



## Causal Reasoning and Belief Perseverance

Craig A. Anderson, University of Missouri, Columbia

In 1980 my wife and I moved to Houston. In those days Houston was "boomtown." While the rest of the country was mired in an economic recession of disastrous proportions, Houston's economy was growing by leaps and bounds. In the auto industry states, particularly Michigan, Houston newspapers were in great demand, not for the quality of their reporting or their features, but for the thickness of their want ads.

The ensuing migration from the so-called rust belt to Houston produced unprecedented strains on a variety of social, economic, bureaucratic, and physical systems of the city. Traffic problems outstripped those of the Los Angeles area. City and county services were completely overwhelmed. Nothing could be done without long waits in lines. For example, I stood outside a house trailer, which was being used as a county courthouse, for over 2 hours in 98°+ weather in order to get Texas plates for my car. My problems were trivial, though, compared to those experienced by the masses of unemployed seeking work and shelter. Many families camped out in parks. Others lived under highway overpasses. Still others lived in their rusted out cars.

The quality of life had declined dramatically in just a few years. As you might guess, the local residents were not happy. The salient cause was all those damn Yankees (one word). A strong and negative stereotype developed about outsiders, and was applied to anyone with out-of-state plates on their car. The stereotype included origin (Michigan), economic circumstances (unemployed), attributions about economic circumstances (stupid, lazy), and personality characteristics (pushy, obnoxious, rude, aggressive). As you might guess, this stereotype produced a number of interesting behaviors. Of most interest to me was the obvious way such beliefs produced behaviors that guaranteed responsive behaviors that confirmed the beliefs. One popular game played by the locals was to run cars with out-of-state plates off the highway. This was especially popular among the good old boys with pick-up trucks. This produced a classic defensive competition response (Kelley & Stahelski, 1970) by the newcomers; you had to learn to identify potential attackers and how to cut them off before they got in an attacking position.

Another consequence took place at a more personal level. It was extremely difficult to make friends with neighbors if they were long time residents. My wife and I had just moved from California. Our car still had Indiana plates on it. Nonetheless, several of our neighbors greeted us by saying, "I hear you're from Michigan." One neighbor in particular had used the stereotype about newcomers to generate particularly negative and perseverant beliefs about us. No matter how good we were as neighbors, his beliefs did not

change. About 4-5 times a week I would see him in the morning as I left for work. For eight months I greeted him with a polite "hello" or "good morning" but he never once responded with anything other than a scowl.

Now, I am not the most socially skilled person in the world, but I generally manage to succeed in making new friends with little effort. How could this neighbor be so recalcitrant? How could he persevere in his erroneous and negative beliefs about me, especially in the face of the contradictory "data" I was displaying day after day? Furthermore, how could his (and other locals') general beliefs about newcomers persist, even when any objective assessment would reveal that the newcomers were essentially the same as the locals in many important ways, desiring good jobs, decent housing for their families, and good schools for their kids?

This perseverance of beliefs issue can be conceptualized as including two very different types of beliefs—beliefs about a particular individual, i.e., person impressions, and beliefs about how variables the external world are interrelated, i.e., theories. My neighbor's beliefs about me constitute perseverance of a social impression. (Self beliefs also are another type of impression belief that may be perseverant.) The belief that people from different regions have different traits (i.e., the stereotype of damn Yankees) is a type of theory, namely, a social theory.

Theories and impressions differ in many ways, but the perseverance processes involved in each are quite similar. Such beliefs may persevere because new and potentially disconfirming information is avoided. My neighbor and I did not go fishing together. Logical and empirical challenges to the "data" that give rise to unwarranted beliefs also is ineffective, because the subtraction of such data do not invalidate the belief. The fact that I was not an unemployed auto worker from Detroit did not logically challenge the beliefs that I was pushy and rude. When new data are obtained about a particular person or a theory-like variable (damn Yankees), they may be interpreted in a biased fashion. When I volunteered to help my neighbor move his boat out of my driveway so that I could get to my garage, he saw this as confirming evidence that I was rude and aggressive. Similarly, my assistance in helping his wife add a can of oil to her car was evidence of my immorality as well.

