Journal of Personality and Social Psychology
1981, Vol. 40, No. 4, 650-663

0022-3514/81/4004-0650$00.75

When People Ask "Why" Questions, and the Heuristics of Attributional Search

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Five experiments making use of a self-probe methodology in both simulated and real conditions demonstrated that individuals do engage in spontaneous attributional search. This search is most likely when the outcome of an event is negative and unexpected. Content analysis of attributional questions also suggested that causal search is biased toward internality after failure but toward externality following success. This reverse of the oft-reported hedonic bias implicates the adaptive function of causal search. The data also revealed that the most commonly used heuristic in attributional search is to center on the locus and control dimensions of causality. The importance of heuristics in causal search and the advantages of the self-probe methodology employed in these investigations are discussed.

Central to attribution theory is the assumption that people spontaneously engage in attributional activities. But there is little or no published evidence to substantiate this claim (Bem, 1972; Wortman & Dintzer, 1978). In the literature of attribution research, subjects typically are asked to make attributions either by completing a fixed number of rating scales or by providing open-ended explanations for events. Both methods are highly reactive. In the absence of adequate methodology, the issue of whether lay people engage in *spontaneous* attributional activities remains unsolved. In this article, we re-examine this issue, identify the major preconditions for attributional search, propose a new self-probe methodology, and then present data yielded by this methodology.

A presumption guiding this article is that it is more fruitful to ask *when*, rather than *if*, attribution occurs. No one has proposed that the attribution process goes on at all times. To the contrary, many investigators in the attribution area have contended that individuals carry with them sets of beliefs, schemas, or presuppositions as to how various causes and effects are related (see Kelley & Michela, 1980). If our experiences conform to our beliefs and expectations, then there is no need to search for explanations. For example, the conviction that "aptitude" is a relatively stable characteristic is generally accepted in our culture; students with proven aptitudes in, for example, math or artistic endeavors are expected to do well in those areas. Given this belief and expectation, success in these activities should not call for explanation or elicit attributional search.

A corollary of the above reasoning is that attributional search will take place when one's experiences cannot be readily assimilated into one's existing belief system. A frequently encountered difficulty in the assimilation of information results from disconfirmation of existing beliefs and related expectancies. Examples of this type of disconfirmation abound in real life: cheating by a person with a reputation for honesty and integrity; failure by a student known to be competent; or rejection of a manuscript submitted by an established author. In each of these cases, the disconfirmed expectations are based on the belief that perceived dispositions such as honesty, competence, and

This research was supported by a Leave Fellowship from the Social Sciences and Humanities Research Council of Canada to Paul T. P. Wong and a grant from the Spencer Foundation to Bernard Weiner.

The authors are grateful to Alan Worthington for statistical consultation.

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creativity are relatively stable. Disconfirmation of expectations based on consensus information, such as task difficulty, also is likely to trigger the attribution process. For example, failure at an "easy" task is inconsistent with the expectations generated by the concept of "easy."

The hypothesis that expectancy disconfirmation instigates attribution processes has been alluded to by a number of investigators (see Lau & Russell, 1980; Pyszczynski & Greenberg, 1981). For example, it has been suggested that atypical events are more likely to elicit multiple causality than typical events (Kelley, 1971). Furthermore, it has been demonstrated that novel or unexpected events promote exploration (Berlyne, 1960); attributional search can be considered one instance of the more general class of exploratory behaviors.

In addition to expectancy disconfirmation, frustration (failure) is hypothesized to be a second potent instigator of the attribution process. The law of effect dictates that organisms are motivated to terminate or prevent a negative state of affairs. But effective coping importantly depends on locating the cause(s) of failure. In this case, attribution serves an adaptive function. In support of this line of reasoning, there is evidence that rejection in an affiliative context is more likely to elicit attributional search and information seeking than is acceptance (Folkes, in press). Furthermore, it has been documented that failure in instrumental learning and at achievement-related tasks promotes exploration (Wong, 1979). Finally, there is evidence to suggest that people are motivated to preserve their self-esteem; attribution may also serve a defensive function when self-esteem is threatened (Zuckerman, 1979). In sum, it is hypothesized that expectancy disconfirmation (unexpected events) and frustration (nonattainment of a goal) will give rise to attributional search.

Unfortunately, the reactive methodologies currently in use do not permit an unambiguous test of these hypotheses. Diener and Dweck (1978) overcame the reactive issue and have reported a measure of spontaneous attributions. In one of their investigations, children were instructed to verbalize "what they were thinking about" while performing. But this procedure has a number of limitations. When one is still engaged in problem solving, it is only natural to be preoccupied with possible ways and means of solving the problem rather than explaining the anticipated outcome. The absence of attributional cognitions in their mastery-oriented subjects might be so explained.

The present self-probe methodology is a modification of Diener and Dweck's procedure. Instead of asking subjects to verbalize what they are thinking while performing, we asked subjects to report what questions, if any, they would ask themselves *following* a particular outcome. Since causal explanations are answers to "why" questions, self-questioning seems to be a direct and natural way to gauge the extent of attributional search, and it at least has the face validity of measuring the presence and depth of one's search for causal understanding. To broaden the sample of cognitions reported by the subjects, in our final experiment we instructed them to report whatever questions or thoughts came into their minds following an event.

Experiment 1

The main purpose of this experiment was to document that individuals do spontaneously ask "why" questions and that the extent of causal search is determined by the nature of the outcome (success vs. failure) and expectancy (expected vs. unexpected outcome). We predicted that both frustration (failure) and expectancy disconfirmation (unexpected outcome) would instigate more attributional search than success and an expected outcome.

