones, E. E., & Nisbett, R. E. (1972). The actor and the observer: Divergent perceptions of the causes of behavior. In E. E. Jones, D. E. Kanouse, H. H. Kelley, R. E. Nisbett, S. Valins, & B. Weiner (Eds.), *Attribution: Perceiving the causes of behavior*. Morristown, NJ: General Learning Press.
- Kadushin, C. (1969). *Why people go to psychiatrists*. New York: Atherton.
- Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review, 80*, 237-251.
- Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska Symposium on Motivation*. Lincoln: University of Nebraska Press.
- Kiesler, C. A., Nisbett, R. E., & Zanna, M. P. (1969). On inferring one's beliefs from one's behavior. *Journal of Personality and Social Psychology, 11*, 321-327.
- Koriat, A., Lichtenstein, S., & Fischhoff, B. (1980). Reasons for confidence. *Journal of Experimental Psychology: Human Learning and Memory, 6*, 107-118.
- Kruglanski, A. W. (1980). Lay epistemo-logic—process and contents: Another look at attribution theory. *Psychological Review, 87*, 70-87.
- Lazarus, A. A. (1976). Multimodal behavior therapy: Treating the BASIC ID. In A. A. Lazarus (Ed.), *Multimodal behavior therapy*. New York: Springer.
- Lord, C. G., Lepper, M. R., & Preston, E. (1984). Considering the opposite: A corrective strategy for social judgment. *Journal of Personality and Social Psychology, 47*, 1231-1243.
- Lord, C., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology, 37*, 2098-2109.
- McGuire, W. J. (1968). The nature of attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (Vol. 3). Reading, MA: Addison-Wesley.
- Monson, T. C., & Snyder, M. (1977). Actors, observers, and the attribution process: Toward a reconceptualization. *Journal of Experimental Social Psychology, 13*, 89-111.

- Nisbett, R., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice-Hall.
- Richardson, J. T. E. (1974). Imagery and free recall. *Journal of Verbal Learning and Verbal Behavior*, *13*, 709-713.
- Ross, L., & Anderson, C. A. (1982). Shortcomings in the attribution process: On the origins and maintenance of erroneous social assessments. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases*. New York: Cambridge University Press.
- Ross, L., Lepper, M. R., & Hubbard, M. (1975). Perseverance in self perception and social perception: Biased attributional processes in the debriefing paradigm. *Journal of Personality and Social Psychology*, *32*, 880-892.
- Shaklee, H., & Fischhoff, B. (1982). Strategies of information search in causal analysis. *Memory and Cognition*, *10*, 520-530.
- Sherman, R. T., & Anderson, C. A. (in press). Decreasing premature termination from psychotherapy. *Journal of Social and Clinical Psychology*.
- Sherman, S. J., Cialdini, R. B., Schwartzman, D. F., & Reynolds, K. (1985). Imagining can heighten or lower the perceived likelihood of contracting a disease: The mediating effect of ease of imagery. *Personality and Social Psychology Bulletin*, *11*, 118-127.
- Snyder, M., & Swann, W. B. (1978). Behavioral confirmation in social interaction: From social perception to social reality. *Journal of Experimental Social Psychology*, *14*, 148-162.
- Slovic, P., & Fischhoff, B. (1977). On the psychology of experimental surprises. *Journal of Experimental Psychology: Human Perception and Performance*, *3*, 544-551.
- Slusher, M. P., & Anderson, C. A. (1987). When reality monitoring fails: The role of imagination in stereotype maintenance. *Journal of Personality and Social Psychology*, *52*, 653-662.
- Temerlin, M. K. (1968). Suggestion effects in psychiatric diagnosis. *Journal of Nervous and Mental Disease*, *147*, 349-353.
- Weiner, B. (1974). *Achievement motivation and attribution theory*. Morristown, NJ: General Learning Press.
- _____. (1982). The emotional consequences of causal attributions. In M. S. Clark & S. T. Fiske (Eds.), *Affect and cognition: The 17th Annual Carnegie Symposium on Cognition*. Hillsdale, NJ: Erlbaum.
- _____. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, *92*, 548-573.
- Weiner, B., & Handel, S. (1985). Anticipated emotional consequences of causal communications and reported communication strategy. *Developmental Psychology*, *21*, 102-107.
- Weiner, B., Russell, D., & Lerman, D. (1979). The cognition-emotion process in achievement-related contexts. *Journal of Personality and Social Psychology*, *37*, 1211-1220.