There are, of course, numerous intrapersonal and interpersonal processes that can lead people to cling to unwarranted beliefs about themselves, about others, and about how the world in general works. Indeed, one of my students and I recently completed a chapter discussing such self impression, social impression, and social theory perseverance (Slusher & Anderson, 1988). A discussion of these processes and the relevant empiri-

cal base would take far longer than either you or I would care to devote to it today.

One aspect of belief perseverance is particularly intriguing, though, because it seems to underlie most of the perseverance processes in both the impression and the theory perseverance domains. This common thread is the causal nature of the reasoning involved in most of our beliefs. My claim is that causal reasoning is responsible for the biased perspectives people take in assessing beliefs of various kinds. These biased perspectives in turn give rise to cognitive, interactional, and judgmental strategies that usually serve the perceiver quite well, but that sometimes leads to unwarranted belief perseverance.

### Causal Thinking and Perseverance

My goal today is to present evidence that causal thinking is an important determinant of belief perseverance. First, let me define what I mean by causal thinking. The most widely used definition concerns thinking in terms of reasons and explanations. For example, in several of my studies on the perseverance of social theories I have asked subjects to explain how and why it might be the case that people who make risky choices tend to make better fire fighters than those who tend to make conservative choices (e.g., Anderson & Sechler, 1986). This type of causal thinking is verbal and propositional in nature. A second type of causal thinking is more visual in nature. Specifically, one may think of (imagine) behavioral scenarios or scripts in which early scenes "enable" or lead to later scenes. For example, in research on expectations and intentions I have asked subjects to imagine a series of scenes which lead up to their donating blood (e.g., Anderson, 1983b).

My proposition is that either type of causal thinking leads to beliefs that are resistant to change, defying both logical and empirical challenges. This resistance is due, in large part, to the judgmental strategy people use when assessing the veracity of a proposition. Specifically, the availability of supporting (relative to contradictory) instances, events, reasons, and explanations is used to assess one's beliefs. Furthermore, the biased perspectives induced by such causal thinking may lead to systematically distorted cognitive processes, and subsequently to a variety of behavioral confirmation and self-fulfilling prophecy processes. In the remainder of my time today I will focus on the preliminary stages, namely evidence that causal thinking is important in producing a biased perspective and beliefs that are resistant to logical or empirical challenges.

### Basic Paradigms

There are many methods used in the study of belief perseverance. Some studies induce an initial belief by presenting manufactured data; later the data are discredited and subjects' beliefs assessed (e.g., Ross, Lepper, & Hubbard, 1975). Some studies

manipulate initial beliefs by asking subjects to create hypothetical explanations or imagining hypothetical events (e.g., Anderson & Sechler, 1986). Still others have assessed perseverance of preexisting beliefs; typically the focus is on subjects' reactions to new data, as a function of their prior beliefs (e.g., Lord, Lepper, & Preston, 1984). Other combinations of logical challenges to the empirical base of beliefs and presentations of new challenging data also have been used. We will focus on the debriefing method today.

Within these various methods there are four basic paradigms used to examine the importance of causal thinking. In each case, the basic strategy is to use one of the many methods of studying perseverance effects and to manipulate causal thinking within that method to see how such manipulations influence amount of perseverance. There are studies supporting my causal thinking proposition for both person impression beliefs and for broader theory beliefs in each of the four causal thinking paradigms. I will highlight only one study in each of the four paradigms here; focussing on the debriefing method; other examples are listed in Table 1.

### The Debriefing Paradigm

The debriefing method of studying belief perseverance was created by Walster, Bersheid, Abrahams, and Aronson (1967) and popularized by Ross, Lepper, and Hubbard (1975). In its simplest form three steps describe this method. First, subjects are led to hold one or two conceptually opposite beliefs by the presentation of some initial data. Second, some subjects are debriefed, that is, told about the totally fictitious nature of the initial data. Third, the subjects are asked to indicate their true personal beliefs. Evidence of unwarranted perseverance is when debriefed subjects who received different initial data hold different beliefs after the debriefing. Table 2 shows the sequence of events in the debriefing method.

