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CHAPTER 2

BELIEF PERSEVERANCE AND SELF-DEFEATING BEHAVIOR

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At first glance, self-defeating behaviors predicated on honestly (but incorrectly) held beliefs would seem readily amenable to change. Surely in most cases, information is available to challenge these beliefs, set the record straight, and enhance the possibility of more adaptive behaviors. Yet both experience and research suggest that this optimistic appraisal is far too simplistic. The gap between information *received* and information *perceived* is filled with a surprising array of biases and errors which ultimately weaken the impact of new information on current beliefs. In this chapter, we explore ways in which beliefs persist in light of new information and in spite of the discrediting of old information. We see how people often are insensitive to information in the environment, yet ironically, they perceive evidence to support their beliefs where none actually exists. We examine how beliefs can take on a life of their own, no longer in need of the evidence that gave them birth. Throughout the chapter we relate these processes to such problems as depression and loneliness, problems in which the persistence of maladaptive beliefs plays an integral role. We also comment on how an understanding of these issues suggests ways in which incorrect beliefs and self-defeating behaviors may be overcome.

TENACIOUS BELIEFS AND SELF-DEFEATING BEHAVIORS

BELIEFS ABOUT ONESELF

At the outset, some examples may help delineate areas in which incorrect beliefs, if persistent in the face of challenge, could lead to self-defeating be-

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haviors. Most obvious among these are various beliefs about the self, ranging from beliefs about personal competence to beliefs about one's physiological functioning. For example, John is assured by the "Famous Writers" correspondence school that he has great potential as a writer, only to find that friends who have answered the same advertisement have all received the same evaluation. This should suggest to John that the original information was of little value, yet John persists in believing that the evaluation is accurate in his case and embarks on a writing career destined for failure (after Ross, Lepper, & Hubbard, 1975). If this example seems divorced from common experience, consider the effects of evaluations that occur every day within our educational system. Feedback in schools is inherently focused on the perceived competence of the individual students. Given new information to learn or a novel task to master, a student will acquire a sense of competence (or lack thereof) based on experiences of success or failure. The fact that performance may reflect the quality of instruction as much as or more than personal ability is often overlooked. Rather, students who receive substandard instruction and experience subsequent failure often persist in believing in their lack of ability. This effect is so strong that it occurs even in those rare cases where the students are fully aware that they received inadequate training (Lepper, Ross, & Lau, 1986). Consequently, these students may show a decreased sense of self-efficacy (see Bandura, 1977), demonstrate decreased motivation, and never display or utilize the true ability they possess.

People often hold irrational beliefs about themselves or about the way their activities fit into the context of the social environment (Ellis, 1977). Such beliefs have been related to psychological conditions associated with self-defeating behaviors. For example, Anderson and Arnoult (1989) found that irrational beliefs were positively correlated with negative affect and depression. A person who believes that "In order to be truly happy, I must prove that I am thoroughly adequate and achieving in most things I attempt" may find it difficult to simultaneously believe that "I am a happy person" or even that "I can become a happy person." It may become a therapist's task to change the initial belief about the conditions necessary for personal happiness. Thus, a change in self-defeating behaviors associated with depression is often predicated on first changing a persistent maladaptive belief.

Beliefs about personal competence affect behavior in many realms of activity. For example, some people have severe doubts about their social abilities. As a consequence, they may avoid interpersonal interactions and develop a variety of interpersonal problems such as loneliness, shyness, and depression (Anderson & Arnoult, 1985a, 1985b; Anderson, Horowitz, & French, 1983; Horowitz, French, & Anderson, 1982). These problems occur even in people who, when forced to interact under various laboratory conditions, show no true social inability (Anderson, 1983c; Brodt & Zimbardo, 1981). Research relating perseverant beliefs to loneliness, shyness, and depression are examined in more detail later in this chapter.

Incorrect perceptions of superior skills also may lead to maladaptive behaviors. Business managers with inflated self-assessments may fail to request or properly use needed assistance on a given problem, resulting in even larger

problems. Witness the decision errors made by NASA managers leading up to the destruction of the space shuttle *Challenger* and the deaths of seven crew members. The expertise for the proper decision was available but ignored (several engineers on the project strongly recommended against a launch attempt in the abnormally cold weather).

Less dramatic but more representative examples abound. In our own experience we have witnessed medical researchers who, in their ignorance of experimental methodology and their firm belief in their own skills, have wasted countless thousands of dollars and innumerable man-hours on valueless research. One of the present authors, while working on a bridge construction crew one summer, was almost drowned in an accident caused by a crane operator who overestimated his ability to maneuver his equipment.

Perceptions of ability are not, however, the only self-relevant beliefs that can lead to maladaptive behaviors. Erroneous beliefs about physiological functioning can lead to inappropriate actions as well. For example, this has been demonstrated among insomniacs concerned with the effects of exercise prior to bedtime. Objective measures show that the stimulation of exercise delays the onset of sleep. However, many insomniacs subjectively feel that the exhaustion associated with exercise actually helps them to sleep (Freedman & Papsdorf, 1976), and they therefore continue to engage in such self-defeating activity.

In sum, erroneous beliefs about oneself can lead to self-defeating behaviors in any domain of human enterprise. The resulting mistakes often injure others as well as oneself. Factors which perpetuate such maladaptive self-beliefs thus exacerbate the problem.

Beliefs about Someone Else

All too often, incorrect beliefs about other people (social impressions) also lead to self-defeating behaviors. An example is the businessman whose stereotype of Hispanics keeps him from hiring the most qualified applicant for a job—just because the person is Hispanic. Or consider the often ill-considered actions of a would-be lover who misattributes the friendly responses of his intended to more romantic motives, even after repeated denials. The growing awareness of so-called date rape in our society points to one serious consequence of such a scenario. Clearly, the attributions we make for the behaviors of another person can affect our own behavior toward that person, and mistaken attributions can lead to inappropriate reactions.

Our beliefs about others may also affect our motivation to emulate positive behavior. For example, a friend may succeed in making many new friends at a party while our own attempts meet with less success. Was our friend born with a magnetic personality or did she just use the right strategy to meet new people at the party? The latter attribution would suggest that we could also develop a successful strategy. The former attribution, however, could lead to self-defeating behaviors (e.g., giving up), because we have decided that the route to making new friends is unattainable.

Research on the (occasionally) long-lasting effects of first impressions also

demonstrates self-defeating consequences of perseverant social impressions. Initial impressions bias interactions and judgments in a wide variety of contexts, ranging from formal job interviews (Dipboye & Macan, 1987) to informal "get acquainted" sessions (Snyder & Swann, 1978; Snyder, Tanke, & Berscheid, 1977).

Kelley's (1950) classic study of students' responses to a new instructor described as "warm" or "cold" reminds us of the self-defeating behaviors of a small but visible minority of students in our introductory classes. These students start the semester with the beliefs that psychology is simple and psychologists are stupid. This first impression, based on conversations with their advisors in the "real" sciences, leads to a variety of self-defeating behaviors including failure to study, failure to pay attention to lectures, and often failure of the class.

Initial impressions of another person may be based on limited exposure to that person or on reports from a mutual acquaintance. They also can be based on stereotypes about the person's social or racial class. Such stereotypic beliefs are but one example of a third type of belief leading to unwarranted and self-defeating behavior, namely, social theories.

