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Past attributional studies have produced a consensus that negative and unexpected outcomes promote spontaneous causal search. However, there is no theoretical reason to believe that outcome has an effect on spontaneous causal attribution independent of expectancy. Past studies that found the outcome effect all suffer from the methodological problems of (a) lack of spontaneity in elicited attributions and/or (b) improper manipulation. Experiment 1 (N = 44) introduced rigorous control of the two independent variables and showed that only expectancy has an independent effect on spontaneous causal thinking. Experiment 2 (N = 100) showed that, although expectancy is the only antecedent to spontaneous *causal attribution, outcome does affect* nonspontaneous *causal search, giving a strong indication that the lack of spontaneity accounts for the outcome effect found in the past studies.*

There has been much research on spontaneous causal attribution recently as a reaction to the almost exclusive reliance in past attribution research on artificial experimental designs and reactive measurement of attribution (Clary & Tesser, 1983; Harvey, Yarkin, Lightner, & Town, 1980; Hastie, 1984; Pyszczynski & Greenberg, 1981; Winter & Uleman, 1984). The current interest in this area reflects the realization among experimental social psychologists that the issue of whether and when people make spontaneous causal attributions in the absence of any experimental instructions has serious import in its own right for social psychological research (Winter & Uleman, 1984, p. 237).

There is consensus among such studies on spontaneous causal attribution that failures and unexpected outcomes facilitate automatic causal search. This consensus is so strong that Weiner (1985) concludes his brief but influential review with a definitive statement: "There . . . seems little justification to continue to concentrate on negative outcomes and the unexpected" (p. 83). His review summarizes the findings of 17 studies of causal attribution that collectively show that negative (failure) and unexpected outcomes evoke spontaneous causal search. Yet, of the 17 studies that Weiner reviews, Wong and Weiner (1981) is the only study that shows that outcome and expectancy have independent and simultaneous effects on spontaneous causal thinking. All the others either include only one of the antecedents in their analysis or show a significant effect of one but not of the other variable.

In this article I will first argue that there is no good theoretical reason to expect that negative outcomes (failures) would prompt more causal attributions than positive ones (successes). The reasons Weiner (1985) enumerates to support the effect of failures on attribution apply equally well to successes. Instead I will advance

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an alternative interpretation that expectancy is the only antecedent that independently prompts spontaneous causal thinking and that negative outcomes evoke "why" questions (Wong & Weiner, 1981) only to the extent that those outcomes are unexpected. Next, I will reevaluate the evidence for the effect of outcome on spontaneous causal search. I will point out that all past studies suffer from the problems of lack of spontaneity in collected attributional statements and/or improper manipulation of independent variables; in effect, I will argue that the past studies do not support the conclusion that outcome has an effect on spontaneous causal attribution independent of expectancy. Then I will present experimental data in support of my argument.

THEORETICAL ARGUMENT

Outcome

Wong and Weiner (1981, p. 651) and Weiner (1985, p. 81) argue that people engage in spontaneous causal attribution in order to determine the causes of failure so as to increase the likelihood of success in the future. The law of effect (Thorndike, 1905) predicts that organisms are motivated to terminate or prevent a negative state of affairs. People must know what the causes of a negative state of affairs are before they can effectively terminate or prevent it. Thus, "effective coping importantly depends on locating the causes of failure" (Weiner, 1985, p. 81) so that people can avoid such causes in the future and prevent a resulting negative state of affairs. In other words, causal search after nonattainment of a goal (failure) serves an adaptive and hedonic function. Weiner argues that the simple avoidance of pain that the law of effect and basic behaviorist principles predict motivates spontaneous causal search after failure.

However, this line of logic does not account for why people make spontaneous causal attributions only after failure, not after success. True, the law of effect predicts that organisms will be motivated to terminate or prevent a negative state of affairs, but it also predicts that they will be equally motivated to continue or increase a positive state of affairs (Thorndike, 1905, p. 203). Therefore, people should be equally motivated to determine the causes of success so that they can actively seek such conditions in order to increase the likelihood of success in the future. Furthermore, as Weiner argues, avoidance of pain is adaptive and hedonic, but so is search for pleasure. Spontaneous search for causes of success is thus at least as adaptive and hedonic, if not more so, as spontaneous search for causes of failure. The law of effect does not explain why failure alone (and not success) facilitates spontaneous causal search.