Given the above contexts, most of the questions that people spontaneously ask were expected to be related to attributional search. However, individuals also may raise action-oriented questions (e.g., "What can I do about the situaton?"). Studies of coping with stress (e.g., Folkman, Schaefer, & Lazarus, 1979; Lazarus, 1966) have documented the existence of "secondary appraisal," a process of evaluating one's coping resources and options. It was predicted that failure would also elicit more of such action-oriented questions than would success.

Finally, it was anticipated that unexpected outcomes would evoke more reeval-

uative questions than expected outcomes. Since in the present study expectancy was primarily based on the belief that one was a strong or weak student, expectancy disconfirmation should have resulted in a state of imbalance (Feather, 1971; Heider, 1958) or dissonance (Festinger, 1957) in regard to oneself. To maintain self-consistency, one may either "explain away" the unexpected outcome or modify one's beliefs to accommodate the outcome. The latter strategy may give rise to questions related to the reassessment of one's competence (e.g., "Am I smarter than I think?").

Method

Seventy students (41 females and 29 males) participated in the sudy as part of their course requirement for introductory psychology at the University of California, Los Angeles (UCLA). They were tested in two groups of approximately equal size.

The subjects were given a questionnaire containing four hypothetical situations (2 levels of outcome × 2 levels of expectancy). They were asked to imagine that they expectedly or unexpectedly succeeded or failed at a midterm test. For example, in the unexpected failure condition, they were to believe that they were "strong" in a subject, but they unexpectedly failed the midterm exam. The order of presentation of the four conditions was randomized, and the subjects were instructed that they could work on these conditions in any order. After the description of each condition, the subjects were asked, "What questions, if any, would you most likely ask yourself?" They were told not to write any questions if such inquiries would not characterize their thinking. No other instructions were given.

Results and Discussion

The responses were classified into four mutually exclusive categories: attribution, action, re-evaluation, and miscellaneous, with an interjudge agreement of 94%. Attribution questions are "why" questions concerned with the possible causes of the outcome (e.g., "Why did this happen?" "Did I study hard enough?"); action questions are concerned with possible courses of action and generally have a future orientation (e.g, "What can I do to pass?" "Shall I get a tutor?"); and re-evaluation questions are concerned with the reassessment of one's ability or aspiration (e.g., "Have I underestimated myself?"). Miscellaneous questions include any that cannot be classified into these three categories. (The distinctions and examples for each category were given to the judges prior to coding.)

Figure 1 shows the total number of questions asked (top panel) as well as the number of questions asked in the attribution (middle panel) and action and re-evaluation (bottom panels) categories. Only 5% of the questions fell in the miscellaneous category; they are not included in the figure. Concerning causal ascriptions, failure and unexpected outcomes generated more attributional questions than did success and expected outcomes, respectively, $F(1, 69) = 79.34$, $p < .001$; $F(1, 69) = 80.50$, $p < .001$. There also was a significant Outcome × Expectancy interaction, $F(1, 69) = 9.69$, $p < .001$, primarily due to the very low rate of responding in the expected success condition.

As hypothesized, failure generated more action-oriented questions than success, $F(1, 69) = 32.35$, $p < .001$. Expected failure gave rise to the greatest number of instrumental questions, resulting in a significant Outcome × Expectancy interaction, $F(1, 69) = 31.29$, $p < .001$. In fact, expected failure generated four times more instrumental questions than did unexpected failure. Perhaps expected failure (i.e., prolonged frustration) poses a greater threat and calls for more instrumental considerations. There is indeed some evidence that expected failure is more stressful, because 29% of the instrumental questions in the expected condition dealt with escape/avoidance (e.g., Should I drop the course?), whereas all of the instrumental questions in the unexpected condition were related to mastery-oriented coping actions (e.g., working harder, changing one's study habits, etc.).

Re-evaluation questions also conformed to prediction, occurring only following unexpected outcomes. There is some suggestion of a positivity bias in that people were more likely to re-evaluate themselves favorably following unexpected success than to consider downgrading themselves following unexpected failures, $F(1, 69) = 5.80$, $p < .05$.

In sum, it appears that individuals do engage in attributional search and are more likely to do so following failure and unexpected outcomes. There is also evidence of action-oriented questions, particularly after