Social Theories

Social theories are our beliefs about the relations between variables in the social environment. They are by nature causal belief systems; that is, social theories are beliefs about how, why, and in what way the variables in question are related. Thus, stereotypes are not simple listings of features typically associated with a given group but are in fact beliefs about features that are somehow causally related to the group (see Anderson & Sedikides, 1989). Other types of social theories also causally link variables in the social domain. For instance, beliefs relating personality traits of job incumbents to job performance are social theories if the traits are seen as being causally relevant to job performance (e.g., Anderson & Sechler, 1986). Irrational beliefs (e.g., Ellis, 1977) also can take the form of social theories, as when a person believes that only highly talented individuals can get the deepest kind of satisfaction out of their work. As noted earlier, beliefs such as these have been linked with depression and negative affect (Anderson & Arnoult, 1989). Other examples of self-defeating social theories might be beliefs that nice people come in last, anyone who dates is only interested in sex, or love can only lead to heartbreak.

Many judgments are made on the basis of social theories. Nuclear arms negotiations are heavily based on beliefs about how the various sides would behave under different military scenarios. Politicians make decisions regarding a host of matters incorporating social theories about economic policy and inflation, welfare programs and poverty, or education and productivity. When these people cling to outdated theories or poorly justified beliefs, they may jeopardize not only their own careers but the welfare of society as well. Even in the purportedly impartial atmosphere of the courtroom, social theories play an important role, as when a juror develops a belief concerning the guilt or innocence of the defendant based on a social theory relating the defendant's social category (e.g., race, sex, occupation) to the type of crime under investigation. Certainly, social

theories play a large role in decisions about intimate relationships. A person who believes that love can only result in pain will most likely be unwilling to take the risks associated with intimacy.

A final example may help to focus on the important relation between incorrect beliefs, the perseverance of these beliefs, and the self-defeating behaviors that may result. In the United States, early cases of Acquired Immune Deficiency Syndrome (AIDS) were found primarily among gay men, drug abusers, and Haitians. This led the government to designate these as high-risk groups, with the media encouraging a popular mislabeling of the syndrome as a gay disease. As a result, many people came to believe that they would risk their health by any association with gay men, however casual. At the same time, sexual activity among nongay individuals was considered risk-free (at least for AIDS). However, with the discovery of the viral nature of AIDS, these beliefs were discredited. Medical concern shifted away from high-risk groups to emphasize the dangers of high-risk activities, activities that could be engaged in by anyone. Yet, indications are that many nongay individuals continue to believe that they are not at risk for AIDS, and so they continue to engage in risky activities. For a significant number of these people, the self-defeat associated with this particular perseverant belief may be final.

These examples provide an indication of the ubiquity of erroneous beliefs and self-defeating behavior and hint at the important role played by belief perseverance phenomena. People's beliefs are frequently based on faulty teachings or faulty evidence (or the faulty assimilation of valid evidence), or they may be grounded in circumstances that change, making previously reasonable beliefs reasonable no longer. Such experiences have stimulated a variety of questions which researchers have attempted to answer in recent years. What processes lead to the formation of erroneous beliefs? What are the characteristics of some beliefs that make them so resistant to change? How is new information processed in light of current beliefs? What is the continuing influence of discredited information? How can educational efforts challenge deeply ingrained beliefs that lead to maladaptive behaviors? These and related questions are being addressed by social scientists in both the theoretical and applied domains. In the next section we examine some of the origins of incorrect beliefs.

THE ORIGINS OF INCORRECT BELIEFS

Formal and Informal Socialization

Beliefs can arise from two conceptually distinct sources. First, there are the beliefs that we are taught, either formally, as in a classroom, or more informally through socialization into our culture. These beliefs come to us essentially prepackaged, and account for a large portion of our knowledge about the world around us. For example, the 4-year-old son of the second author already has acquired a fairly complex set of beliefs about sex roles. He knows that boys grow into men, whereas girls grow into women. He knows that only a woman can have

a baby, but that it takes both a man and a woman to make a baby. These ideas relating gender to particular features were formally taught. He also seems to be learning traditional sex-role stereotypes concerning employment work and household work. These ideas apparently have been acquired informally via peers at a day-care center. Our point here is that beliefs are simply and continuously acquired by relatively mundane socialization or learning processes. Many such beliefs will be incorrect in some way; some will be maladaptive.

Personal Experience and Observation

The Naive Psychologist

The second, and often more interesting, source for the formation of beliefs is personal experience and observation. Connecting the observation of objective facts with subjective beliefs is the fallible process of human inference (Kahneman, Slovic, & Tversky, 1982; Nisbett & Ross, 1980). This process represents the "naive psychology" (Heider, 1958) of ordinary people as they attempt to make sense of the social environment, deriving lawful relations among social variables and trying to explain the causes of events. In attempting to answer these "what" and "why" questions, the naive psychologist uses methods quite analogous to those of the professional scientist (Ross & Anderson, 1982). As with all scientists, the naive psychologist is guided by implicit assumptions about the nature of the subject at hand, in this case human nature and human behavior. For example, people are generally "dispositionists," believing that others' behaviors result from some internal motives or characteristics. This tendency can be seen in the theorizing of professional research psychologists as well (cf. Anderson & Slusher, 1986; Miller & Ross, 1975).

To test and build upon these assumptions, the naive psychologist uses data extracted from the environment, either directly from personal experience or more indirectly through communication with others or through the mass media. Then these data must be coded and stored in some way that is retrievable for use. Finally, just as the professional scientist must combine assumptions with data to produce a meaningful yet parsimonious picture of the phenomenon under study, the naive psychologist must use techniques to summarize, analyze, and interpret the data to achieve a better understanding. The rewards of this process are clear: people do not need to react to each event in their lives as wholly new and as unrelated to past experiences. Instead, people can predict events, understand the causes and meanings of events, and integrate events into consistent patterns of related incidents. When accurate, this process allows the individual to master the social environment. However, when systematic biases exist at any phase of the inferential process, serious errors may arise. Thus, inaccurate assumptions, biased data (or biased perception of data), or inappropriate summation and interpretation can ultimately result in improper inferences and beliefs. As we see later, the inferential process also contributes to the persistence of these beliefs.

Errors and Biases in the Attribution Process

The process by which people attempt to understand the causes and implications of events in their environment, and thus develop beliefs about themselves and their environment, is the attribution process (Heider, 1958; Jones & Davis, 1965; Kelly, 1967, 1973). Although the process generally works well, a number of biases have been identified that frequently give rise to inaccurate beliefs. The most frequently cited bias is referred to as the *fundamental attribution error*, which is the tendency for attributors to overestimate dispositional factors and underestimate situational factors in the control of behavior (Heider, 1958; see Ross & Anderson, 1982, for a review). This bias is evident when people draw "correspondent" personal inferences about actors who respond to obvious situational influences. For example, when Jones and Harris (1967) required speakers to voice pro-Castro remarks, observers assumed that some correspondence existed between the remarks and the speakers' private opinions, even though they were well aware that the speakers had no choice of what to say.

A second common bias in the attribution process is known as the salience, or availability, bias (see reviews by Ross & Anderson, 1982; Taylor & Fiske, 1978). Any aspect of the environment that is especially apparent to the attributor is typically given more weight in the causal attribution. For example, an actor who is distinctive within a group for some reason (race, sex, dress, lighting, etc.) will be seen as particularly responsible for any outcome to which he or she contributed. This bias also appears to account for a discrepancy often found in the attributions assigned by actors and observers (Jones & Nisbett, 1972). Actors frequently attribute events to the environment, since they are focused on the environment, whereas observers attribute the same events to dispositional features of the actor, toward whom the observer is focused.