The subjects in Ross et al., (1975) were given false feedback on a social perceptiveness test, indicating either that they had done very well (success) or very poorly (failure). Later, the information that led to these beliefs was totally discredited by debriefing subjects on the fictitious nature of the information. Finally, subjects were asked about their personal beliefs concerning how well they think they actually did on the test, and how socially perceptive they think they are. The basic finding was that even after discovering that the initial information was totally fictitious, those who had received success feedback had more positive beliefs about their social skills and performances than did those who received failure feedback. Now, how does this relate to causal thinking?

### Causal Thinking Paradigms

#### Reduce or Prevent Causal Thinking

The four basic paradigms used to examine the causal thinking proposition are listed in Table 1. In the

**TABLE 1**  
Sample Studies Relevant to the Causal Thinking and Belief Perseverance Proposition

| Paradigm                               | Type of Beliefs   |  |
|--|---|--|
|  | Person Impressions  | General Theories   |
| Reduce or Prevent Causal Thinking      | Fleming & Arrowood, 1979                                    | Anderson, 1983a  |
| Enable or Increase Causal Thinking     | Anderson, 1983b<br>Davies, 1982<br>Fleming & Arrowood, 1979 | Anderson, 1983a<br>Anderson & Kellam, 1988<br>Anderson, Lepper, & Ross, 1980   |
| Force Alternate Causal Thinking        | Anderson, 1983c   | Anderson, 1982<br>Anderson & Kellam, 1988<br>Anderson & Sechler, 1986<br>Greenwald & Albert, 1968<br>Lord, Lepper, & Preston, 1984 |
| Measure Causal Thinking or Its Results | Anderson & Godfrey, 1987<br>Fleming & Arrowood, 1979        | Anderson, 1983a<br>Anderson, New, & Speer, 1985  |

first, some conditions in an experiment are designed to reduce or prevent causal thinking. If causal thinking is important in belief perseverance then amount of perseverance obtained should be reduced in conditions that inhibit causal thinking.

Fleming and Arrowood (1979) replicated the social perceptiveness paradigm of Ross et al. Subjects were given false feedback indicating either that they had done very well on the social perceptiveness test (success) or that they did poorly (failure). Later, they were debriefed concerning the fictitious nature of the feedback, and were asked to indicate their beliefs about their true level of social perceptiveness. Also included were conditions in which causal thinking was inhibited; these subjects were asked to count backwards from 200 by 3's while other subjects were given time to (presumably) think about the causes of their performance. As expected, inhibiting causal thinking eliminated the perseverance effect, whereas the replication conditions yielded considerable perseverance. Figure 1 displays the results from these conditions.

**Enable or Increase Causal Thinking**

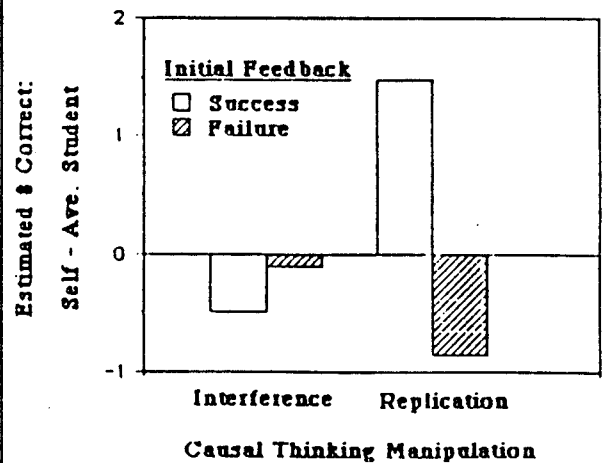
The second causal thinking paradigm consists of including conditions that enable or increase the amount of causal thinking. In my research on the perseverance of social theories I have found that different types of initial information or data produce different levels of