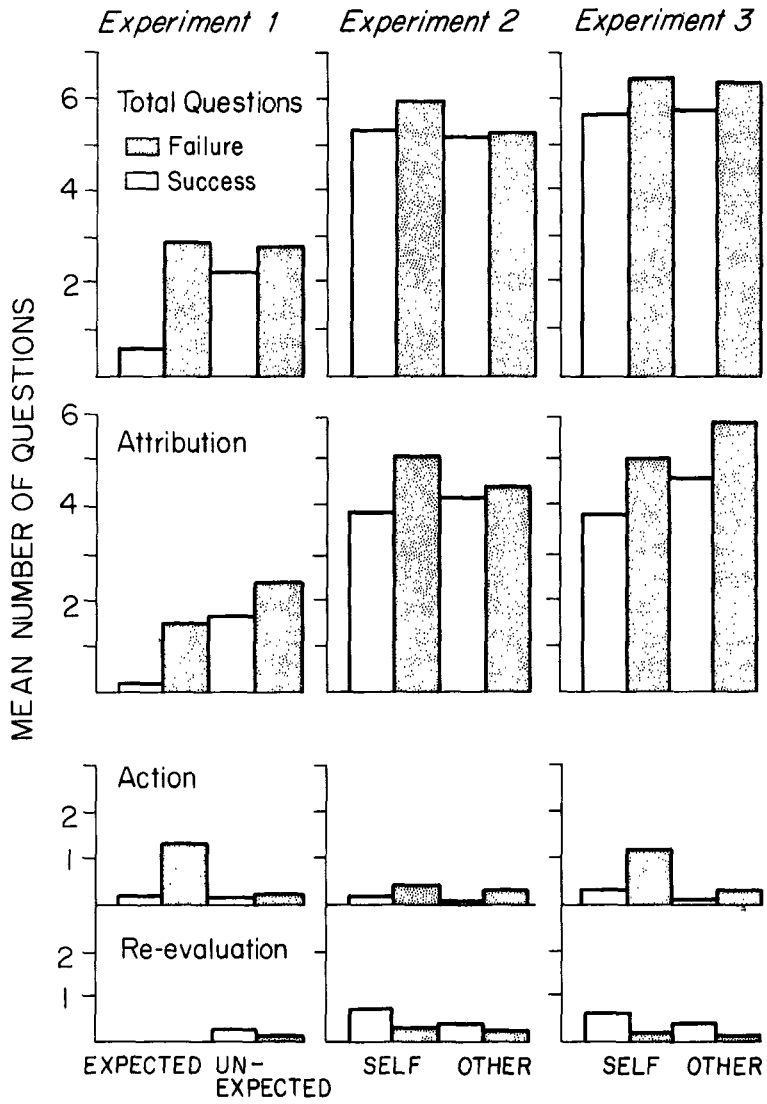

Figure 1. Mean number of responses in the four categories, as a function of the experimental conditions.

expected failure, and re-evaluation questions given unexpected events, particularly after unexpected success. Nearly all the questions that subjects asked can be classified into the three categories of attribution, action, and re-evaluation. But attributional questions comprised the largest proportion of the total questions asked.

Experiments 2 and 3

People do apparently engage in attributional activities, but it is not known how they search for causation. By causal or attributional search we simply mean the process of searching for causal understanding. Although it has long been recognized that how people search for causal ascription is vital to our understanding of the attribution process (Kelley, 1967, 1971), not much is known about causal search. We assume that this search probably takes the form of a series of implicit self-directed questions, for example, "Is it because of me?" Such questions are essentially hypotheses formulated

by an individual concerning possible causes. (How these hypotheses are tested is another fundamental issue in attributional research that will not be dealt with in this article.) We also assume that individuals use heuristic rules that restrict causal search to selected areas of the total possible solutions (see Simon & Newell, 1971). That is, causal search is neither random nor exhaustive but is guided by a set of heuristics. We conceptualize these heuristics as various focuses of attention that guide individuals to formulate hypotheses and seek relevant information in their search for causal understanding.

The psychological significance of perceived locus of causality (Lefcourt, 1976; Rotter, 1966) and perceived control (Bandura, 1977; Langer, 1975; Seligman, 1975) has been demonstrated in a variety of situations. It is hypothesized here that the process of causal search will first focus on the source or locus of causality (whether the cause resides within the person or in the external world) and then shift to the controllability of the cause (whether it is subject to personal influence). Finally, attention will turn toward causal stability (whether the cause is likely to change). These three focuses of attention correspond to the three primary dimensions or properties of causes specified by Weiner (1979). Intention and generality (globality) also have been suggested as possible dimensions of causality (Abramson, Seligman, & Teasdale, 1978; Rosenbaum, 1972). At present, there is no empirical evidence concerning which of the causal dimensions is of primary consideration in attributional search.

Each causal dimension is conceptualized as a continuum with opposite poles. For example, focusing on the locus dimension may be oriented toward the internal or the external pole, just as the focus on the control dimension may be toward the controllable or the uncontrollable pole. In the search for causality, if an individual implicitly asks "Is it because of me?" followed by "Could I have prevented it from happening?", then this sequence of self-directed questions reflects the heuristic of an initial search for internal causes, followed by a focus on controllable causes. Focus of attention in causal search may influence the kinds of causal explanations reached as well as the perceived dimensional properties of a given causal ascription.

Given the above assumptions concerning causal search, the self-questioning methodology is suited for the investigation of searching heuristics. However, the problem remains as to how to identify the dimensional focus of each self-directed question. The traditional approach of dimensional categorization is to have raters code the responses. But one obvious shortcoming of this methodology is that the rater's coding may not correspond with that of the subject's. To circumvent this problem, subjects in Experiments 2 and 3 coded their own verbalizations into different dimensional focuses. Self-coding may be faulted as being just as artificial as coding by raters, but at least self-coding reflects the subject's own perceptions and phenomenological experience.

The self-probe methodology used here, consisting of both self-questioning and self-coding, provided evidence concerning the priority or temporal hierarchy of focuses of attention. In addition, it provided data concerning relative dimensional salience, which is here operationalized as the frequency of occurrence of dimensional focuses. Thus, the self-probe methodology revealed the relative priority and salience of various dimensional focuses in causal search.

Because causal search may differ for actors and observers (see Ross, 1977), perspective (self vs. other) was included as an antecedent condition in Experiments 2 and 3. Inasmuch as expected success yielded so few attributional questions in Experiment 1, an "expected" condition was not included in these experiments. Hence, Experiments 2 and 3 combined unexpected success and unexpected failure with a self- and other-perspective. In Experiment 2, a within-subjects design was used, whereas in Experiment 3 the four conditions were manipulated in a between-subjects design.

Method

The subjects in Experiment 2 were 56 introductory psychology students at UCLA (36 females and 20 males) who participated for course credit. The subjects in Experiment 3 were 86 females and 74 males from the same population, randomly assigned to one of the four

treatment conditions. All subjects were tested in a group setting.