Other attributionally relevant biases have been identified, but further discussion is beyond the scope of this chapter. Our point here is that erroneous beliefs arise from many sources, including socialization and attributional processing. Once inappropriate beliefs do arise through these and other biases in the attributional process, they often are stubbornly resistant to change. The next section reviews some of the processes responsible for belief perseverance.

THE PERSEVERANCE OF BELIEFS

Once beliefs are established, it often seems that they are inordinately resistant to change. We have all been faced with the friend who defies our best efforts at "reeducation," and even among scientists there is a tendency to defend an established theory in light of considerable discrepant evidence. Often this is completely appropriate. Well-established theories, grounded in valid evidence, deserve to be retained when challenged with evidence of uncertain validity. A pregnant teenager's disclaimer about sexual activity and a television evangelist's claims of raising the dead should not change our beliefs about birth and death, respectively. However, circumstances do arise which seem to demand at least some modifications to existing beliefs. But what modifications are appropriate?

Do people in fact make the appropriate changes? If not, what mechanisms allow a person to reconcile an old belief with new and inconsistent data?

Several major reviews have discussed a broad spectrum of research related to belief perseverance (Jelalian & Miller, 1984; Ross & Anderson, 1982; Ross & Lepper, 1980). These reviews have examined such important issues as normativeness (how much beliefs should change), the proper blend of theory-driven thought versus empiricism, and the important positive benefits of inferential processing in day-to-day thought. The current review takes a more applied approach. In keeping with our emphasis on relating belief perseverance to self-defeating behaviors, we posit a very particular situation at the outset and review the literature as it relates to this circumstance. The situation we wish to consider is one in which a maladaptive self-defeating behavior is tied to some particular belief (or perhaps to some constellation of beliefs). Strictly speaking, it is not necessarily important to know the accuracy of this belief. In this context, it may be more appropriate to talk about adaptive and maladaptive beliefs, rather than correct and incorrect beliefs. What *is* assumed is that some agent (e.g., the self, a therapist, a friend) has determined this belief to be the basis for maladaptive behavior and wishes to effect a change. We examine four types of challenges that may be introduced to produce this change and what processes affect the likelihood of success.

Challenging the Formative Evidence

The first challenge questions the validity or relevance of evidence that originally led to or helped to bolster the belief. For example, a singer may believe that her talent is inadequate and her career is hopeless after failure at an important audition. To challenge this, her teacher may point out the residual effects of a recent cold, or the immense competition in this particular audition, or the fact that this was an opera audition and the singer's training and expertise point to Broadway. Each of these arguments would tend to discredit the results of the audition as being diagnostic of the singer's future career. What are the chances that these arguments will change the singer's beliefs? Likewise, a therapist may be faced with a depressed client suffering acutely from the effects of rejection (in romance, in employment, in family relationships, etc.). If the therapist points out extenuating circumstances that suggest the rejection is not due to characteristics of the client, what are the chances that the therapist can change the client's beliefs? A considerable amount of research has addressed the issue of belief perseverance in the wake of discredited evidence. Two broad categories of beliefs have been examined in this context—specific impressions about a person (self or someone else) and more general social theories.

Self- and Social Impressions

Interestingly, the earliest research on this issue was related to maladaptive self-beliefs arising from psychological research itself. Walster, Berscheid, Abrahams, and Aronson (1967) were concerned about lasting effects of deception in psychology experiments. Of particular concern were those experiments in

which fictitious feedback was employed to manipulate subjects' self-esteem or perceived abilities, often lowering self-esteem in the process or leading the subjects to feel inadequate in some way. They questioned whether the standard debriefing, in which subjects were simply informed about the fictitious nature of their feedback, was adequate to return subjects to the preexperimental state. Walster *et al.* (1967) suggested such a debriefing would not eliminate the self-impressions created by the feedback, and that this effect might arise because the false feedback would lead subjects to recall other *consistent* information from their past, but not corresponding *inconsistent* information. To test this hypothesis, Walster *et al.* provided subjects with false feedback regarding their social skills and measured the subjects' perceptions of their sociability following a debriefing in which the false nature of the feedback was disclosed. The results of their study were both clear and disturbing; the effects of the false feedback lingered after the debriefing. Subjects who were given favorable sociability feedback rated themselves significantly more sociable than subjects given the unfavorable feedback. Clearly, the complete discrediting of the initial evidence did not adequately change the beliefs associated with this evidence.

Valins (1974) found that beliefs arising from false physiological feedback could be resistant to change as well. Subjects were exposed to what they believed to be their heart-rate reactions in response to viewing photographs of nudes. The heart-rate reactions were actually manipulated experimentally and were designed to indicate increased arousal in response to particular pictures. Later in the experiment some subjects were informed of the deception in a debriefing. But the false feedback significantly influenced reported attitudes toward the various nudes, regardless of whether the subjects were debriefed or not. Valins suggested that subjects were engaging in a self-persuasion process, wherein they invested considerable cognitive activity to convince themselves that a given nude was attractive or not in accordance with their alleged physiological reaction. Once persuaded, they persisted in these attitudes regardless of the validity of the feedback.

In two experiments, Ross, Lepper, and Hubbard (1975) extended the finding that experimentally induced perceptions of ability could persevere in the aftermath of a thorough debriefing. Whereas the Walster *et al.* (1967) study had been fairly narrowly focused on the adequacy of experimental debriefing procedures, Ross *et al.* were interested in a more general question. They wanted to know whether social perceptions as well as self-perceptions would be subject to a perseverance effect when evidence supporting the initial perception was completely discredited. They utilized a novel task requiring subjects to attempt to discern authentic suicide notes from fabricated suicide notes. Feedback was manipulated to indicate that a given subject had either high or low ability on this task. In Experiment 1, subjects were given a standard debriefing, informing them of the false nature of the feedback. Nevertheless, the feedback continued to affect subjects' judgments, influencing their estimates of both past and future performance as well as their performance self-estimates relative to the average student. In Experiment 2, some subjects observed as others performed the same novel task and received the same debriefing. Perseverance effects were observed

for both the actors and observers, demonstrating that the phenomenon is not restricted to self-perception alone; that is, not only did the actor subjects display self-judgments consistent with the discredited feedback, but the observer subjects showed the same distorted judgments of the actors. In another condition of this experiment, subjects were given a "process" debriefing, in which the experimenter attempted to explain that the study dealt with the perseverance of impressions, described the phenomenon, and speculated on some of the processes thought to underlie the effect. In this condition, perseverance occurred only for the observers, with the process debriefing apparently being successful in neutralizing the beliefs of the actors.

A much more recent study demonstrated perseverance of self-impressions in a setting completely removed from the psychology laboratory. Lepper, Ross, and Lau (1986) showed high school students instructional films purportedly designed to help them solve a novel class of mathematical problems. Half of the students saw a film that accomplished exactly what it was purported to do. These students were quite successful in solving the problems after viewing the film. However, the other students were shown a film that was more confusing than instructional, and as a result these students failed to solve the problems. Students naturally felt that their performance was reflective of their ability after their initial success or failure. The evidence for this belief was discredited, however, when students were allowed to see the opposite film. This experience made it clear to all the students that their performance, good or bad, was more a result of adequate or inadequate instruction than of their personal abilities. Nevertheless, students continued to believe that they possessed either high or low ability, depending on their initial experience of success or failure, even 3 weeks after the exercise. Motivation levels with regard to this particular type of problem also mirrored the self-impressions of ability.