Moreover, the distinction between avoidance of failure and search for success is somewhat artificial. In many situations (both real and experimental), success and failure are both mutually exclusive and exhaustive. A gambler either wins or loses a bet (Gilovich, 1983); a company either does well or does poorly financially in a given quarter (Bettman & Weitz, 1983); a political candidate either wins or loses an election (Foersterling & Groenvald, 1983, reviewed in Weiner, 1985); a student gets either a satisfactory or an unsatisfactory grade on an exam (Follette & Jacobson, 1987). In such situations, where the only possible outcomes of success and failure are mutually exclusive and exhaustive, avoiding failure automatically means attaining success and vice versa. People can improve their station or self-esteem if they can locate the causes of failure and avoid them. But they can also achieve the same objective if they can locate the causes of success and maintain them, because attaining success means avoiding failure. Thus, avoiding failure and seeking success are often one and the same. By the same token, searching for causes of failure (in order to avoid them) is one and the same with searching for causes of success (in order to keep them). Therefore, whatever motivates spontaneous search for causes of failure must also motivate the same spontaneous search for causes of success. The two cognitive processes are not as separate as they appear.

Expectancy

If both positive and negative outcomes can prompt spontaneous causal search, as the foregoing discussion suggests, then individuals' search for causes does not vary as a function of outcome valence; there is no persuasive and logical reason to expect that negative outcomes *alone* generate automatic causal search. However, the second factor identified by Weiner as motivating causal search is reasonable; it does make sense to predict that unexpected outcomes prompt individuals to search for their causes. First, Heider (1958) argues that people make causal attributions in order to understand their environment and render it predictable for the future. The simple fact that a particular outcome was unexpected means that the attributor did not understand the environment. Consequently, further causal search is necessary in order to make sense of it. Second, exploratory behavior after unexpected and novel events promotes adaptation and survival (Berlyne, 1960). Causal search is just one instance of exploratory behavior in the face of uncertainty. Weiner (1985) terms the first principle *mastery* and the second *functionalism*. Third, symbolic interactionists have long recognized that individuals in their everyday interactions spontaneously offer verbal explanations when their behavior is potentially or actually disruptive—that is, unexpected given the social situation and the roles the individual actors play in it (Hewitt & Stokes, 1975; Scott & Lyman, 1968; Stokes & Hewitt, 1976).

Fourth, there is abundant research evidence in nonachievement contexts (which do not involve success and failure) that unexpected events motivate individuals to search for spontaneous explanations (Clary & Tesser, 1983; Hastie, 1984; Pyszczynski & Greenberg, 1981).

It therefore seems more reasonable to argue that expectancy is the only antecedent to spontaneous causal search and that both failure and success can facilitate spontaneous causal attributions but only when they are unexpected. Negative (but not positive) outcomes very often generate such spontaneous search simply because failures are more likely to be unexpected than successes. Because people normally have a choice over whether to pursue a particular line of behavior and invest in it, they usually choose to initiate an endeavor in which they expect to succeed.[1] They would not engage in a task if they expected to fail. Individuals usually expect to succeed in their pursuit of a goal (Irwin, 1953; Marks, 1951; see also Miller & Ross, 1975); failures in most real situations are usually unexpected.

I therefore argue that the established relationship between negative outcome and the likelihood of causal attribution observed in many past studies is spurious and can be explained (in Lazarsfeld's [1955; Kendall & Lazarsfeld, 1950] sense) by expectancy. Negative outcomes often generate spontaneous search for their causes because such failures are usually unexpected. I propose that expectancy is the only causal antecedent that independently generates spontaneous search and that outcome does not have an effect on spontaneous causal search once expectancy is properly controlled. Past findings of the outcome effect may well have been the result of improper control of the expectancy variable.

REEVALUATION OF PAST EMPIRICAL EVIDENCE

Table 1 lists five published studies that have found an effect of outcome on spontaneous attributional search.[2] The first four were included in Weiner's (1985) more comprehensive list of all the studies on spontaneous causal thinking; the last one was published after Weiner's review appeared. The list is complete to the best of my knowledge. Only Schoeneman, van Uchelen, Stonebrink, and Cheek (1986) specifically examined the determinants of spontaneous attributional search since Weiner (1985).[3]

All the studies in Table 1 seem to suffer in various ways from one or both of two methodological problems: (a) lack of spontaneity in the elicited causal attribution and (b) improper manipulation of outcome and expectancy variables.

Lack of Spontaneity

Any investigation into spontaneous causal attribution must make sure that the attributional statements obtained from the subjects are truly spontaneous. This means that the experimental design must not be too obtrusive, and the researchers must not use too much experimental prompt and probe to obtain attributions. If the researchers ask their subjects to provide causal attributions, then their subjects' responses will not be purely spontaneous, and whatever conclusions researchers might draw from their data analysis do not necessarily apply to spontaneous causal attribution.