The subjects first received a questionnaire similar to that used in Experiment 1. In the other-failure condition, for example, subjects were told, "You know your friend is strong in a subject, yet he failed at the midterm exam." Following each description, the subjects wrote the questions they would most likely ask themselves. A minimum of five questions in each condition was required so that the temporal sequence of reported thoughts could be examined.

After completion of the questionnaire, the concept of causal dimensions was introduced. The subjects were told, "In seeking an explanation for success or failure, people often ask themselves certain questions regarding possible causes. Generally, these questions can be described in terms of five different dimensions, representing five different focuses of concern." The dimensions, presented in different predetermined random orders, were described as follows:

1. The *locus* dimension is concerned with the source of causality, this is, whether the cause resides in you, some other people, or in the situation.
2. The *control* dimension is concerned with the extent of one's control or mastery over various causal factors.
3. The *intention* dimension concerns responsibility and purpose.
4. The *stability* dimension is concerned with prediction, that is, whether a causal factor will persist or change over time.
5. The *generality* dimension is concerned with the generalizability of a causal factor to other situations or to other people.

Each of the dimensions was illustrated with specific examples. In Experiment 2, the examples were drawn from achievement-related situations, whereas in Experiment 3, the examples were unrelated to achievement. For instance, the examples for the Intention dimension were "Did the teacher fail me on purpose?" (Experiment 2) and "Did he break my window on purpose?" (Experiment 3).

The subjects were instructed that a question could be classified into any number of dimensions, according to the focuses of concern that initially prompted the question. To facilitate the self-coding process, a grid was provided with the headings of the five dimensions randomly assigned to different columns, while the rows represented the order of the questions. Subjects coded the responses by placing a check mark in the appropriate dimensional column for each question (row). It was indicated that each question was to be coded independently of the preceding question.

Results and Discussion

The questions were again classified by two judges into the four categories used in Experiment 1, with an interjudge agreement of 97%. To further examine the contents of attributional questions, all attributional questions were then coded into different specific causes of ability, attitude, cheating, effort, emotion, error, general, help, knowledge, luck, motivation, physical conditions, situation, task, study method, and teacher. Several examples of each of the causal ascriptions were given to the judges. For instance, the "general" attributions were described as "nonspecific questions that are concerned with seeking explanations for on outcome," (e.g., "Why did that happen?" "How did I get an A?"). Interjudge agreement on this classification was 95%.

The mean number of questions in the three major categories for the four experimental conditions is shown in Figure 1. Analyses of the attributional questions revealed a main effect of outcome in both Experiments 2 and 3: $F(1, 55) = 14.60$, $p < .001$, and $F(1, 156) = 19.93$, $p < .001$, respectively. These results support the prediction that people ask more "why" questions after failure than after success. Only in Experiment 2 was there a significant Outcome × Perspective interaction, $F(1, 55) = 17.11$, $p < .001$, indicating that the outcome effect was more pronounced in the self than in the other condition. And, only in Experiment 3 was there a significant main effect of perspective, $F(1, 156) = 11.46$, $p < .001$, with more attributional questions raised in the other than in the self condition, In sum, the consistent finding across both studies, as was reported for Experiment 1, is that frustration (failure) is more likely to instigate attributional search than is goal attainment (success).

In the action category, the prediction that failure leads to more instrumental questions than does success was clearly confirmed in Experiment 3, $F(1, 156) = 9.89$, $p < .01$, and approached an acceptable level of significance in Experiment 2, $F(1, 55) = 3.67$, $p < .06$. Considering all three experiments, instrumental concern was consistently greater in the failure than in the success condition.

With respect to re-evaluation, the results again are consistent with Experiment 1. Success led to more re-evaluation questions than did failure: $F(1, 55) = 4.89$, $p < .05$ (Experiment 2), and $F(1, 156) = 16.08$, $p <$

.001 (Experiment 3). The positivity bias in reassessment is therefore reliably demonstrated. This bias may be more than self-serving, for it also is evident from the perspective of the observer. However, in Experiment 2 only, the tendency for greater reassessment given success rather than failure was higher in the self than in the other condition: Outcome × Perspective interaction, $F(1, 55) = 6.09$, $p < .05$. Thus, there is suggestive evidence that individuals may be especially concerned with improving their own self-concept or self-esteem (Zuckerman, 1979).

We turn next to the dimensional issues. The first topic to be examined was the temporal order of the search process. To determine this, the initial occurrence of a dimensional concern was ascertained. If, for example, the first question was judged as having a "control" focus, then control received a score of one, and so on. Given multiple classification of the same question (i.e., there was more than one focus of concern), all the dimensions involved received the same score. And if a dimensional focus was not used to code any question raised within a condition, then it received an arbitrary score of the total number of questions in that condition plus one.

The mean priority or sequence of each dimension is portrayed in Figure 2. The main effect of dimensions was significant in Experiments 2 and 3: $F(4, 220) = 85.87$, $p < .001$, and $F(4, 624) = 41.70$, $p < .001$, respectively. Linear contrasts confirmed the prediction that locus and control significantly ($p < .01$) differed from the other three dimensions. These results were exhibited across all the experimental conditions. In Experiment 2 only, locus was temporally prior to control in the attributional search ($p < .01$). The inconsistency between the two experiments can be traced to the fact that in Experiment 2, subjects tended to use single-dimensional coding for each question ($M = 1.23$), whereas in Experiment 3 there was more double-dimensional coding ($M = 2.17$). Given this inconsistency, it is not clear whether a double-focus model is a more accurate description of the initiation of the attributional process than is a single-focus model. According to the former, the focus is on the locus and control dimensions simultaneously ("Am I personally responsible for what happened?"). According to the latter, there is a focus on one dimension at a time, with inquiry about locus ("Is it because of me?") preceding thoughts about controllability ("Did I have any control over what happened?"). However, the data clearly demonstrate that these two dimensions have the highest priority in attributional search.