Manipulations in which initial information is discredited do sometimes influence impression judgments. But the amount and direction of the influence varies as a function of numerous variables, such as the timing of the discrediting, type of evidence being discredited, and the type of judgment (e.g., likeability ratings versus trait ratings) being made (for examples, see Thompson, Fong, & Rosenhan, 1981; Wyer & Budesheim, 1987; Wyer & Unversagt, 1985).

Social Theories

Although specific impressions about oneself or some other person are important in the development of self-defeating behaviors, they certainly are not the only beliefs that are relevant. Consider, for example, the social theories held by many rapists. Research (e.g., Burt, 1980; Koss, Leonard, Beezley, & Oros, 1985; Malamuth, 1986; Scully & Marolla, 1984) has shown that these people tend to hold a variety of "rape myth" beliefs and attitudes which function like social theories. These beliefs may arise from a variety of sources, such as general cultural beliefs, certain films, books, and "testimony" from peers. The evidential base for these beliefs can be challenged (e.g., the films are only make-believe). Given that there is little real supportive evidence for these social theories, one might expect evidential challenges to be particularly effective. What do we know about the persistence of social theories when the evidence on which they are based is challenged? As in the case of self- and social impressions, social theories frequently persist even in the face of logically overwhelming evidence.

Anderson, Lepper, and Ross (1980) extended the study of the perseverance effect into the realm of social theories, using the same debriefing paradigm used by others in the study of self- and social impressions. In these studies, however, subjects were not led to believe something about themselves or a particular other person. Rather, they were given evidence suggestive of a particular social theory which they were unlikely to have thought about previously. They were allowed to use this evidence to formulate a belief about the relation between two variables before they were debriefed about the fictitious nature of the original evidence. Postdebriefing beliefs were evaluated for evidence of perseverance.

The particular task chosen by Anderson *et al.* (1980) was designed to be an especially stringent test of the perseverance effect. The initial evidence presented was minimal and logically inadequate, just the kind of evidence likely to lead to ill-founded beliefs often challenged in everyday experience. In particular, subjects were led to believe that either a positive or a negative relation existed between a firefighter trainee's preference for risky versus conservative choices and his later success as a firefighter. These beliefs were instilled on the minimal evidence provided by two purported case studies. In Experiment 1, half of the subjects were debriefed about the fictitious nature of the case studies, whereas the other half received no such debriefing. The results showed that subjects were surprisingly willing to draw conclusions about the general relation between risk preference and firefighter ability on the basis of the minimal evidence provided. In the nondebriefing conditions, final beliefs strongly differed in the positive and negative conditions, with beliefs in each condition consistent with the appropriate case studies. More importantly, beliefs in the debriefing conditions showed this same pattern. Indeed, subjects who were explicitly informed that the initial data were completely bogus held beliefs that were only slightly less extreme than the corresponding beliefs of subjects who never were told that the theory induction examples were fictitious.

There are other studies on the effects of challenges to formative evidence for self- and social impressions and social theories. Overall these studies confirm the picture sketched out above. Specifically, challenging the formative evidence often has little effect on people's beliefs. What other strategy might one try to change people's maladaptive beliefs?

Presenting New Evidence

Another strategy that one might use to change a maladaptive belief is to present *new* evidence to oppose the belief. In the case of self-beliefs, evidence which contradicts the self-impression should correct the mistaken belief. Social impressions and social theories as well should be responsive to contradictory data. The difficulties in producing changes in beliefs about others or about oneself have been documented in countless studies of attitude change and thera-

peutic interventions, and so are not discussed here. A brief summary of this work is, simply, that presenting new evidence to change such beliefs often meets with failure.

Most of that research, though, is only tangentially relevant to the question of effectiveness of new evidence in changing social theories. In the public forum, this is perhaps the most common method employed, particularly as opposing sides debate controversial issues, vying for public support. Logically, as evidence is accumulated supporting one side, the other side, or both sides of an issue, beliefs of those with initially extreme positions should converge on the position supported by the evidence. Confidence in the initial belief should be undermined by the presentation of contradictory evidence. As an example, consider beliefs about the health risks of smoking tobacco. Certainly in the view of the American Cancer Society, smoking is considered a self-defeating behavior, yet many smokers apparently believe that the risks have been exaggerated. Suppose that a smoker believes that smoking is not particularly harmful, but a friend decides to try to change that belief. To accomplish this, the friend presents the smoker with the results of studies demonstrating the various dangers that smoking may pose. In response, the smoker seeks out the latest research by the Tobacco Institute indicating that smoking is not the cause of many of these health problems. Assuming that neither of these people is sufficiently knowledgeable to actually judge the merits of these opposing studies, what is likely to be the outcome of this exchange? Will the smoker become less certain that smoking is safe? Will the friend concede that maybe smoking isn't so bad after all?

Research conducted by Lord, Ross, and Lepper (1979) suggests that parties in a dispute such as this will not only persevere in their original beliefs but may come to believe them even more strongly. In the Lord *et al.* study, subjects were presented with two purportedly authentic research reports on the deterrent efficacy of capital punishment laws. Prior to seeing these reports, each subject had indicated either a strong belief that capital punishment was an effective deterrent to potential murderers or a strong belief that it was not. For each study, subjects were presented with both the method and the results of the research. One study was presented as a design in which murder rates in particular states were compared before and after the introduction or elimination of death penalty laws. The design of the other study involved a comparison across states, contrasting states with and without death penalty laws in a given period of time. Appropriate counterbalancing produced all the various combinations of original beliefs, research methods, and purported research results either supporting or rejecting the deterrent effects of the death penalty.

The results of the Lord *et al.* study reveal the dubious wisdom of trying to win a debate or change another person's theory by pitting one study against another. First, subjects were asked to evaluate the quality of the two studies. The evaluations showed that subjects did not rate the studies on the basis of methodological considerations, but rather on whether or not their findings agreed with the subjects' original beliefs. The supportive study was regarded as more convincing and better conducted than the opposing study. Furthermore, detailed descriptions of the studies (including discussion of shortcomings) were

not treated equally. The initial impact of a supportive result was not curtailed by further delving into the details of the study. However, when the results of a study opposed the original belief, the presentation of methodological details provided an opportunity to find even more flaws in the design, weakening the impact of the study even more. As a result of these perceptions, the overall impact of reading both studies was to *increase* the polarization of beliefs initially existing among the subjects.

Research in our own laboratory confirms that exposure to new evidence does not necessarily result in elimination of unwarranted beliefs. In one study (Anderson & Sechler, 1986, Experiment 3) subjects were led to believe that either a positive or a negative relation existed between a person's level of risk preference and his ability as a firefighter. The theory induction was accomplished simply by having subjects write out a hypothetical explanation for either a positive or negative relation. Later, subjects received purportedly real data which indicated that there is in fact no relation between the two variables. Logically, creating a hypothetical explanation for a particular theory should not lead to a belief in that theory. It did. Logically, such explanation-induced theories should not be able to survive presentation of new and contradictory evidence. They did. Three results of that study are particularly relevant here. First, subjects developed theories consistent with their assigned explanation task. Second, unlike the subjects of Lord *et al.* (1979), ours did not polarize when faced with new data; indeed, other measures yielded no evidence of biased evaluation of the new data. Instead, our subjects moderated their explanation-induced theories after seeing the new evidence. Third, exposure to the new evidence did not eliminate the differences in theories held by subjects who had explained opposite hypothetical relations; that is, the new data did not overcome the explanation-induced beliefs.