TABLE 1: Studies That Found the Outcome Effect

	Results		
Study	*Outcome*	*Expectancy*	*Interaction (Outcome × Expectancy)*
Wong and Weiner (1981)	Yes	Yes	Yes
Lau (1984)	Yes	No	No
Gilovich (1983)	Yes	No	—
Gioia and Sims (1986)	Yes	—	—
Schoeneman, van Uchelen, Stonebrink, and Cheek (1986)	Yes	No	—

Wong and Weiner's (1981) method is an example of too much experimental prompt. For instance, in their Experiment 1, Wong and Weiner asked their subjects "to imagine that they expectedly or unexpectedly succeeded or failed at a midterm test" (p. 652). After a brief description of the hypothetical condition, the subjects were asked: "What questions, if any, would you most likely ask yourself?" The results showed that "failure and unexpected outcomes generated more attributional questions than did success and expected outcomes, respectively" (p. 652). Their Experiment 5 used similar methodology and obtained similar results.

However, their conclusion might have been a bit premature in light of the spontaneity problem. Even though Wong and Weiner claim that their method is "unobtrusive" and therefore causal attributions generated in their experiment are truly "spontaneous," there is still enough prompt from the experimenters to cast doubt on the spontaneity of the subjects' attributions. Although Wong and Weiner instructed their subjects not to write any questions if none came to mind, it is easy to imagine that the subjects would come up with something under such an experimental instruction if only to please the experimenters. The subjects' attributions are thus not really spontaneous, because Wong and Weiner's design is not as unobtrusive as others, such as Harvey et al.'s (1980) or Clary and Tesser's (1983).

The experiment by Schoeneman et al. (1986) has the same problem as Wong and Weiner's (1981), essentially because it used the same experimental prompt. Schoeneman et al. (1986) instructed their subjects to re-

call a past event in their life that conformed to a specific experimental condition. The subjects were given the instruction "In the space below, please describe in your own words an occasion when you experienced an interpersonal (academic) *expected* (*unexpected*) *success* (*failure*)" (p. 355). After they described and characterized the event of their choice, the subjects were instructed (à la Wong & Weiner, 1981) to list the questions they had asked themselves just after the event they wrote about. The analysis found a significant main effect of outcome but not of expectancy. However, as in the case of Wong and Weiner (1981), the conclusions may not be directly applicable to *spontaneous* causal attribution, because the experimenters gave the subjects too much instruction and prompt in order to obtain their responses.

Lau (1984) is an example of a nonexperimental study on causal attribution that shares the problem of lack of spontaneity. Lau performed a content analysis of sports pages to determine when sportswriters make causal attributions to account for the outcome of professional football games. He found an effect of outcome on the frequency of attributions. Local sportswriters made more attributions after their home town team's loss than after a win, but their attribution did not vary as a function of pregame expectations. Lau also found that the effect of outcome interacted with time; sportswriters made increasingly more attributions after losses by their team as the season progressed.

However, the causal attributions that sportswriters make in their printed stories are not truly spontaneous. Their writing activities and the written stories themselves are constrained by some external forces, because the sportswriters have a very specific audience to address. They must first satisfy their editor to get their story printed, and the printed story must please their readers to maintain the readership. Their causal attributions, then, reflect much more than their pure cognitive processes. The attributional accounts the sportswriters make in their stories are therefore closer to what Miller (1978, p. 1222) calls causal description than to causal perception.

So in various ways, Wong and Weiner (1981), Schoeneman et al. (1986), and Lau (1984) suffer from the same problem of lack of spontaneity; the causal attributions they gather and analyze in their studies seem less than spontaneous. Wong and Weiner (1981) and Schoeneman et al. (1986) use too much experimental instruction and probe to elicit attributions, and the attributional accounts in Lau's (1984) stories reflect more than the sportswriters' spontaneous thinking.

When the causal attributions are less than spontaneous, the attributor in essence faces a certain demand from the audience (be they the experimenters or the readers) for an explanation for an outcome. One prevalent type of explanation after failure (but not after success) is the excuse.[4] Snyder, Higgins, and Stucky (1983, p. 4) define excuses as "explanations or actions that lessen the *negative implications of an actor's performance*, thereby maintaining a positive image for oneself and others" (emphasis added). People feel compelled to give reasonable accounts or excuses for their failures in order to maintain "a positive image" for themselves. Such a need to offer excuses does not arise after successes because successful performances presumably have no "negative implications."

Furthermore, in their study of excuse giving in *social* situations, Weiner, Amirkhan, Folkes, and Verette (1987) show that giving no excuses amounts to acceptance of responsibility for one's behavior whereas giving "good" excuses absolves the individual of such responsibility to a large extent. If this finding is applicable to the *achievement* context (which involves success and failure), it can account for the outcome effect when the attribution is less than spontaneous. People may offer more attributions after failure, in the form of excuses, in order to avoid personal responsibility. Both our common sense and the definition from Snyder et al. (1983) quoted above tell us that excuses are not necessary after successful performances, when people presumably do not mind taking responsibility.

