Denial and Confirmatory Search: Paradoxical Consequences of Medical Diagnosis[1]

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An experiment was conducted to examine the effects of medical diagnostic-test results on illness appraisal and the recall of symptoms and behavior. Subjects were tested for a fictitious enzyme deficiency and were told either that the test result was positive (deficiency present) or that it was negative (deficiency absent). In addition, some of the subjects were told the test was accurate 95% of the time and others were told it was accurate 75% of the time. As predicted, subjects judged the enzyme deficiency as less serious and more prevalent when presented with positive test results. Subjects with positive test results also recalled more behaviors that had been labeled as risk factors. Although positive test subjects tended to report more deficiency-related symptoms, diagnosis did not affect the free recall of general symptoms. In addition, information concerning the reliability of the diagnostic test had no effect on judgments or recall but did affect information seeking. Subjects with positive test results were less likely to request a definitive follow-up test when their results were unreliable. The results are interpreted as evidence for independent confirmatory search and denial processes following medical diagnosis.

A fundamental concern of health psychology is the process by which individuals appraise threats to their health. Much of the work on appriasal of health threats is descriptive and nonexperimental (Cohen & Lazarus, 1979; Leventhal, Nerenz, & Steele, 1984). The present study examines the cognitive and motivational processes of illness appraisal through the methods and theoretical framework of experimental social psychology. In order to focus our investigation on some of the specific mechanisms of such appraisals, we have chosen to examine the psychological consequences of a common health care event—the provision of feedback from a diagnostic test.

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Previous work suggests two processes that may be initiated when a "bad news" test result or diagnosis is communicated to a patient. First, the patient may deny the diagnosis. Substantial descriptive evidence generated by clinical research suggests that denial and other forms of defensiveness are common initial reactions to health threats (Breznitz, 1983; Cohen & Lazarus, 1979). One common form of denial is heightened skepticism regarding the validity of the diagnosis (Visotsky, Hamburg, Goss, & Lebovitz, 1961). A second form of denial frequently reported in medical settings is the patient's minimization of the seriousness of a health threat (Janis, 1958; Lazarus, 1983; Lipowski, 1970). More generally, research in social psychology has provided evidence of defensiveness in a variety of domains where individuals are threatened by negative feedback (Burger, 1981; Zuckerman, 1979). Thus, an examination of these processes is important to a broad range of concerns in basic and applied psychology.

Another possible consequence of diagnosis is suggested by work in social and cognitive psychology. In studies of everyday reasoning (Snyder, 1981; Wason & Johnson-Laird, 1972), investigators have shown that individuals test hypotheses by acquiring confirming rather than disconfirming evidence. Swann (1983) has demonstrated that individuals also utilize a confirmatory strategy when testing hypotheses about the self. Perhaps the most relevant discussion of these issues is supplied by Pennebaker (1982), who has argued that confirmatory hypothesis-testing is also evident in the self-perception of bodily states (see also Leventhal, Meyer & Nerenz, 1980). Within the domain of health psychology, the hypothesis-testing perspective appears to predict the opposite of defensiveness. A confirmatory hypothesis-testing strategy might lead even the most anxious medical patient on a selective search for evidence that confirms, rather than disconfirms, a diagnosis.

But what factors determine whether a diagnosed health problem will be appraised as serious? Recent evidence indicates that judgments of symptoms, illnesses, and diseases are partly a function of self-relevance. Jemmott, Croyle, and Ditto (1988) surveyed 110 undergraduates and found that individuals who had experienced a health disorder judged it as less serious than those who had not experienced it. The possible explanations for this finding parallel the cognitive and motivational alternatives discussed above. Individuals may discount the seriousness of an illness for defensive reasons. They may be motivated to minimize the threat to health in order to alleviate anxiety and protect self-esteem. On the other hand, individuals who have experienced an illness have more information available to them. By searching this store of information, they may find evidence to indicate that the symptoms and course of the illness were relatively benign—after all, they survived.

In an experimental investigation of the determinants of seriousness judgments, Jemmott, Ditto, and Croyle (1986) found that individuals who were told they had an enzyme deficiency judged that problem as less serious than did those who were told they did not have the deficiency. This study obtained some control over differences in experience and information because no subject had actually experienced the disorder or had previous knowledge of it. Nevertheless, subjects who received the positive diagnosis did, in one sense, possess knowledge not shared by other subjects. Because the study employed healthy subjects, individuals who received a positive test result might have discounted the seriousness of the disorder because they were unable to recall having experienced symptoms in the recent past. This unique evidence of health in the face of a positive test result may have led these subjects to provide lower ratings of seriousness.