causal thinking (Anderson, 1983a). Using the debriefing paradigm, subjects were led to believe either that risky people make better firefighters or that conservative people make better firefighters. These belief inductions were accomplished by one of two initial information manipulations. Some subjects read case histories about two firefighters. This type of concrete information produces high levels of causal thinking. Other subjects read statistical summary data at the initial belief induction stage. This type of abstract information produces relatively little causal thinking. It is important to note that the concrete and the abstract data manipulations were constructed so that they produced equivalent initial beliefs. The causal thinking proposi-

**TABLE 2**  
The Debriefing Method Sequence

- Step 1. Subject is led to hold some belief by presentation of data (e.g., performance feedback, case histories).
- Step 2. The presented data is totally discredited (i.e., the subject is debriefed).
- Step 3. The subject's personal belief is assessed.

**FIGURE 1**  
Subjects' Estimates of Own Performance Minus their Estimates of the Average Student's Performance as a Function of Opportunity to Engage in Causal Thinking



Source: Fleming and Arrowood, 1979.

tion specifies that after debriefing subjects who had been exposed to the concrete data should demonstrate the most perseverance. This is exactly what happened, as can be seen in Figure 2. This effect persisted over the one-week period of the study, undiminished in size. Finally, internal analyses revealed that the obtained perseverance was entirely due to subjects who had engaged in causal thinking.

#### Induce Alternative Causal Thinking

The third causal thinking paradigm consists of inducing subjects to engage in alternative causal thinking. There has been relatively little work of this type in the impression belief domain, though a few attribution studies share important characteristics. For example, priming a person to think of a particular potential cause of his or her performance may be seen as inducing alternative causal thinking if the primed cause differs from the types of causes the person normally uses (e.g., Anderson, 1983c).

A cleaner example of inducing alternative causal thinking is provided in another risk preference/firefighter effectiveness perseverance study I did several years ago (Anderson, 1982). Subjects examined two case histories constructed so that either risky or conservative people seemed to be better firefighters. Half of the subjects were induced to causally consider both possible relations between risk preference and firefighting ability. Of these "consider both" subjects, half did so before examining the case history information; the other half did so after being debriefed about the fictitious nature of the case history information. The causal thinking proposition predicts that perseverance within both types of "consider both" conditions should be reduced, relative to the normal

"consider the data" conditions. As shown in Figure 3, this is exactly what happened.

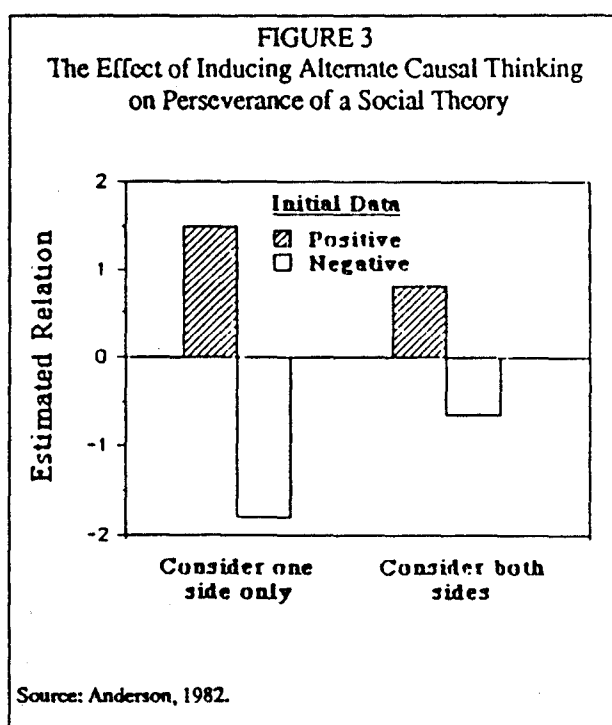
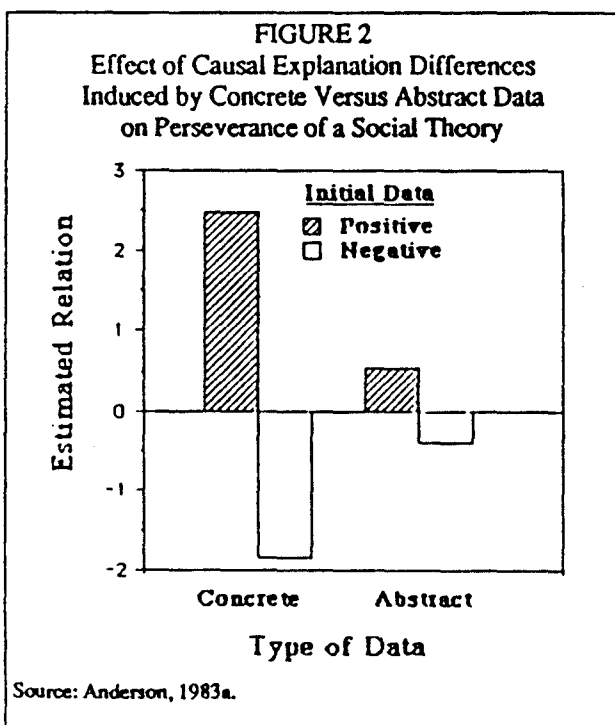
#### Measure Causal Thinking or Its Results