Lau's (1984) local sportswriters probably felt a similar need to offer excuses after "their" home team lost a game. Although they were not trying to excuse their own failures, it is entirely possible that the sportswriters strongly identified with their local teams. The need to come up with good excuses may also account for the fact that Wong and Weiner's (1981) subjects asked more questions after they had been asked to imagine that they failed at a midterm test (p. 652). Similarly, in the Schoeneman et al. (1986) study, subjects may have tried to give good excuses after they were asked to describe their own experiences of failure (pp. 355-356). It is therefore at least plausible that the tendency to give excuses can account for the outcome effect found in the past studies when the collected attributions are less than spontaneous. The analyses in these studies therefore do not warrant the conclusion that negative outcomes promote *spontaneous* causal attribution.

At the same time, it is entirely possible that this need to generate excuses for failure in the face of a demand for explanation is so strong that it overwhelms people's natural (i.e., spontaneous) tendency to seek attributions for unexpected outcomes. The strong demand for excuses may explain why, in at least two of the studies (Lau, 1984; Schoeneman et al., 1986), the expectancy failed to have an effect on elicited causal attribution. Given the external demand for explanation—either from the experimenters in Schoeneman and associates' (1986) case or from the editor/readers in Lau's (1984) case—the

outcome valence (success vs. failure) may have been more salient than the expectancy (expected vs. unexpected) of the event, and Schoeneman et al.'s subjects and Lau's sportswriters may have responded primarily to the outcome valence despite their natural tendency to seek out plausible explanations for unexpected events.

Improper Manipulation

However, improper manipulation is the more serious problem than the lack of spontaneity from which many past studies on spontaneous causal attribution suffer. To establish that outcome and expectancy have independent and simultaneous effects on spontaneous causal attribution, the two variables must be simultaneously included and independently manipulated; one must be varied while the other is held constant. If there is any contamination in the manipulation procedure, one cannot reach any valid conclusion about the independent and simultaneous effects of the variables. Because there is an empirical correlation between outcome and expectancy in real life, such improper manipulation will result in a misleading conclusion. Specifically, as I argued above, successes are more likely to be expected and failures are more likely to be unexpected (Irwin, 1953; Marks, 1951; Miller & Ross, 1975); therefore, improper control for expectancy will lead to the conclusion that negative outcomes have an effect on spontaneous attribution even when there is no independent outcome effect.

The study by Schoeneman et al. (1986), discussed above, has this problem of improper manipulation as well as that of lack of spontaneity. In that study, the subjects recalled and made attributions about an event some 10 months earlier, on the average (p. 356), rather than about a concurrent event provided by the experimenters. Although the experimenters did ask their subjects to recall an event of a specific type (such as "an academic expected failure"), there was no rigorous experimental manipulation of outcome and expectancy; the subjects themselves simply recalled an event in their own past to make attributions for. Such lack of rigorous experimental control is apt to lead to a false conclusion of an outcome effect.

Lau's (1984) nonexperimental study of sportswriters shares this problem of improper manipulation, because Lau did not derive the measure of expectancy from the attributors themselves. He used the "odds posted by 'Harrah's Reno Race Sportbook,' published in Wednesday issues of the *Times*" (p. 1021) as his measure of expectancy for the games. Thus, people who expected a certain outcome of the game were different from those who made attributions for it. One can assume that experienced sportswriters either are familiar with the posted odds or can come up with the same expectation on their own, but it is possible for the two sources of expectation to disagree. Lau's design differs from mainstream attribution research, which usually derives the expectancy, either directly or indirectly, from the attributors themselves.

This problem of the separate source of expectancy is compounded by the longitudinal nature of Lau's study; he collected all the attributions made by the same sportswriters throughout a single National Football League season. Because local sportswriters have a specific and fixed audience (their home-town sports fans), their stories must be consistent throughout the season. To achieve this consistency, many sportswriters develop their own "theory of the season,"[5] which predicts how their team will do during a particular season. Once formed, their theory of the season becomes their long-run expectancy for the performance of their team. Consequently, it is reasonable to assume that their attributions will be guided more by the long-term expectancy dictated by their theory (so that their stories can be consistent throughout the season) than by any odds posted by someone else for a particular game. Lau's (1984) findings, therefore, do not mean that sportswriters' attributions are not responsive to prior expectations; they are just responsive to different ones.[6]

A study by Gilovich (1983) is another example of improper manipulation of expectancy. Gilovich studied the attributions that gamblers made after their wins and losses and found a significant effect only for outcome and not for expectancy. However, as Gilovich (1983, p. 1123) himself recognizes, there is a problem with his expectancy measure. His subjects were free to choose which games to bet on; presumably they chose those of which they were reasonably confident. So most subjects expected to win when they bet. The variation of expectancy was therefore rather limited; the lack of relationship between expectancy and attributions may well be due to the limited variation in expectancy.