In addition to the temporal hierarchy of dimensions, their relative salience was determined by the frequency of their occurrence. The more frequently a causal dimension is used to classify questions, the more salient this dimension is presumed to be. The frequency data yielded a pattern of results identical to the sequence findings, with locus and control significantly more salient ($p < .01$) than the other three dimensions. It appears that a dimensional focus occurring early in the attributional search also tends to be repeated.

Although in causal search the focus is primarily on locus and control regardless of treatment conditions, the *contents* of attribution questions are dependent on both the outcome and the perspective. Both experiments were very consistent in showing that

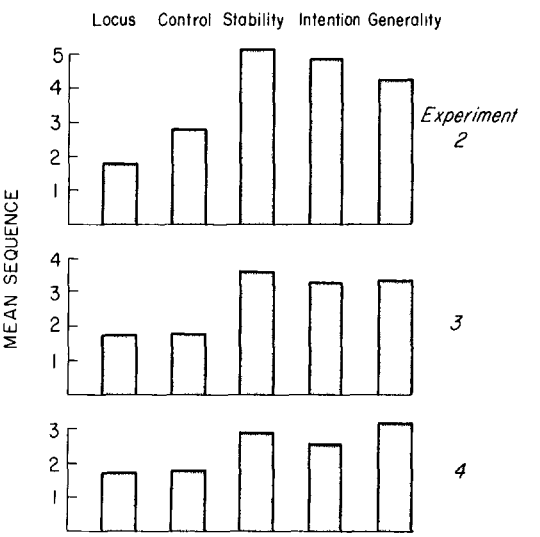

Figure 2. Mean temporal sequence of occurrence of the five causal dimensions (low values indicate high priority in the sequence). (For Experiment 4, the values are based on self-ratings.)

several causal ascriptions are associated almost exclusively with only one or two treatment conditions. More specifically, in Experiment 2, questions regarding error (11.4%), emotion (7.9%), and physical condition (4.9%) were associated with failure, but not with success (where the frequency of these attributions was either 0 or less than 1%). Questions about luck (15%), on the other hand, were associated with success, but not with failure. Further, cheating (13.2%) and help (8.3%) were associated with others' success, but not with self-success. The same pattern of asymmetry was also obtained in Experiment 3, where error (11.6%), emotion (9.2%), and physical condition (8%) were exclusively connected with failure, luck (11.5%) was associated with success, and concerns about cheating (23.9%) and help (13%) were linked with others' success.

Effort, task, teacher, and general attributions were more evenly distributed across different treatment conditions. However, analyses of variance (ANOVA) revealed that in both Experiments 2 and 3, questions concerning effort were considered more frequently after failure (26.4% and 24%, respectively) than after success (17.2% and 16.8%): $F(1, 55) = 22.01$, $p < .001$, and $F(1, 156) = 25.00$, $p < .001$. Conversely, task attributions were considered more frequently following success (22.8% and 27%) than following failure (7.8% and 13.3%): $F(1, 55) = 9.17$, $p < .01$, and $F(1, 156) = 11.63$, $p < .001$. Other causal attributions, such as ability and attitude, occurred so infrequently (less than 5% in all conditions) that they will not be discussed here.

The priority of causal ascriptions was determined by their initial occurrence in the series of questions raised by the subjects. Once again priority data were identical to frequency data. For example, in the failure condition, effort had the highest frequency as well as the highest temporal priority (the mean initial occurrences being 2.6 and 2.4, respectively, for Experiments 2 and 3). ANOVAs showed that in both experiments, effort was considered earlier after failure than after success: $F(1, 55) = 24.60$, $p < .001$, and $F(1, 156) = 26.87$, $p < .001$, respectively. Task attribution on the other hand, was considered earlier after success than after failure: $F(1, 55) = 9.17$, $p < .01$, and $F(1, 156) = 23.48$, $p < .001$.

The above data suggest that both the salience (frequency) and the temporal priority (sequence) of specific causal ascriptions are dependent on particular conditions, whereas the dimensions (focuses) remain invariant across conditions. This is logically possible because given the same focus, the direction or orientation of the focus may be biased by the outcome. For example, given the locus dimension, it may be oriented to internal causes following failure but to external causes following success. To examine this possibility, all causal attributions were classified on the basis of logical analysis into either internal causes (e.g., effort, ability) or external causes (e.g., task, luck). ANOVA were performed on the total frequencies of all internal and external causes. In both experiments, failure gave rise to greater internal orientation than success, $F(1, 55) = 101.57$, $p < .001$, and $F(1, 156) = 47.72$, $p < .001$, whereas success resulted in greater external orientation than failure, $F(1, 55) = 62.42$, $p < .001$, and $F(1, 156) = 14.18$, $p < .001$. (It should be noted that the internal cause considered most frequently—effort—is also controllable, whereas the most frequently cited external cause—task ease—is uncontrollable.) This result lends some credence to the notion that the orientation of a focus in causal search may be biased by the nature of the outcome.