Clearly there exists a need for less equivocal evidence concerning the factors that mediate seriousness judgments following diagnosis. In this study, we collected several kinds of symptom and behavior recall data in order to examine how cognitive processes might mediate the appraisal process. Do individuals minimize the seriousness of health threats because they are unable to recall symptoms consistent with the diagnosis? We see a somewhat different picture. Based, in part, on previous work in social (Snyder, 1981; Swann, 1983) and health (Leventhal et al., 1984; Taylor, 1983) psychology, we believe the denial of a diagnosis can occur *in spite* of the individual's tendency to uncover *confirmatory* evidence through a biased search of health-relevant memory. Thus, we predicted that subjects who received a positive diagnostic test result would not recall fewer symptoms than other subjects. If differences in recall were obtained, we expected they would be in the opposite direction—diagnosed subjects might actually recall more symptoms, as long as those symptoms have been causally linked to the development of their health disorder (Leventhal et al., 1980).

A second factor that may mediate the impact of diagnosis on judgment and recall is the certainty of the diagnosis. In medical practice, diagnostic certainty may vary substantially as a result of variations in available technology, expertise, and medical knowledge (Fox, 1959). For example, we might expect the psychological dynamics initiated by a certain diagnosis of cancer to be very different than those produced by a tentative diagnosis. The direction of these effects, however, is difficult to predict. On the one hand, uncertainty may arouse substantial anxiety, regardless of the diagnosis. This anxiety could motivate the individual to distort information relevant to the diagnosis. It may be easier to deny the validity of a tentative diagnosis than a certain one. From a cognitive perspective, an uncertain label might cause a person to engage in a more effortful search of health-related memory in

order to resolve the ambiguity of the diagnosis. This effortful search might reveal more confirmatory evidence than a less effortful search. On the other hand, one could argue that a more certain diagnosis may furnish the individual with a more firm hypothesis, leading to a more confirmatory information search. Because certainty is an important real-world variable that is likely to affect reactions to diagnosis, it was incorporated as a second independent variable in the present study. We did not posit a specific hypothesis, however, regarding the direction of its effects.

Finally, we used this experiment as an opportunity to investigate the effect of diagnosis on another judgment relevant to illness behavior. following the experimental manipulations, participants in the study were asked to report their estimates of the prevalence of the enzyme deficiency for which they had been tested. Based on related research in social psychology, we expected a "false consensus effect" (Ross, Greene, & House, 1977), that is, that subjects who were told they had the deficiency would perceive it as more common than would subjects who were told they did not have the disorder. Such evidence would indicate that the false-consensus effect occurs in the domain of health characteristics as well as in the domains of opinions and behaviors.

Method

Subjects

Subjects were 85 undergraduates enrolled at Williams College, recruited to participate in a health survey study for extra credit in their psychology course. Because the procedure involved the ingestion of a sugar solution, only nondiabetic persons were recruited. The results of six subjects were discarded after their participation because they reported suspicions about the study. The exclusion of these data does not significantly alter the results. The final sample, then, consists of 79 subjects, 40 males and 39 females.

Procedure

The experimenter was blind to the hypotheses. In addition, the random assignment procedure was designed to keep the experimenter blind to condition for as long as possible within each experimental session.

The subjects were run individually at the college infirmary. Upon arrival they were greeted by a female experimenter in a nurse's uniform and were taken to an examination room. A written introduction informed subjects they were taking part in a field trial of a new salivary enzyme test. They were

told they would be asked to provide a saliva sample for testing and to fill out a health questionnaire.

Manipulation of certainty. After the subject signed the consent form, the experimenter randomly assigned the subject to one of the two certainty (test accuracy) conditions and gave the subject a written description of the enzyme test. Subjects were told the test was designed to detect the presence or absence of Thioamine Acetylase (TAA), a pancreatic enzyme (actually, there is no such enzyme). They were informed that "persons who lack this enzyme seem to be relatively susceptible to a complex of mild but irritating pancreatic disorders." the purpose of the project, they were told, was to develop an inexpensive and easy-to-administer test to detect the presence or absence of the enzyme. Subjects assigned to the high certainty condition were told the test appeared to be accurate 95% of the time, whereas subjects assigned to the low certainty condition were told the test was accurate 75% of the time.