In some studies, expectancy is not included at all. Gioia and Sims (1986) studied simulated interactions between managers and subordinates and found that the number of attributions the managers made about the subordinates was significantly influenced by the outcome of the subordinates' performance (success vs. failure). The past history of the subordinates' performance did not affect the managers' attributions. Although expectancy in this situation would be a direct function of the subordinates' past history and their present performance (such that their performance would be expected if it is consistent with their past history and unexpected if it is inconsistent), Gioia and Sims did not include this crucial variable in their MANOVA. Because one of the two important variables is missing, one cannot draw any

definitive conclusions about the independent and simultaneous effects of outcome and expectancy from Gioia and Sims's (1986) study.

Once again, in various ways, Schoeneman et al. (1986), Lau (1984), Gilovich (1983), and Gioia and Sims (1986) all suffer from the same problem of improper manipulation. Because they failed (a) to include the outcome and expectancy measures simultaneously and/or (b) to vary one variable while controlling the other, the conclusions from these studies do not directly address the independent and simultaneous effects of outcome and expectancy on spontaneous causal attribution.

The reevaluation of past studies thus casts some doubt on Weiner's (1985) earlier definitive conclusion. None of the five studies conclusively demonstrates that outcome and expectancy have independent and simultaneous effects on spontaneous causal attribution. In the next sections, I will present experimental data that support my argument that only unexpected outcomes prompt spontaneous causal thinking. In Experiment 1, I will introduce rigorous and independent manipulation of outcome and expectancy and show that only expectancy has an independent significant effect on spontaneous causal attribution. In Experiment 2, I will adopt a balanced-replication format and provide further evidence in support of my argument. Experiment 2 will show that, whereas only expectancy affects *spontaneous* causal thinking, outcome valence may affect *nonspontaneous* causal thinking and therefore the outcome effect found in the past studies may indeed have been due to lack of spontaneity in their attribution measures.

EXPERIMENT 1

Method

Subjects and design. The subjects were 44 students in undergraduate sociology courses at the University of Washington, who participated in the experiment to earn extra course credit. The experiment was a 2 (Outcome: success vs. failure) × 2 (Expectancy: expected vs. unexpected) design, and the experimental stimuli were randomly varied across subjects. Each cell had 11 subjects.

Materials. The vignette dealt with a hypothetical third person named John, who did either well ("maintained an A average") or poorly ("maintained a C average") in high school. John then went on to college and either did well ("maintained around a 3.5 GPA") and graduated with distinction or did poorly ("his GPA in college remained at around 1.0") and dropped out after the first year. Systematic cross-variation of the high school performance and college performance creates four versions of the vignette (expected-positive, expected-negative, unexpected-positive, unexpected-negative), and each subject received one of the four versions as the experimental stimulus.

Procedure. The experimental procedure closely followed a study by Clary and Tesser (1983), which employed very little experimental prompt in order to maximize the spontaneity of subjects' causal attribution. The subjects in each experimental condition gathered in a language lab and were assigned individual booths. The experiment was described to them as examining "informal interpersonal communication." The experimenter asked the subjects to listen to a story "about someone in a real-life situation." They were to listen to it "as if to listen to a friend telling you a story," to grasp the general picture rather than pay close attention to the details. The subjects then listened to one of the four versions of the vignette through their headsets.

After the story was over, the experimenter asked the subjects to retell the story "as if to tell a story to a friend who has not yet heard the story." They were to tell the story "in a way so that this friend can fully understand the events in the story." The experimenter reminded them that there was no time limit and they could take as much time as they wanted. Before the actual retelling began, subjects were given 1 min to "think about the story and reconstruct it in your own head." Then they retold the story at the same time into individual microphones attached to their headsets. The retold stories were individually recorded on separate tapes. After everyone was finished, the subjects filled out a very short questionnaire for manipulation checks.

In designing Experiment 1, I took special care to address the two problems that the past studies encountered. First, I used no experimental prompt or probe to elicit causal attributions. The subjects were merely asked (à la Clary & Tesser, 1983) to "retell the story in your own words." No reference was made to making attributions or asking questions. Second, both outcome and expectancy variables were included and were systematically and independently varied across experimental conditions. I varied one variable while holding the other constant in a 2 × 2 design.