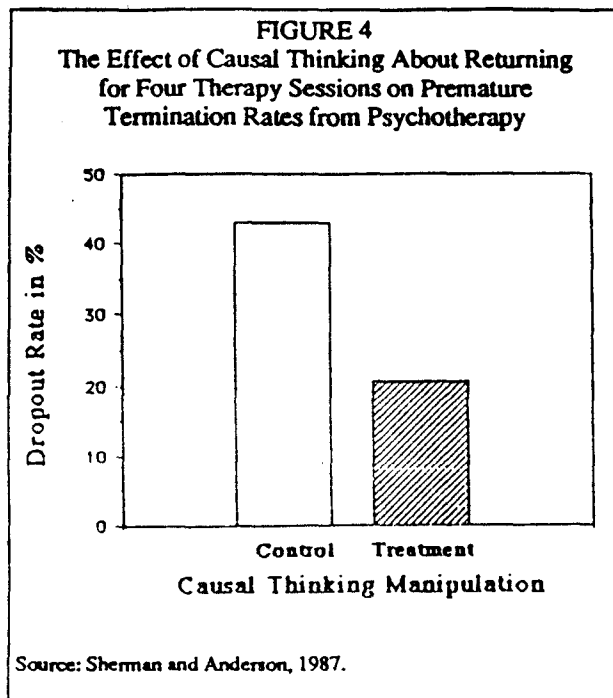
The final causal thinking paradigm actually is not a different paradigm. Basically, the defining characteristic is that measures of the proposed mediating processes are obtained. The two prime candidates are causal thinking, and relative availability of the results of causal thinking. The social theory perseverance study in which abstract versus concrete initial information types were manipulated did, as mentioned above, show that those subjects who engaged in causal thinking displayed significantly more perseverance than those who did not.

In another risk preference/firefighter ability study, my colleagues and I attempted to measure the results of spontaneous causal thinking and relate them to perseverance (Anderson, New, & Speer, 1985). Briefly, the availability of causal arguments for and against the two possible social theories (risky people are better versus conservative people are better) were assessed by having subjects write down causal arguments for each position after the debriefing. We then counted the number of such arguments. As expected, subjects generated relatively more arguments supporting the theory induced by the initial case history information. Furthermore, the resulting argument availability index was reliably associated with subjects' social theories, accounting for about 50% of the perseverance effect.