Manipulation of test result. At this point the experimenter randomly assigned subjects to one of the two test result conditions (positive: deficiency-present; or negative: deficiency-absent) and carried out the manipulation, a false-feedback procedure developed by Jemmott et al. (1986). Subjects first rinsed with a mouthwash that, unbeknownst to the subject, was spiked with a small amount of dextrose. They then spit some saliva into a paper cup. The experimenter showed the subject the chemical strip to be used for testing the saliva (actually a common glucose test strip). Subjects in the positive result condition were told a color change in the strip following immersion in the saliva would indicate TAA deficiency. Subjects in the negative result condition were told a color change would indicate the absence of TAA deficiency. The test was performed and, in all cases, the test strip changed color in response to the dextrose in the saliva. In this way the subjects could clearly see the color change.[3]

Dependent Measures

The subjects were then given a booklet of dependent measures (the health questionnaire). Considerable care was taken to assure subjects of the anonymity of their responses. Each subject was asked to seal the questionnaire in an envelope and deposit it in a box containing other identical envelopes.

Subjects were asked to indicate whether their test result was positive (TAA deficiency) or negative (no deficiency). The second item on the

[3]The amount of time that subjects believe they have the disorder was kept to a minimum. About 5 min passed between diagnosis and termination of the experimental procedure.

questionnaire asked, "In your opinion, how serious (severe) a health disorder is TAA deficiency?" Responses were marked on a 22-point scale, anchored by the labels, "not serious" and "very serious." The third item asked the participant to estimate the percentage of college-age persons with TAA deficiency. The 11-point scale was labeled at each point with percentage figures, in intervals of 10.

Subjects next rated their mood on four 9-point scales, indicating how happy, worried, pleasant, and tense they felt. They were then told that a more elaborate laboratory test could detect TAA deficiency with 99.5% accuracy and that this test could be administered at a nearby hospital. The test, they were informed, required a blood sample and about 20 minutes of their time, and they would be reimbursed for any transportation costs. They were asked to indicate whether or not they wanted the follow-up test.

The next section of the questionnaire asked participants to list any symptoms or ailments they had experienced within the past month. On the next page, they were presented with a list of symptoms supposedly associated with TAA deficiency. Subjects were asked to estimate the number of days over the past month they had experienced each of the 11 symptoms listed. The symptoms were fairly common ones experienced by most college students (e.g., headache, diarrhea, backache).

Subjects were also asked to report how often they had engaged in each of nine "risk behaviors" in the past month, behaviors that were described as being suspected of increasing the risk of TAA deficiency (e.g., use of aspirin or Tylenol, getting less than seven hours of sleep, skipping a meal).

The next two items asked (scales in brackets): What do you think the chances are that the test is wrong in your case, that you are in the group for which the test is inaccurate? (22-point scale from "chance is very low" to "chance is very high"). In your opinion, how competent was the examiner who administered the TAA saliva test? (9-point scale from 1, "not at all competent," to 9, "very competent").

The last three items on the questionnaire comprised a sequential suspicion probe (Carlsmith, Ellsworth, & Aronson, 1976). The first item solicited any comments and questions. The second item asked subjects to state what they believed the purpose of the study was. The third item asked if anything about the procedure seemed puzzling or unusual. If a subject evidenced suspicion about the cover story on either of the first two questions, his or her data were dropped from the analysis.

Immediately following their completion of the questionnaire, subjects received thorough written and spoken debriefings. Two weeks later a second debriefing restated the purpose and rationale of the study. We also

interviewed several of the participants at length to insure that our debriefings were effective.

Results

Judgments of Seriousness

A three-way (Diagnosis × Certainty × Sex of Subject) analysis of variance revealed a strong main effect of diagnosis on seriousness judgments, $F(1,68) = 11.11$, $p < .001$. As predicted, subjects who were told they had tested positive for TAA enzyme deficiency rated the deficiency as less serious than those who were told they had tested negative (see Table 1). There was no main effect of diagnosis certainty on judgments of seriousness ($M = 6.83$, High; $M = 6.86$, Low), nor were there any significant two-way interactions, all Fs < 1.8. The three-way interaction was significant, however, $F(1,68) = 4.54$, $p < .05$. This reflects the fact that, within the high-certainty condition, males displayed the typical pattern of judging the deficiency as less serious when the test was positive ($M = 4.20$) than when it was negative ($M = 9.27$). For females, however, judgments of seriousness were practically identical within the two high-certainty cells ($M = 6.90$, Positive; $M = 6.70$, Negative). Within the low-certainty group, both males ($M = 5.89$) and females (M 4.17) who were told that they had the deficiency provided lower seriousness ratings than males ($M = 8.11$) and females ($M = 8.09$) who had a negative test result.

The overall correlation between seriousness judgments and prevalence estimates was negative and significant, $r = -.33$, $p < .01$. Subjects who judged the deficiency as less serious viewed it as more prevalent, and vice versa.