Consider what this might mean for a therapy client who is convinced that love must inevitably lead to heartbreak. To point out that half the marriages in our society lead to lifelong, fulfilling relationships (essentially neutral data) may not be very convincing. To the therapist, this may show that the cup is half-full, but to the client, this same cup may seem half-empty. Indeed, Lord's data suggest that the client will be suspicious of the apparently successful marriages.

Both of the studies above examined how social theories change (or fail to change) in response to exposure to new evidence that overall suggests no relation between the social variables. In a more recent study (Anderson & Kellam, 1988), we investigated the effects of exposure to new data which either clearly contradict or clearly support the person's initial theory. Subjects were randomly assigned to explain (hypothetically) either a positive or a negative relation between risk preference and firefighter ability. Later, they examined and evaluated a large set of scatterplots of risk scores and firefighter evaluation scores. The scatterplots showed either a strong positive or a strong negative relation. Subjects' social theories about the risk preference/firefighter ability relation were assessed both prior to the hypothetical explanation task and after viewing the scatterplots.

Two results are of interest. First, once again our subjects did not evaluate the new evidence in a biased way. Second, the new evidence did not completely

override subjects' explanation-induced social theories; that is, creating a purely hypothetical explanation for a randomly assigned social theory led to beliefs that could not be overridden by a large and clear set of relevant data. In sum, it has been shown that presenting new evidence has some impact on erroneous beliefs in some circumstances, but that even logically compelling evidence often fails to induce appropriate levels of belief change.

URGING OPEN-MINDED OBSERVATION

The next strategy that one might use to change a maladaptive belief is more indirect than the first two discussed. It involves encouraging a person to view the topic of belief with an open mind, on the assumption that if the person would just observe the environment more carefully, he or she would see that the initial belief is not justified. In a sense, this strategy is a subset of the previous one concerning presenting new evidence. The only important distinction is that here the person is explicitly asked to be open-minded in the observation of new evidence. For example, a person with stereotypical beliefs and prejudiced attitudes might be encouraged to take greater notice of members of the target group on the presumption that this would allow the person to see that these people are no worse than anyone else.

Will this strategy lead to a change in beliefs? A number of studies suggest that there are at least three problems with this strategy: causal interpretation of accurate observations, failure to change observation processes, and the use of judgment strategies that fail to incorporate observational data.

Causal Interpretation

First, the major problem with many maladaptive beliefs is not that they are based on faulty assessments of what can be seen, but in the causal interpretations given to what is seen. For example, it is an objective fact that blacks in this country are more likely to be unemployed than whites. If being open-minded in new observations of relative rates of employment led to accurate observations, then we still would conclude that blacks are less likely to be working than whites. The maladaptive feature of the stereotypical belief about blacks and unemployment is the further interpretation concerning the causes of unemployment, specifically the causal belief that "they could get work if they really wanted to; they simply are lazy."

Similarly, the social phobic's observation that "I frequently make a fool of myself at parties" may be entirely accurate. If so, that observation by itself may not be maladaptive. Rather, the attribution "I cannot behave in an appropriate manner at parties" is the maladaptive causal component leading to self-defeating behaviors, such as avoiding social interactions, rather than learning necessary social skills (e.g., Anderson & Arnoult, 1985a, 1985b; Anderson, Horowitz, & French, 1983).

Observation Processes

Second, people typically do not believe that they are taking a biased viewpoint, so the exhortation to "be open-minded" fails to change their approach. This allows biased evaluation of new observations to occur in several ways, including covariation detection problems, interpretation of ambiguous observations, and imaginal confirmation processes.

One of the most fundamental ways in which people extract beliefs from the environment is by use of the covariation principle (Kelly, 1973). Presumably, people detect the covariation of events and infer appropriate relations between social variables. Although people can and do detect covariations under some circumstances (e.g., Lane, Anderson, & Kellam, 1985), there is considerable evidence that people are not very good at this task (for reviews, see Crocker, 1981; Hamilton, 1981; Nisbett & Ross, 1980). This appears to be particularly true when people scan the environment for evidence to test a particular hypothesis or view the environment in light of a preexisting belief (Jennings, Amabile, & Ross, 1982).

The simplest possible covariation detection task involves the detection of a relation between two dichotomous variables. For example, one might seek to determine the relation between the presence of a particular physical symptom and the diagnosis of a particular disease. One could develop a contingency table presenting the number of cases where the symptom is either present or absent and the disease is either present or absent. The resulting four-cell table provides all of the information necessary to determine the relation between the symptom and the disease. Yet, given this information, people are quite poor at estimating this relation (Smedslund, 1963; Ward & Jenkins, 1965). To assess the relation properly, the data from all four cells are required. But the tendency is for people to assess the relation mainly on the basis of the absolute number of cases in the present–present cell; that is, the number of people with both the symptom and the disease. The implications of this tendency for the perseverance of beliefs is clear. If a socially insecure person believes that she makes more than her share of social mistakes, her covariation detection task becomes observation of frequencies of social gaffes and triumphs performed by her and others. When she unwittingly focuses on her social gaffes (the present–present cell), her attempt at open-minded observation will serve to strengthen the belief rather than diminish it, even if in fact she is not less socially competent than the comparison others. This is because the social-gaffes cell is not empty for even the most socially skilled among us.

In the more general case beyond dichotomous variables, the inappropriate perception of relations among variables is referred to as *illusory correlation* (Chapman & Chapman, 1969). Illusory correlations may arise from the inappropriate dependence on hypothesis-confirming cases as described above, from prior associations which connect the observed events, or from salience differences due to the relative infrequency of some events or to other attentional factors (Hamilton & Rose, 1980; Sanbonmatsu, Sherman, & Hamilton, 1987).

The observation of ambiguous data may also contribute to the perseverance of beliefs. Once again, stereotypes are a prime example of beliefs that influence

our processing of new data (see Hamilton, 1979, for a review). For example, Duncan (1976) demonstrated that an ambiguous shove given during an observed interaction would be interpreted differently, depending on the race of the person giving the shove. Ambiguous information may also be recalled from memory in a biased manner, depending on a stereotypical belief (Rothbart, Evans, & Fulero, 1979; Snyder & Uranowitz, 1978; see Bellezza & Bower, 1981, however, for an alternative view).

Imagination processes may also cause new observations to contribute to the perseverance of stereotypical beliefs. People use their stereotypes to fill in the gaps in ambiguous or incomplete observation situations (such as imagining a criminal in response to a radio news report). Recent work shows that people often imagine stereotype-confirming instances. Furthermore, this research suggests that these imagined events are not always distinguished in memory from real events, thus inflating the apparent frequency of stereotype-confirming events by a process of imaginal confirmation (Slusher & Anderson, 1987).

Judgment Strategies

Finally, even if new observations are evaluated in a fair manner, such observational data may not be used when a judgment is later demanded. Strategies for making judgments frequently are based on cognitive processes and knowledge structures that are unaffected by recall of genuinely probative data. An example is a process based on the recall of vivid, concrete instances, without making use of more valid statistical information (Borgida & Nisbett, 1977). For instance, a person may fully understand the summary of automobile repairs provided by a consumer magazine, yet decide on the purchase of a particular car based on the experiences of a friend with that model. In this case, the new information observed in the magazine is evaluated fairly, but it simply is not used in the judgment process.

Similarly, beliefs about a particular person may actually contain several different cognitive structures, including trait summaries and evaluative summaries linked to particular behaviors. A new piece of relevant data (or for that matter, a challenge to old data) may influence some but not all cognitive structures concerning that person. Because different cognitive structures are relevant to different judgmental tasks, such new data (and challenges to old data) will have no impact on a particular judgment if that judgment is based on an unaffected cognitive structure (see Pryor, 1986; Wyer & Budesheim, 1987; Wyer & Unverzagt, 1985).