Dependent measure. The dependent variable was the number of causal attributions that subjects spontaneously introduced in their retold stories. A causal attribution is defined as any statement that contains causal conjunctions (e.g., *because, since, therefore*) or otherwise answers "why" questions (Wong & Weiner, 1981). A sec-

TABLE 2: Number of Spontaneous Causal Attributions, by Experimental Condition, Experiment 1

Expectancy Condition	*Outcome Condition*		
	Positive	*Negative*	*Total*
Expected	7	8	15
	(0.64)	(0.72)	(0.68)
Unexpected	14	12	26
	(1.27)	(1.09)	(1.18)
Total	21	20	41
	(0.95)	(0.91)	(0.93)

NOTE: Numbers in parentheses are the mean number of spontaneous causal attributions per retelling.

ond judge, who was unaware of the experimental hypothesis, rated a portion of retold stories on this measure. Interjudge agreement was 87%.

Manipulation checks. An examination of postexperiment questionnaires revealed successful manipulation of the independent variables. On a 7-point scale (0-6), subjects rated John as significantly more successful in the positive-outcome versions of the vignette ($M = 5.5$) than in the negative-outcome ones ($M = 0.6$), $t(50) = 27.22$, $p < .001$. Similarly, subjects rated John's academic performance in college as significantly more expected in the expected-outcome versions ($M = 4.5$) than in the unexpected-outcome ones ($M = 1.9$), $t(50) = 5.10$, $p < .001$. Therefore, independent and simultaneous manipulation of outcome and expectancy was successful through systematic variation of the vignette.

Results and Discussion

Table 2 presents the total number of spontaneous causal attributions obtained in different experimental conditions and their mean number per retelling. The ANOVA shows a significant main effect of expectancy, $F(1, 40) = 5.04$, $p < .05$, but not of outcome, $F(1, 40) = 0.04$, $p > .8$. The unexpected vignettes elicited significantly more spontaneous causal attributions than the expected ones. There was no significant difference between the positive and the negative vignettes. There was no interaction between outcome and expectancy, $F(1, 40) = 0.38$, $p > .5$.

The results of Experiment 1 therefore support my alternative argument that only expectancy affects spontaneous causal thinking. However, to demonstrate conclusively that the lack of spontaneity (along with improper manipulation) is the reason for the outcome effect observed in the past studies, it is not sufficient to show (as I did in Experiment 1) that the outcome effect disappears when the elicited attribution is strictly spontaneous. In addition, one needs to demonstrate that the outcome effect remains when the dependent measure of causal attribution is less than spontaneous. Experiment 2 will do exactly that.

EXPERIMENT 2

Method

Subjects and design. The subjects were 100 students in an introductory sociology course at the University of Arizona, who participated in the experiment to earn extra course credit. The experiment was a 2 (Outcome: success vs. failure) × 2 (Expectancy: expected vs. unexpected) × 2 (Spontaneity: spontaneous vs. nonspontaneous) design. Subjects were first randomly assigned to one of the two spontaneity conditions and then, within each condition, randomly received one of the four experimental stimuli. Each cell in the spontaneous condition had 13 subjects, and each cell in the nonspontaneous condition had 12 subjects.

Materials. The vignette used in Experiment 2 was similar to the one used in Experiment 1, with one substantial modification: It now significantly involved the subjects themselves instead of some hypothetical third person ("John"). All versions began with the sentence "Imagine you are starting college as a freshman, and before you begin your classes in the fall, you are required to take an advanced placement test for math." The subjects were told that they were either well prepared in math ("You have taken four years of math in high school. . . . and you have done very well in all of these math classes. . . . ") or not prepared in it at all ("You only took two required math classes in high school. . . . You received a D– for both classes"). Then the subjects took the advanced placement test and either did very well ("placed in the top 5% of your class") or did very poorly ("placed in the bottom 5% of your class"). Once again, systematic cross-variation of their performance in high school math and their performance on the placement test created four versions (expected-positive, expected-negative, unexpected-positive, unexpected-negative). Each subject received one of the versions as the experimental stimulus.

Procedure. The experimental procedure in the *spontaneous* condition closely replicated that of Experiment 1, with one slight change in the instructions. The subjects now were instructed "to listen to the story as if the events described in the story actually happened" to them, in order to maximize their involvement.[7] The experimental

TABLE 3: Number of Causal Attributions, by Experimental Condition, Experiment 2

	Spontaneous Attributions			*Nonspontaneous Attributions*		
Expectancy Condition	*Positive Outcome*	*Negative Outcome*	*Total*	*Positive Outcome*	*Negative Outcome*	*Total*
Expected	22	29	51	51	55	106
	(1.69)	(2.23)	(1.96)	(4.25)	(4.58)	(4.42)
Unexpected	46	45	91	42	66	108
	(3.54)	(3.46)	(3.50)	(3.50)	(5.50)	(4.50)
Total	68	74	142	93	121	214
	(2.62)	(2.85)	(2.73)	(3.88)	(5.04)	(4.46)

NOTE: Numbers in parentheses are the mean number of causal attributions per subject.

instructions and procedure in the spontaneous condition in Experiment 2 otherwise remained the same as in Experiment 1.