The above attributional bias is in opposition to the well-known hedonic bias hypothesis, which posits that individuals internalize success but externalize failure (see Bradley, 1978; Wong, Watters, & Sproule, 1978; Zuckerman, 1979). In the introduction, it was suggested that attribution may serve either an adaptive or a defensive function. Perhaps defensive functioning predominates when one is publicly asked to give an explanation of a task already completed, whereas adaptive functioning prevails when there is a search for a solution to problems that may recur. In our data, questions about internal and controllable causes (effort) for failure typically were followed by questions about possible coping actions. The adaptive advantage of this kind of bias in causal

search is that one is motivated to plan constructive coping actions only when the cause is perceived as controllable by the actor.

Experiment 4

The prior experiments demonstrated that locus and control have the highest priority and salience among the five attributional dimensions. These results were based on self-coding of generated questions in an achievement setting. In Experiment 4, the generality of these findings was examined when the context in which the positive and negative outcomes occurred was not specified. In addition, in the prior investigations the importance of dimensional focus was determined after self-directed questions had been reported. In Experiment 4, subjects were asked to indicate the priority and salience of the different causal dimensions during the process of causal search.

Method

Sixty-one introductory psychology students at UCLA (35 females and 26 males) participated in the experiment for course credit. They were tested in a group setting.

The subjects received a questionnaire containing, in a fixed random order, the four experimental conditions (2 levels of outcome × 2 levels of perspective) used in Experiments 2 and 3. The self-success condition, for example, stated: "Suppose you just experienced an unexpected positive outcome. As you seek an explanation, what are your focuses of concern?" The subjects then were introduced to the five attributional dimensions discussed in the prior experiments; again the dimensions were characterized as focuses one might use in searching for an explanation. As in Experiment 3, the specific examples used to clarify the dimensions were unrelated to achievement events. In each of the four treatment conditions, the five dimensions were presented in a fixed random order, and the subjects rated the priority and the salience of each dimension in each condition. Priority was defined as "the order or sequence in which various focuses are considered by you." Salience was described as "the extent to which a dimension or focus of concern is persistent or prominent in your mind." For each dimension, rating scales ranging from 1 to 7 were provided.

Results and Discussion

The mean priority (sequence) ratings are shown in the bottom panel of Figure 2. An *ANOVA* revealed a significant main effect for dimensions, $F(4, 240) = 17.01$, $p < .001$. Again, the locus and control dimensions had a significant higher priority ($p < .05$) than the three remaining dimensions across all the conditions. The mean salience ratings were consistent with the priority ratings: Locus and control had a greater salience than the other three dimensions, as confirmed by a significant main effect for dimensions, $F(4, 240) = 16.97$, $p < .001$, and orthogonal comparisons contrasting the combination of locus and control with the average of the other three dimensions ($p < .05$ for all treatments). These data clearly replicated the findings in the prior investigations, even though in the present experiment the context of the outcomes was not specified and the data were based on direct dimensional ratings. In the present study, we again failed to find any significant difference between locus and control; thus, there is additional support for a double-focus model of attributional search.

The correlations between the priority and the salience ratings, considered separately for each of the four conditions and for each of the five dimensions, yielded correlation coefficients ranging from .46 to .84, with all $ps < .001$. This finding is consistent with our prior results that dimensions considered earlier in time also persist longer in thought.

Experiment 5

Experiments 1–3 demonstrated that individuals do ask "why" questions, even when not specifically directed to do so. The finding that most of the questions generated were attributional indicates that causal search is prominent in people's minds. To increase the confidence in these findings, in Experiment 5 the effects of outcome and expectancy disconfirmation were examined in a more naturalistic setting, with subjects asked to report whatever questions or thoughts came into their minds regarding their exam results.

Students were recruited as subjects after they had completed a series of midterm exams and had received exam feedback on most, if not all, of their tests. Since there was considerable difficulty in finding stu-

dents who actually expected to fail at their midterm tests, the words *success* and *failure* were defined as "doing well" and "not doing so well." In addition, because of the difficulty in obtaining students' expectancies prior to the midterm exams and maintaining their anonymity, we simply asked subjects at the time of experimental testing to indicate whether their overall midterm results were expected or unexpected.

To further document that individuals initially focus on the locus and control dimensions in causal search, in the present investigation self-coding was replaced by an objective, information-seeking behavior. Subjects were informed that prior research had produced information that might help them determine the causes of their performance on tests and that this information (contained in five separate envelopes) was organized into five categories, each reflecting a different dimension of causality. Subjects were asked to choose which envelopes they wished to examine first. The rationale for this new procedure was that in causal search, people use heuristics to formulate hypotheses (i.e., ask questions) as well as to seek out relevant information. Thus, the type of information they seek may reflect the heuristics they use. For example, if their heuristic is to focus on locus and control dimensions first, they will naturally first ask for the information pertinent to those two dimensions. This information-seeking behavior seems to be a more objective way of determining the heuristics of causal search than the self-coding method used in Experiments 2 and 3.

In sum, the present study was designed to replicate and extend the major findings of the preceding experiments in a more naturalistic achievement situation, with a broader self-probe methodology to sample attributional cognitions and a more behavioristic way of identifying the heuristics of causal search.

Method

One hundred volunteers from the introductory psychology class of Trent University were recruited as subjects. They were tested in small groups, with an average size of 15 subjects. The participants were first given a questionnaire to complete and were initially asked to indicate their own criteria for success and failure in the following manner: "For me personally, *doing well* means a grade of _____ or higher; *doing not so well* means a grade of _____ or lower." They were then instructed to "reflect on and assess your performance on all your midterm tests. According to your own criterion, do you think that you have done well or that you have not done so well? Was your overall midterm result expected or unexpected?" Subjects indicated their responses by circling a choice between doing well and not well and between expected and unexpected. Then they were told to write down in sequence what questions or thoughts, if any, came to their mind given the outcomes of their midterm exams.