URGING OPEN-MINDED INTERACTION

A final strategy that one might use to dislodge a person's maladaptive belief is to encourage the person to actually interact with the environment to gain experiences that disconfirm the belief. This is somewhat different from the previous strategy in which the person was encouraged to simply observe the environment. Here we are talking about a more interactive than passive process. For example, a person may have the belief that he is unlikeable. A therapist might

encourage this person to get out and socialize some and hopefully discover that people will like him after all. Unfortunately, research once again suggests that through the interaction process this person's belief about himself may persevere rather than change. Swann and his colleagues (Swann & Ely, 1984; Swann & Hill, 1982; Swann & Predmore, 1985; Swann & Read, 1981a; 1981b) have studied in considerable detail what they call the self-verification process. Swann and Read (1981a) studied three distinct phases of social interaction and found that within each phase, people sought to verify their original self-conception. Specifically, subjects were more likely to seek social feedback when they anticipated that such feedback would confirm their self-conception; they elicited reactions from their interaction partners that tended to confirm their self-conception; and they showed preferential recall for feedback that confirmed their self-conception. Swann and Read (1981b) found that people solicit self-confirmatory feedback because they apparently regard such feedback as especially informative and diagnostic. Even significant others in a person's life apparently can contribute to the self-verification process by insulating the individual from the effects of discrepant feedback (Swann & Predmore, 1985).

Beliefs about others may also persevere through the social interaction process (Darley & Fazio, 1980). If a person enters a social interaction with a particular belief or expectation about another person, he or she may elicit behavior from that person to confirm that expectation. Such behavioral confirmation and related self-fulfilling prophecy effects have been demonstrated in a wide variety of contexts, including educational achievement (e.g., Rosenthal & Jacobson, 1968) and social interactions (e.g., Snyder, Tanke, & Berscheid, 1977; see J. Darley's Chapter 3, this volume, for an excellent treatment of these phenomena).

Furthermore, in some social interactions people test their hypotheses about others via behaviors (questions) that tend to elicit confirming data. Through this hypothesis-testing process (e.g., Snyder & Swann, 1978), a person may persevere in the belief that "Mary is an extrovert" by asking questions of her that guarantee an extroverted response (e.g., "What would you do to liven up a party?"). Although recent work shows that this biased hypothesis-testing process does not always occur (Bassok & Trope, 1983), there are situations in which it does.

Social theories may also be artifactually confirmed via social interaction processes. Stereotypes about groups may lead to interactions which confirm the stereotype. During the oil boom days of 1979–1982, many native Houstonians developed a strong stereotype about "the damn Yankees" moving in from the north. The stereotype included such features as pushy, hostile, aggressive, suspicious, and rude. Unfortunately, this stereotype led to interactions that had to confirm the stereotype; that is, maltreatment by longtime residents forced many newcomers to behave in suspicious and hostile ways. One common "trick" played on newcomers was to run them off the road; any car with out-of-state plates was fair game. For newcomers, the two possible responses were to not drive (a near impossibility in Houston) or to drive as aggressively themselves. The latter response, of course, confirmed the stereotype. Such defensive aggression similarly has been demonstrated in laboratory situations using games (Kel-

ley & Stahelski, 1970). In short, people's expectations about others often lead to behaviors which elicit the expected behaviors whether driven by social impressions or social theories.

We now have outlined four strategies by which maladaptive beliefs may be challenged and seen a variety of processes by which beliefs may persevere in the face of these challenges. At this point one may be tempted to throw up one's hands in despair, both because of the ubiquity of perseverance effects and because of the apparent complexity of processes surrounding these effects. We agree that there are many routes to perseverance and many obstacles to belief change. However, we also have seen a pattern in many of these processes that gives us a clue to understanding the ubiquity of perseverance and a tool for reducing it.

UNDERLYING PROCESSES

As we see it, a common thread underlying many perseverance effects is that a preestablished point of view leads to biased outcomes of normally unbiased processes. This point of view may be a particular belief, a more general belief about human nature (e.g., people act a certain way because of dispositional factors), or simply a hypothesis which a person is testing. However, regardless of its exact nature, it appears that the biased point of view itself often arises from people's propensity to see the social world in causal terms. This propensity results in resistance to each of the challenges to beliefs presented above.

CAUSAL THINKING AND OPEN-MINDED INTERACTION

The biased point of view in the "open-minded interaction" strategy is set up by causal beliefs of the form, "If Mary is an extrovert, she will answer this question in an extroverted way"; that is, Mary's trait of extroversion will cause her to behave in a particular way, and the subject can test her by seeing if she does indeed behave that way. Hence, it is the causal belief that Mary's actions are based on her disposition that justify the biased questioning. Without this causal connection, the social perceiver would be less likely to question Mary in a biased fashion, because he or she would be more likely to recognize other situational constraints on Mary's actions (such as the fact that Mary is answering biased questions, as posed by the perceiver). Again, Chapter 3 in this volume discusses the body of relevant research, so we do not examine it further here.

CAUSAL THINKING AND NEW EVIDENCE

The biased point of view in the "open-minded observation" and the "presentation of new evidence" strategies also is based on causal thinking. For example, excessive reliance on the present–present cell in covariation detection tasks follows naturally from causal statements of the form, "If I am socially incompetent, then I must commit numerous social gaffes." Similarly, a belief in a particular

social theory encourages one to evaluate new data in a biased light, particularly if those data are themselves of ambiguous quality. Thus, although the subjects in the study by Lord *et al.* (1979) were biased in their assessments of the quality of new data (i.e., the capital punishment studies) as a function of the data's support of their theory, these people were not unreasonable from their own point of view. The new data did have problems and ambiguities, and these were pointed out to the subjects in the stimulus materials. Data which contradict prior beliefs (be they social theories, self-impressions, or social impressions) invite closer examination than beliefs which are consistent with prior expectations.

Support for the contention that causal thinking contributes to perseverance in the face of new data comes from several studies on hypothetical explanation of social theories (e.g., Anderson & Kellam, 1988; Anderson & Sechler, 1986). Two general findings have emerged from this work. First, hypothetical (causal) explanation of an event typically increases one's subjective likelihood for the event. For example, explaining why people who take risks *might* make better firefighters than conservative people leads one to believe that people who take risks *are* better qualified as firefighters. Second, beliefs based on nothing more than hypothetical explanation are seldom abandoned when new and valid contradictory evidence is presented. It seems as if the reasonableness and availability of the hypothetical causal explanation is taken as evidence of its veracity, even when there is no objective evidence in its support and despite contradictory evidence. To date, there are no comparable studies on the impact of explanation-induced self- or social impressions when new data are subsequently examined.

CAUSAL THINKING AND DISCREDITED OLD EVIDENCE

The role of causal thinking in belief perseverance has been most closely examined in the debriefing paradigm. Recall that in this paradigm the target beliefs are created via presentation of some initial evidence, which is later totally discredited. Self-impressions, social impressions, and social theories have been examined for causal-thinking effects in the debriefing paradigm.

Self-Impressions

Although Ross *et al.* (1975) did not empirically test any causal-thinking hypotheses in their initial work on belief perseverance, they argued that the generation of causal explanations could account for the perseverance effects observed in their study. Faced with evidence of either good or bad performance on the suicide note discrimination task, subjects would seek an explanation for this performance in light of their personal knowledge about past experiences (e.g., knowing someone who committed suicide). Even after the evidence indicating a certain level of performance was discredited, the generated explanation remained salient, causing subjects to remain convinced of their previously perceived level of ability.