In the *nonspontaneous* condition, subjects listened to the same four versions of the vignette as in the spontaneous condition. After they listened to the story, the experimenter elicited specifically nonspontaneous causal attributions from them by asking: "Why do you think you did how you did on the advanced placement test for math? What causes or reasons can you name for your performance on the test?" To further reduce the spontaneity in the elicited attributional statements, the experimenter asked the subjects to write down their answers on a sheet of paper.

In Experiment 2, I adopted the balanced-replication format and conducted essentially the identical experiment in two conditions with one significant variation in the experimental instructions. In the spontaneous condition, I once again used no experiment prompt or probe to elicit causal attributions. The elicited attributions are thus truly spontaneous. In contrast, in the nonspontaneous condition, I minimized the spontaneity in the subjects' attributional statements by two means: (a) by directly posing the "why" question to them and (b) by asking them to write down their attributions rather than simply vocalize them as in the spontaneous condition. I wanted to elicit specifically nonspontaneous and reactive causal thinking in order to examine the role played by the lack of spontaneity in the previous studies.

Dependent measure. The dependent measure in Experiment 2 was the same as in Experiment 1: the frequency of causal attributions. The measure was defined in the same way as before. Two independent coders, neither of whom was aware of the experimental hypothesis, rated all the retold stories in the spontaneous condition. The subjects themselves enumerated their reasons for their performance in the nonspontaneous condition and thus eliminated the need for coding the frequency of causal attributions in this condition. Intercoder agreement in the spontaneous condition was 95%.

Manipulation checks. An examination of postexperiment questionnaires once again revealed successful manipulation of the independent variables. On the same 7-point scale (0-6), the subjects rated their own hypothetical performance as significantly more successful in the positive-outcome versions of the vignette ($M = 5.0$) than in the negative-outcome ones ($M = 0.8$), $t(98) = 15.79$, $p < .001$. Similarly, subjects rated their performance as significantly more expected in the expected versions of the vignette ($M = 4.7$) than in the unexpected ones ($M = 1.9$), $t(98) = 7.95$, $p < .001$.

Results

Table 3 presents the total number of causal attributions made in each cell and their means per subject for both spontaneous and nonspontaneous conditions. The ANOVA showed a significant main effect for expectancy, $F(1, 92) = 10.36$, $p < .01$, outcome, $F(1, 92) = 6.79$, $p < .05$, and spontaneity, $F(1, 92) = 43.73$, $p < .001$. More important, however, there were significant two-way interactions between expectancy and spontaneity, $F(1, 92) = 7.76$, $p < .01$, and between outcome and spontaneity, $F(1, 92) = 5.47$, $p < .08$. In other words, unexpected outcomes tend to prompt only spontaneous causal attribution, whereas negative outcomes affect the frequency of nonspontaneous causal attribution. The interaction between expectancy and outcome was not significant, $F(1, 92) = 0.85$, $p > .3$, but the three-way interaction was, $F(1, 92) = 4.77$, $p < .05$.

GENERAL DISCUSSION

The data presented here challenge the current strong consensus among attribution researchers that outcome and expectancy have independent and simultaneous effects on spontaneous causal attribution. The data instead support the alternative argument that only expectancy has an effect on spontaneous causal search (Experiment 1). Outcome valence does seem to have an effect on *nonspontaneous* causal attribution (Experiment 2), suggesting that the lack of spontaneity in the elicited

attributions may indeed have been the reason for the outcome effect observed in many previous studies.

Improper manipulation of outcome and expectancy leads to the false conclusion of the outcome effect because there is a natural correlation between the two variables in real life such that most successes are expected and most failures are unexpected (Irwin, 1953; Marks, 1951; Miller & Ross, 1975). Anything less than rigorous control of the two variables will therefore lead to the conclusion that negative outcomes increase spontaneous causal attribution even when only unexpected outcomes have that effect. At the same time, as the results of Experiment 2 suggest, the lack of spontaneity may also be responsible for the outcome effect found in some past studies. The tendency toward excuse giving after failures may possibly account for the outcome effect on nonspontaneous causal attribution. People feel compelled to offer more attributions (in the form of excuses) after failure than after success when faced with an audience's demand for explanation (Snyder et al., 1983; Weiner et al. 1987). Expectancy failed to have an effect on nonspontaneous causal attribution in Experiment 2 probably because the specific demand for explanations in the experimental instruction was so strong that it overwhelmed the subjects' natural tendency to seek attributions in the face of unexpected outcomes. In any event, the data collected in the two experiments support the alternative conclusion that (a) expectancy is the only antecedent to spontaneous causal attribution and (b) outcome can affect causal thinking but only to the extent that there is some correlation (as there often is in real life) between outcome and expectancy and/or the causal thinking is nonspontaneous.