Prevalence Estimates

There was also a highly significant effect of diagnosis on subjects' estimates of the prevalence of TAA deficiency, $F(1,66) = 36.36$, $p < .001$. Subjects who were told that they had the deficiency provided prevalence estimates that were, on average, more than twice as large than the estimates made by no-deficiency subjects (see Table 1). None of the interaction effects were significant, nor was the main effect of certainty of diagnosis significant ($M = 26.97$, High; $M = 26.39$, Low). There was a nonsignificant tendency for females ($M = 29.17$) to perceive the deficiency as more prevalent than did males ($M = 24.34$), $F(1.66) = 3.09$, $p < .09$. Because the sex-of-subject

effects discussed thus far were the only ones revealed by our analyses, further analyses collapsed the data across this factor.

Test Accuracy

As predicted, subjects who were told that the enzyme test indicated the presence of an enzyme deficiency rated the test as more inaccurate than those who were given a negative test result, $F(1,74) = 18.50, p < .001$ (see Table 1). There was also a marginal effect of the certainty manipulation on ratings of test accuracy, $F(1,74) = 3.58, p < .07$. As expected, subjects who were told the test was accurate 75% of the time rated it as more inaccurate ($M = 7.95$) than did subjects who were told that the test was accurate 95% of the time ($M = 6.18$).

Recall of Symptoms and Causal Behaviors

Three types of deficiency-relevant information were obtained from subjects. First, subjects were asked to recall (without cue) and report *any* symptoms or ailments they had experienced within the previous month. Scores on this measure were calculated simply by counting the total number of symptoms or ailments listed. There were no significant effects of the

Table 1

Mean Judgments of Seriousness, Prevalence and Test Inaccuracy as a Function of Test Result

	Test result	
Judgment	Positive	Negative
Seriousness[a]	5.40	8.07
Prevalence	37.29%	17.18%
Test Inaccuracy[b]	9.16	5.12

[a]22-point scale (1 = *not serious;* 22 = *very serious*)
[b]22-point scale. Higher numbers indicate higher perceived chance of the test being inaccurate.

Table 2

Mean Scores on Associated Symptom and Risk Behavior Indices as a Function of Test Result

	Test result	
Recall measure	Positive	Negative
Associated symptoms	30.62	20.54
Risk behaviors	101.52	86.79

independent variables on this measure (Test Result, $F(1,75) = 1.62$; Certainty and Certainty × Result Fs < 1).

Subjects were also presented with two checklists. On the first, they were asked to report the number of days within the previous month they had experienced each of 11 "symptoms that have been associated with TAA deficiency." We computed an index of associated symptom recall by summing the number of symptom days reported. An analysis of the effect of test result on this measure revealed a nonsignificant trend, $F(1,62) = 2.84, p < .10$. Subjects with a positive test result tended to report more deficiency-associated symptoms than subjects with a negative test result (see Table 2). Neither the certainty main effect nor the Result × Certainty interaction approached significance.

Subjects also reported the number of days within the previous month they had engaged in each of nine behaviors "found to increase the risk of the development of TAA deficiency." Analysis of this measure yielded a significant main effect of test result, $F(1,67) = 4.71, p < .05$. Subjects who were told that their test result indicated the presence of the enzyme deficiency reported more risk behaviors than did other subjects (see Table 2). Other effects were not significant.

The correlation between risk symptoms and risk behaviors was positive and significant, $r = .40, p < .05$.

Within-Cell Correlations

One goal of the current study was to examine whether the lower ratings of seriousness displayed by individuals with a positive test result could be accounted for by either an inability to recall relevant symptoms or a heightened recall of nonserious symptoms. It is clear that subjects who

received a positive test result did not recall fewer symptoms than other subjects. Were the low-seriousness judgments among positive result subjects mediated by symptom recall? One possibility is that lower seriousness judgments are the product of the subjects' realization that previously experienced symptoms are trivial. To the extent that an individual recalled more nonserious symptoms, the disease might have been regarded as less threatening. From this perspective, subjects discount the seriousness of TAA deficiency because they infer that their minor symptoms indicate a minor illness.