Fleming and Arrowood (1979) tested this hypothesis by varying subjects' opportunity to engage in causal explanation. In their study, subjects once again were asked to perform the suicide note discrimination task and were assigned to

one of four explanation conditions. In an interference condition, subjects were required to perform a simple mental task between the time they received their preassigned performance feedback and the time they were debriefed about the fictitious nature of this feedback. This was designed to discourage the generation of causal explanations related to the performance during this time. Other subjects were in a delay condition, in which they simply were asked to sit and wait during this time, whereas a third group of subjects, in a facilitation condition, were asked to write down all possible reasons for their performance. In each of these conditions, feedback was delivered only after all the suicide note trials had been completed. This differed from the procedure used by Ross *et al.* (1975), in which feedback occurred after each trial. Speculating that trial-by-trial feedback might itself foster the generation of causal explanations, Fleming and Arrowood included a fourth condition replicating the Ross *et al.* procedure, except that no delay was provided between the final trial and the debriefing. As the dependent measure, subjects in all conditions were asked to estimate their true performance relative to that of the average student. The results offered dramatic support for the role of explanation processes in belief perseverance. Perseverance was observed in all of the conditions except for the interference condition. Furthermore, the magnitude of the perseverance varied systematically across the conditions, with a regression analysis showing an increase in perseverance as one moved from interference through delay to the facilitation condition.

Davies (1982) also manipulated the amount of processing subjects were likely to carry out to explain current performance in relation to past experiences. Using mirrors, Davies manipulated the self-focus of subjects at various times in the suicide note discrimination task. Subjects who were self-focused prior to debriefing presumably engaged in more self-relevant information processing related to their apparent performance, and thus they were expected to show increased perseverance. Self-focus after debriefing was expected to show the opposite effect. This hypothesis was based on earlier research showing that self-focus helped individuals to perceive self-relevant information more accurately. Thus, subjects in this condition were expected to be more aware of the unfounded nature of their initial beliefs and therefore show decreased perseverance. In fact, this pattern of results did occur. Self-focus before debriefing did increase the perseverance effect, whereas postdebriefing self-focus decreased the effect.

Perseverance of self-impressions does not always increase when people are explicitly asked to explain the target event. This is because people can create a variety of explanations having quite different implications for self-beliefs. Jennings, Lepper, and Ross (1981) told subjects that they would be participating in a blood drive being conducted by the Red Cross. Their task would be to phone potential donors and persuade them to donate blood. The subjects phoned a confederate who either did or did not agree to donate. Half the subjects were asked to explain this success or failure and then received the discrediting information. All subjects completed the dependent measure, assessing their self-impressions, by predicting future performance at the telephone task. Results of this study once again demonstrated significant amounts of belief perseverance.

Self-impressions were significantly affected by the success or failure experience, but the discrediting of that experience did not significantly reduce its impact. However, the explanation manipulation did not have an effect in this study. The authors speculated that spontaneous explanations were occurring even in the absence of explicit instruction, due to the high self-relevance of this task (see also Anderson, 1983a). Examination of the written explanations (by Jennings and Anderson) yielded another possibility. Many subjects explained their apparent failure in terms of controllable or changeable errors they made. Such attributions generally lead to expectations of greater rather than lesser future success (e.g., Anderson & Jennings, 1980). Thus, some subjects' generally positive self-beliefs about their social persuasiveness led them to create explanations allowing positive self-assessments to persevere in the face of failure.

In sum, causal explanations seem to play an important role in perseverance of self-impressions. However, people can and do create a variety of types of self-explanations (attributions) that vary in their implications for future events. Thus, any attempt to use causal-thinking processes to change self-perceptions must ensure that the desired type of explanation is created. Otherwise, the self-perception will only be reinforced by the explanation.

Social Impressions

Only one major study has examined the role of causal thinking in social impressions within the debriefing paradigm. Ross, Lepper, Strack, and Steinmetz (1977) induced subjects to explain key target events in the lives of clinical patients whose case histories they had read. Subjects later were debriefed concerning the fictitious nature of the target events. Despite this discrediting, subjects continued to believe that the explained events would be highly likely to occur, relative to a no-explanation control group.

Social Theories

Our own lab has focused on the role of causal explanation in the perseverance of social theories. In our initial work (Anderson *et al.*, 1980, Experiment 1) the written explanation task was included simply to enhance the probability of perseverance. In Experiment 2, the presence of the explanation task was varied to explore the mediating role of explanation. Recall that the paradigm involved subjects examining case histories of two firefighters to discover the underlying relation (half saw a positive one, half negative) between risk preference and ability as a firefighter. Some subjects wrote causal explanations for the "discovered" relation before being debriefed. Other subjects heard no mention of explanations but were still debriefed. In a final condition, some subjects wrote no explanations and received no debriefing. As expected, subjects in the positive and negative conditions differed in their final beliefs, regardless of whether they were debriefed or not. However, debriefing was not completely ineffective. Within the no-explanation conditions, beliefs were significantly less extreme for those subjects who had been debriefed. That explanation is important to the

perseverance effect was shown by an enhanced perseverance effect in explanation subjects within the debriefing conditions.

The degree of perseverance associated with a belief is likely to be affected by the type of evidence that produced the belief in the first place. In the Anderson *et al.* (1980) study, beliefs were found to be quite persistent when based on the weak evidence of two case studies. Logically, these beliefs should have been very susceptible to change, considering how little data there were to support them. In later research, Anderson (1983a) compared the amount of perseverance that would occur for beliefs originally based on weak concrete data with the perseverance of beliefs based on much more logically sound statistical data. Although the two data sets were equated for the strength of the initial beliefs they induced, significantly more perseverance occurred for beliefs based on concrete data. This difference was long lasting as well, being evident even a week after the data were discredited. A follow-up experiment (Anderson, 1983a, Experiment 2) revealed that subjects were considerably more likely to engage in spontaneous causal thinking when examining the concrete case history data, and that perseverance occurred primarily in those subjects who had engaged in causal thinking.

All of the research cited up to this point suggests that it is the availability of causal arguments supporting a belief that maintains the belief after evidence has been discredited. However, none of these studies have actually attempted to ascertain whether more supporting arguments than opposing arguments are available to a person who persists in his or her belief. Anderson, New, and Speer (1985) measured the availability of such competing arguments directly in the risk preference–firefighter ability paradigm by having subjects write out explanations for *both* possible relations, regardless of which relation they were led to believe. They found that the availability effects did indeed mirror the perseverance effect and that the availability of arguments was significantly correlated with beliefs.

However, a covariance analysis revealed that argument availability did not completely account for the perseverance effect. This leaves open the possibility that perseverance in this context may arise from other processes as well. One possibility warranting further examination concerns different ways people think about events. Most research to date has equated causal thinking with fairly verbal processes. It may be, though, that much causal thinking is in terms of scripts or scenarios having a less formal verbal structure and a more visual or imagery-based structure (see Anderson, 1983b; Anderson & Godfrey, 1987; Lord, 1980; Read, 1987; Schank & Abelson, 1977).

IMPLICATIONS FOR BELIEF CHANGE

If belief perseverance frequently arises from causal thinking and the biased viewpoints created by causal thinking, then one should be able to reduce perseverance by changing causal thoughts (and corresponding viewpoints). Researchers working in several domains have successfully tested this notion (Anderson, 1982; Anderson & Sechler, 1986; Koriat, Lichtenstein, & Fischhoff, 1980; Lord, Lepper, & Preston, 1984; Slovic & Fischhoff, 1977).