In the second part of the experiment, the subjects were informed that they might ask for information yielded by past research to help them determine the cause(s) of their midterm exam performance. This information was contained in five different envelopes representing the five causal dimensions. The dimensions were introduced and defined in the usual manner on a sheet of paper. Several bundles of envelopes were observable to the subjects. The subjects were asked to indicate which envelope(s) they wished to examine first by circling the appropriate dimension(s). They were also told that they could examine the rest of the envelopes later. Following their choice, they approached the experimenter for the envelope(s). Each envelope actually contained information pertinent to that causal dimension. For example, the envelope on stability included the statement: "When people attribute success or failure to causes that are relatively stable, they tend to have strong expectancy of having the same outcome again in the future." Subjects looked at the information, returned it, and asked for their remaining selection(s).

Results and Discussion

Of the 100 subjects, 17 indicated that their failure was expected and 24 that it was unexpected; 43 reported expected success and 16 reported unexpected success. The subjective criterion for success revealed no significant differences between the outcome and expectancy groups ($F < 1$).

Responses were classified into the usual four categories, with an interjudge reliability of 95%. These data are shown in Figure 3. In view of unequal cells, planned orthogonal comparisons were executed. As predicted, failure produced a greater number of responses than success, $F(1, 96) = 23.00$, $p < .001$ (left panel). In addition, failure was associated with more attributional responses, $F(1. 96) = 17.87$, $p < .001$, and more action-oriented responses, $F(1, 96) = 18.94$, $p < .001$, than success. Concerning the expectancy variable, unexpected outcomes were related to a greater number of total responses, $F(1, 96) = 36.81$, $p < .001$,

and more attributional responses, $F(1, 96) = 9.75$, $p < .001$, than expected outcomes. Also in accordance with the findings in Experiment 1, there was an Outcome × Expectancy interaction regarding action responses, $F(1, 96) = 5.01$, $p < .05$, with expected failure generating the most instrumental responses. There was, however, no significant difference in re-evaluation. Since expectancy was not explicitly derived from beliefs about one's competence, as in Experiments 1 to 3, it is not necessary to revise one's self-concept to accommodate the unexpected outcome; therefore, very rarely did subjects reassess their own competence. What seems to be unique to the present naturalistic study is that nearly all of the re-evaluation questions had to do with one's aspirations, values, or goals, as illustrated by these questions: "Is university what I really want?", "Is it worth my while to stay in university?", "What can I get out of a university education?". Apparently, subjects had some second thoughts (i.e., re-evaluation) about the value of a university education; this type of concern was not evident in our prior simulated studies.

The responses were then subdivided into questions and statements (thoughts). The patterns of data were quite similar, with the "thought" data somewhat less sensitive to the outcome and expectancy variables than were the "question" data. The contents of statements (thoughts) were very similar to

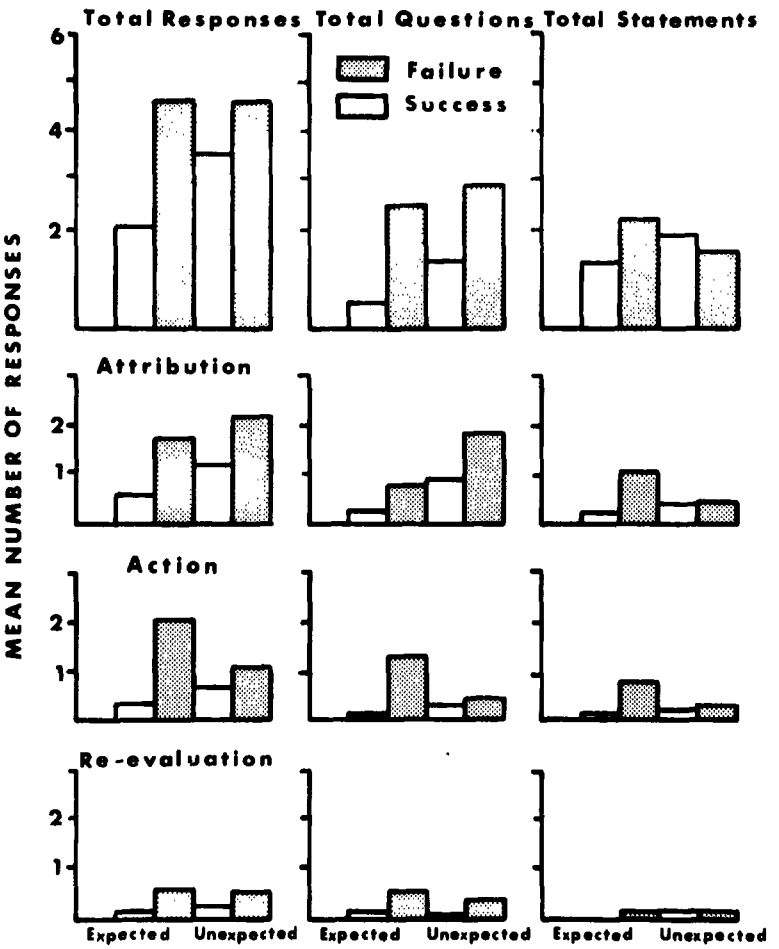

Figure 3. Mean number of total responses (left panel), questions (middle panel), and statements or thoughts (right panel) in the four conditions.

those of questions except for the finding that emotional expressions occurred almost exclusively in the form of a statement (e.g., "I feel like getting violent with the marker," "I feel like crying," "Surprised how well I am doing").