#### Conclusions

The highlighted studies all used the debriefing paradigm and the verbal type of causal thinking. Other paradigms and the behavioral scenario type of causal





thinking have produced similar results. Time constraints do not allow further discussion of these issues. However, I would like to point out that despite the converging evidence for the causal thinking, there are considerable gaps in our understanding of how all this works. Much work remains to be done, concerning, for instance, individual differences in modes of thought (verbal versus scenario), situational differences in inducing modes of thought, and practical applications of these gains in knowledge about causal thinking.

One recent study by Roberta Sherman (Sherman & Anderson, 1987) has applied some of these ideas to the problem of premature termination from psychotherapy. Some clients were asked at their intake interview to imagine and explain why they might continue attending therapy sessions for at least four visits. This procedure cut drop-out rates in half, as can be seen in Figure 4.

Further research will, I am sure, produce additional theoretical and applied advances.

#### References

Anderson, C.A. (1982). Inoculation and counterexplanation: Debiasing techniques in the perseverance of social theories. *Social Cognition*, 1, 126-139.

Anderson, C.A. (1983a). 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.

Anderson, C.A. (1983b). Imagination and expectation: The effect of imagining behavioral scripts on personal intentions. *Journal of Personality and Social Psychology*, 45, 293-305.

Anderson, C.A. (1983c). Motivational and performance deficits in interpersonal settings: The effects of attributional style. *Journal of Personality and Social Psychology*, 45, 1136-1147.

Anderson, C.A., & Godfrey, S.S. (1987). Thoughts about actions: The effects of specificity and availability of imagined behavioral scripts on expectations about oneself and others. *Social Cognition*, 5, 238-258.

Anderson, C.A., Lepper, M.R., & Ross, L. (1980). 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.

Carroll, J.S. (1978). The effect of imagining an event on expectation for the event: An interpretation in terms of the availability heuristic. *Journal of Experimental Social Psychology*, 14, 88-96.

Davies, M.F. (1982). Self-focused attention and belief perseverance. *Journal of Experimental Social Psychology*, 18, 595-605.

Dweck, C.S., & Goetz, T.E. (1977). Attributions and learned helplessness. In J.H. Harvey, W. Ickes, & R.F. Kidd (Eds.), *New directions in attribution research*, Vol. 2 (pp. 157-179). New York: Erlbaum.

Fleming, J., & Arrowood, A.J. (1979). Information processing and the perseverance of discredited self-perceptions. *Personality and Social Psychology Bulletin*, 5, 201-205.

Greenwald, A.G., & Albert, R.D. (1968). Acceptance and recall of improvised arguments. *Journal of Personality and Social Psychology*, 68, 31-34.

Kelley, H.H., & Stahelski, A.J. (1970). Social interactions basis of cooperators' and competitors' beliefs about others. *Journal of Personality and Social Psychology*, 16, 66-91.

Lepper, M.R., Ross, L., & Lau, R.R. (1986). Persistence of inaccurate beliefs about the self: Perseverance effects in the classroom. *Journal of Personality and Social Psychology*, 50, 482-491.

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.

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.
- Ross, L., Lepper, M.R., Strack, F., & Steinmetz, J. (1977). Social explanation and social expectation: Effects of real and hypothetical explanations on subjective likelihood. *Journal of Personality and Social Psychology*, 35, 817-829.
- Sherman, R.T., & Anderson, C.A. (1987). Decreasing premature termination from psychotherapy. *Journal of Social and Clinical Psychology*, 5, 298-312.
- Slusher, M.P., & Anderson, C.A. (1988). Belief perseverance and self-defeating behavior. Chapter to appear in R. Curtis (Ed.) *Self-defeating behaviors: Experimental research and practical implications*.
- Valins, S. (1974). Persistent effects of information about internal reactions: Ineffectiveness of debriefing. In H. London & R.E. Nisbett (Eds.), *Thought and feeling: Cognitive modification of feeling states*. Chicago: Aldine.
- Walster, E., Berscheid, E., Abrahams, D., & Aronson, V. (1967). Effectiveness of debriefing following deception experiments. *Journal of Personality and Social Psychology*, 6, 371-380.