In our own lab, we have shown that having subjects create opposite causal theories (i.e., counterexplanations) either reduces or eliminates the biasing effects of initial causal thinking. This occurs both with the debriefing paradigm (Anderson, 1982) and the hypothetical explanation paradigm (Anderson & Sechler, 1986).

Similarly, Lord *et al.* (1984) had some subjects consider the opposite point of view in examining studies on the deterrent efficacy of capital punishment laws. They found that this technique reduced the biased evaluation of the "new data" and decreased the perseverance of initial beliefs.

To our knowledge, there have been no studies of similar counterexplanation procedures in the context of self- or social impressions. However, one might regard some attribution manipulations as counterexplanations, for they can provide an alternative explanation for such impressions. For example, if one knows the typical attributional style of a person for a particular type of task, one could provide the person with an alternative attribution for his or her performance at the task. If the alternative attribution is accepted as a counterexplanation for initial performance, one should observe future task performances more in line with the manipulated attribution than with the attributional style. One such study has been conducted (Anderson, 1983c; see also Dweck & Goetz, 1977). Subjects with a maladaptive attributional style performed better at an interpersonal persuasion task when given an adaptive attribution for initial failures than when no such counterexplanation was given. Conversely, subjects with an adaptive attributional style performed worse when given a maladaptive attribution than when no counterexplanation was given.

Earlier work on the role of counterattitudinal role playing and attitude change also is somewhat similar to our focus on explanation and counterexplanation. That research tradition found that role playing (counterexplanation?) frequently led to attitude change but sometimes did not (see Elms, 1967; McGuire, 1968, for reviews). In one successful paradigm, subjects played an emotional role with scenes that contradicted their attitudes, such as a smoker playing the role of one who has just been informed he or she has lung cancer (Janis & Mann, 1965).

More closely related to our own work is research on counterattitudinal essay writing. Several findings from this tradition mirror the perseverance findings discussed in this chapter quite closely. For example, when people expect to defend their own opinion, they tend to accept supporting arguments and reject opposing ones. However, they do not show this evaluation bias when they anticipate having to defend the opposing position (Greenwald, 1969). Although these studies differ from the perseverance literature in incorporating the motivational aspects of defending a position, the findings clearly are consistent with those on the biased evaluation of data in the capital punishment studies cited earlier (Lord *et al.*, 1979; Lord *et al.*, 1984). People also tend to change their opinions in the direction of assigned improvisation (consistent with explanation manipulations) and tend to remember personally improvised arguments better than experimenter provided ones (Greenwald & Albert, 1968), a finding not yet directly tested within the perseverance literature. Finally, counterattitudinal essay writing

tends to produce essay-congruent attitude change (mirroring counterexplanation effects), but only if the person has not had an opportunity to consider and reject that position prior to being assigned to defend it (Greenwald, 1970).

Implications for Therapy

At this point it may be useful to examine in more detail what implications these issues have in the context of therapy. As noted earlier, we have been interested in circumstances in which some agent, such as a therapist, wishes to alter a self-defeating behavior by changing the underlying beliefs that support it. Research suggests that such circumstances may arise in dealing with the related topics of loneliness, shyness, and depression, problems in living that often affect therapy clients. Let us examine depression from a cognitive perspective to see when and how persistent maladaptive beliefs affect behaviors and therefore become targets for change.

One belief that has often been associated with depressed people is a belief that they experience failure because of their own internal and unchangeable characteristics (e.g., Abramson, Seligman, & Teasdale, 1978; Anderson *et al.*, 1983; Weiner, 1979). This style of attribution for failure events leads to little expectancy for future success and hence to little motivation to try for better performance in the future. Quite often, this will precipitate additional failure, and a cycle of self-defeating behaviors will ensue. Clearly, one avenue to breaking this cycle is to change the client's belief about the causes of failure. The research cited in this chapter suggests that the most effective means of accomplishing this change is to encourage the client to consider alternative explanations for failure events. This method should be effective because the initial belief is causal in nature. As long as that cause is the one most salient to the client, the belief will tend to persist despite a discrediting of the data that formed it and despite the presence of any contradictory evidence.

Just how to effect such causal belief change in clinical contexts is not clear; there is no empirical evidence to date. However, theory and laboratory studies suggest several techniques. Our own work suggests that engaging in a hypothetical explanation task for a particular event may be effective (e.g., Anderson & Sechler, 1986). Other work suggests that changing a person's "causal structure" for a situation may produce more adaptive behavior. Such a change may be brought about by subtle situational manipulations (e.g., Anderson, 1983c; Anderson & Jennings, 1980). Another possibility would be to have the person rehearse adaptive causal thoughts (see Ellis, 1977).

A prototype approach to the description of a depressed person has identified a number of other beliefs commonly associated with depression (Horowitz *et al.*, 1982). These include beliefs of inferiority, beliefs about personal attractiveness, and beliefs about how other people relate to the depressed person. By attempting to change these beliefs, a therapist can seek to reduce the number of characteristics the client has that are prototypic of a depressed person. Again, it appears that the most effective means of changing such beliefs is to look at their causal nature and attempt to provide alternative causal structures.

Problems of loneliness and shyness are related to depression but focus much more narrowly on beliefs that are interpersonal in nature (e.g., Horowitz *et al.*, 1982). For example, whereas depressed people may have a maladaptive attributional style with regard to achievement situations in general, lonely people may have such a style only with regard to interpersonal achievement situations, such as meeting new people at a party. The prototype approach shows that characteristics associated with loneliness are essentially just a subset of those associated with depression, the subset dealing with interpersonal relationships.

We may also speculate on how issues of belief perseverance effect other clinical problems. For instance, cases of paranoia clearly reflect the perseverance of unsubstantiated beliefs. In mild cases, it may be useful to probe into the causal structure of these beliefs and attempt to induce a change at that level. By creating alternative causal cognitions, maladaptive paranoid beliefs may be modified. On the other hand, other clinical problems may not be amenable to belief change in this manner, presumably because they are less cognitive in nature. For example, phobias that come about as a result of more primitive learning processes, such as classical conditioning, may not respond to changes in causal structures. Only where the problems are cognitive in origin are such cognitive interventions likely to be effective.

One final note with regard to belief perseverance in the therapy context is that the client may not be the only one susceptible to this bias. Chapman and Chapman (1969) effectively demonstrated that in this regard clinicians are as fallible as anyone. They showed that when clinicians believed that certain diagnostic signs should be associated with a condition, they found this relation supported in data that were, in fact, random. More recently, Arnoult and Anderson (1988) discussed a number of causal reasoning biases in clinical practice. Thus, it is useful for all of us to keep in mind how our preconceptions can alter our view of the world.

CONCLUDING REMARKS

Overall, research from a variety of perspectives suggests that inducing people to create causal explanations congruent with a desired belief change (whether involving attitudes, self-beliefs, social beliefs, or social theories) should be effective in reducing various perseverance-related biases. We believe that explanation and counterexplanation techniques are sufficiently understood to permit testing in certain applied contexts. Indeed, one such application has already proven successful. Specifically, Sherman and Anderson (1987) used an explanation manipulation to decrease the rate of premature termination by clients receiving counseling services at a community mental health clinic. This success provides an encouraging first step toward a broader application of these techniques. It is clear that much more work needs to be done to further our understanding of perseverance processes. However, as these processes become more fully understood, we expect to see the development of improved techniques for overcoming maladaptive beliefs and their resulting self-defeating behaviors.

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