The data pertaining to information seeking are depicted in Figure 4. The upper panel of Figure 4 portrays the data of all individuals ($n = 65$) seeking only one kind of information. The hypothesis that there is greatest choice of locus or control information is supported by a binomial test ($z = 3.79$, $p < .001$). The lower panel consists of the data of all individuals ($n = 28$) asking for two envelopes. Here again the prediction that most individuals would select the combination of locus and control evidence was confirmed by a binomial test ($z = 8.30$, $p < .001$). The seven individuals asking for more than two but fewer than five envelopes all included both locus and control in their request.

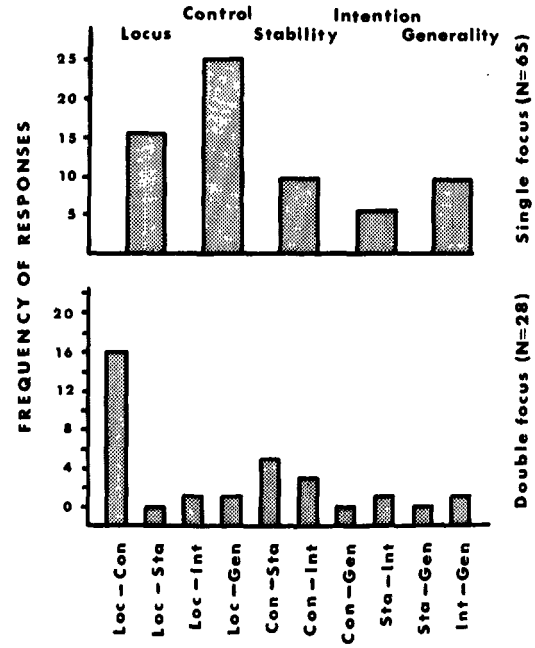

Figure 4. Frequency of responses in seeking different types of information. (Data represent number of individuals.)

General Conclusions

The five experiments presented here provide evidence regarding several fundamental issues in attributional research. First, it can be concluded with reasonable confidence that people do ask "why" questions, even when they are not specifically directed to do so. The finding that most of their queries pertain to attributions indicates that causal questions are prominent in thought. In Experiment 1, subjects were instructed to report whatever questions, if any, they would most likely ask themselves in certain hypothetical situations. In Experiment 5, subjects were asked to report whatever questions or thoughts came to their minds. In these experiments, subjects were recruited to participate in experiments designed to study cognitive processes, and it was made clear to them in the instructions that they did not have to make any verbal responses. These procedures should not bias subjects toward asking *attributional* questions. The fact that subjects also asked other kinds of questions (i.e., instrumental and re-evaluation) indicates that they felt free to ask any kinds of questions. The only experimental constraint was that subjects were exposed to a specified set of outcomes. Such a constraint was necessary because we were primarily interested in whether this particular set of preconditions gives rise to attributional search.

Second, our results are very consistent in substantiating that frustration (failure) and expectancy disconfirmation (unexpected outcomes) promote attributional search. However, they are by no means the only preconditions for attributional search. One could readily identify a number of other preconditions. For example, stressful events (personal tragedy, interpersonal conflict, natural catastrophes, etc.) are likely to be potent instigators of attribution. Novel and unknown events may have a similar instigating effect. For example, young children are generally inquisitive, not only because they have not yet developed an adequate structure of causal beliefs and knowledge but also because many experiences are still new to them. Events of great personal importance may also be an effective antecedent for attribution.

Third, we have strong evidence that at-

tributional search primarily is focused on the locus and control dimensions of causality. This finding is unlikely to derive from directive cues provided by our instructions or contexts, because it was obtained in three different experimental procedures: self-coding (Experiments 2 and 3), self-rating (Experiment 4), and information seeking (Experiment 5). We also find that the focus was oriented toward internal and controllable causes (i.e., effort) after failure, but toward external and uncontrollable causes (i.e., task ease) following success, suggesting that the orientation of the search focus is dependent on the outcome. The significance of information on the locus and controllability of cause(s) is quite apparent, inasmuch as coping actions are very dependent on such information.

The present studies have also raised several new issues. First, the attributional bias in causal search is in direct contrast to traditional findings of success–failure bias that are based on overt explanations. This reverse hedonic issue may be resolved by testing the hypothesis that motivational forces at work in causal search may be different from those used to provide a public explanation. Research is needed to determine whether a control or competence motive operates primarily in causal search, whereas the self-enhancing or defensive motive predominates in public explanations.

A second unresolved issue is the extent to which the orientation of dimensional focus determines the causal explanation reached. It seems reasonable to assume that what we find depends to a great extent on where we look. If the heuristic used is one of searching for external and uncontrollable causes first before considering internal and controllable factors, it is likely that we will arrive at some acceptable external and uncontrollable causes if we search hard enough. A great void still exists regarding the heuristics that people use in attributional search and the effects of using different heuristics on causal ascriptions. The understanding of the attribution process will depend on further analysis of the heuristics of causal search.

We have demonstrated that the self-probe methodology is a sensitive and reliable way of monitoring the presence and the extent of spontaneous attributional search. It seems only logical that given any precondition or outcome, one must first establish the presence of spontaneous causal search before proceeding to investigate other aspects of the attribution process. The present simple and unobtrusive method has also provided evidence that action and re-evaluation related cognitions are sensitive to the major antecedents (i.e., outcome and expectancy) manipulated. Also, the self-probe methodology seems well suited to investigating the heuristics and the temporal course of attributional search. In sum, the present methodology has proven fruitful in unravelling the cognitive processes of causal search, and it has taken us at least one step closer to tapping the subject's phenomenological experiences than have the more reactive methodologies commonly employed in attribution research.

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Received May 2, 1980
Revision received September 15, 1980 ■