In the context of the unquestioned consensus on Weiner's (1985) definitive conclusion, the alternative argument advanced in this article and the supportive evidence have important implications for future research on spontaneous causal attribution. The effect of the unexpected on subsequent causal search reinforces Heider's (1958) notion of mastery. Human beings have a need to make sense of their environment and render it predictable. The evidence also affirms Berlyne's (1960) prediction that the search for the causes of the unexpected facilitates adaptation and survival.

More important, however, the results presented above support my earlier contention that an outcome of an event, in and of itself, does not matter for the process of spontaneous causal attribution. The analyses point to a seemingly somewhat counterintuitive possibility that whether people succeed or fail makes no difference to their subsequent spontaneous attributional activity. If the outcome (be it success or failure) is expected, there is no need to ask questions. People already know why they succeeded or why they failed, and this particular outcome does not add any useful information. If the outcome (be it success or failure) is unexpected, then a series of "why" questions must be asked. Why did they succeed? Why did they fail? People search for answers to these questions because they want to repeat/maintain their success or they want to avoid/terminate their failure in the future.

The results also undermine Weiner's conclusion that there is "little justification to continue to concentrate on negative outcomes and the unexpected" (1985, p. 83). The data suggest the need for continued research on the precise effects of outcome and expectancy on the process of spontaneous causal attribution. Future researchers in this area will need to remember, however, to keep the two concepts clearly separate and to manipulate them appropriately. They will also need to remember to differentiate spontaneous from nonspontaneous causal thinking. This article suggests that, when the two variables are clearly distinguished and independently manipulated, expectancy is the only one that affects spontaneous causal attribution, whereas outcome may influence nonspontaneous causal attribution.

NOTES

1. Obvious exceptions to this principle are cases of forced participation. For instance, students must take an exam at a scheduled time whether they are prepared (and can therefore expect a success) or not. Some of the studies reviewed later in this article involve such cases of forced participation.

2. Of the relevant studies in Weiner's (1985) list, Foersterling and Groenvald (1983) is published in German, and Stanton (1984) is an unpublished Ph.D. dissertation.

3. I did not include Harvey, Yarkin, Lightner, and Town's (1980) study on unsolicited interpretation, even though it found that a seriously negative outcome elicits more spontaneous attribution than a mildly negative outcome. As the authors themselves recognize (p. 554n), the results for the two levels of negativity are not generalizable to outcome valence in general (positive vs. negative). Because the authors cannot separate the effect of negativity from that of seriousness, their findings are not unequivocal support for the outcome effect.

Follette and Jacobson's (1987) study on the effects of attributions on how people cope with stressful events did not find an effect of outcome (operationalized as stress). However, it did not find an effect of expectancy either, and for that reason it is as much evidence against my argument as studies that found the outcome effect. But I decided not to include this study in my list, because Follette and Jacobson failed to elicit any attribution from the majority of their subjects. More than two thirds (69%) of the subjects provided no attributions in response to the probe "What are your thoughts and feelings about your performance on the exam?"(p. 1209). Because the fact that people make spontaneous causal attributions is well established and so far uncontested (Clary & Tesser, 1983; Harvey et al., 1980; Hastie, 1984; Pyszczynski & Greenberg, 1981; Weiner, 1985; Winter & Uleman, 1984; Wong & Weiner, 1981), such a low response rate points to some failure in experimental manipulation, as the authors themselves recognize (p. 1209).

4. I thank Arie Kruglanski for bringing the literature on excuse giving to my attention.

5. I owe this insightful concept to Judy Howard.

6. Lau and Russell (1980) used the same content analysis of sports pages and the same source of expectancy for the games. Yet, their findings were the reverse of Lau's (1984); they found a significant effect of expectancy but not of outcome (consistent with my argument in this

article). The studies by Lau (1984) and Lau and Russell (1980) are very similar; the only difference is the former's use of repeated measures for a single attributor. Therefore, if any variable accounts for the divergent findings of the two studies, it has to be the use of repeated measures and the inclusion of the time dimension, with the consequent widening discrepancy of the two sources of expectancy that I discuss here.

7. I thank an anonymous reviewer for pointing out the need for such self-involvement on the part of the subjects in the experimental procedure and its possible implications.

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