To explore this possibility we computed within-cell correlations between judgments of seriousness and the associated symptom recall measure. As the correlations clearly indicate, seriousness judgments of subjects with a positive test result are not negatively correlated with symptom recall ($r = .23$, *ns*), as this trivial symptom-trivial disease explanation would predict.[4] Although a positive test result does lead individuals to recall more symptoms and behaviors consistent with that diagnosis, this heightened availability does not seem to be the critical mediator of judgments of seriousness. The correlation between associated symptoms and judgments of seriousness in the negative result group is especially interesting. Although this group, as a whole, rated TAA deficiency as relatively serious, subjects who recalled more symptoms tended to make lower seriousness judgments ($r = -.33$, $p < .05$, two-tailed). This negative correlation is significantly different from the positive correlation in the positive test group ($z = 2.14$, $p < .05$).

A stronger relation is evidenced between symptom reports and ratings of test inaccuracy. When the test result was negative, subjects tended to view the test as more inaccurate when they recalled more symptoms ($r = .38$). Not surprisingly, a positive test result was seen as more inaccurate when few symptoms were recalled ($r = -.33$). These two correlations are significantly different from one another ($z = -.2.82$, $p < .01$). Thus, subjects in both test result groups denigrated the validity of the diagnostic test more when their recall of symptoms appeared to be inconsistent with the diagnosis.

Other Measures

There were no significant differences between conditions on the combined-mood index or on any of the four mood items. The grand means on the four items were 6.3 for happy, 4.0 for worried, 6.8 for pleasant, and

[4]We also reanalyzed the seriousness, prevalence, and test accuracy judgments utilizing analysis of covariance. With risk symptoms and risk behaviors entered as covariates, the main effects of test result (diagnosis) remain highly significant ([p] < .003 in all cases).

4.2 for tense. Each label corresponds to the upper end of the 9-point scale. Worry was related to judgments of seriousness within the positive result condition $r = .58, p < .001$) but not within the negative result condition ($r = -.06$; $z = 2.76$, $p < .01$). In other words, subjects who were told they had tested positive for TAA deficiency reported less worry when they rated the deficiency as less serious.

Seven subjects requested the more elaborate follow-up test for TAA deficiency. All seven of these individuals were in the positive test result group. This difference in frequency as a function of test result is significant, $\chi^2(1) = 6.16, p < .05$. Six of the seven were in the positive-high certainty cell ($p = .06$, Fischer's exact test). Thus, only 1 of 18 subjects who received an unreliable positive test result requested the more definitive test.

Ratings of the examiner's (experimenter's) competence were generally high and did not vary significantly across experimental conditions. The grand mean of the competence ratings on the 9-point scale was 7.37 ($SD = 1.60$).

Discussion

The present study provides unique experimental evidence of denial following diagnosis. When faced with a positive diagnostic test result, subjects judged an enzyme deficiency as less serious and rated the test as less accurate when compared to subjects who received a negative test result. The lower judgments of seriousness among the positive (deficiency-present) group are not due to a relative inability to recall symptoms consistent with the diagnosis. In fact, the results suggest that recipients of positive test results selectively uncovered evidence in memory that tended to confirm the diagnostic label. Together, these data indicate that personally threatening information can initiate both denial and a confirmatory search of relevant memory. Each of these processes will be discussed in turn.

Denial

Subjects in the present study displayed three ways in which the denial of a health threat can occur. First, evidence was obtained that a minimization of the health threat occurred. We believe that the lowered seriousness judgments of subjects with a positive test result is direct evidence of minimization. A second form of denial is skepticism concerning the validity of the diagnosis. Strong evidence was also obtained for this form of denial in the tendency of subjects to denigrate the test's validity when the result was positive. Internal analyses indicated that these judgments were partially mediated by symptom recall. Subjects denigrated the validity of the

diagnostic test result more when their recall of symptoms appeared to be inconsistent with the diagnosis.

Suggestive evidence was provided that a third form of denial may have been operative as well. The lack of any difference between experimental groups in self-reported affect indicates that denial of affect might have occurred. These data may also be interpreted as evidence that the denial strategies discussed above successfully blunted negative affect. Among the subjects who received positive test results, those who minimized the seriousness of TAA deficiency also reported less worry. This mirrors the findings of Meyerowitz (1983), who reported that postmastectomy patients who minimized the seriousness of their illness reported less distress than other patients. Because the present research was not designed to examine this form of denial, further evidence is needed before our mood data can be conclusively attributed to a denial process.

The present results can also be couched in the terms proposed by Lazarus (1983) in his discussion of denial processes. Lazarus distinguishes between two kinds of denial that may occur in response to threats to health. Denial of *fact* is said to occur when the presence of the illness itself is denied. A striking example of this is described by Croog, Shapiro, and Levine (1971), who reported that 20% of the hospitalized heart attack patients studied denied they had had a heart attack. In the present study, the denigration of the tests's validity can be seen as a denial of fact. If, from the subject's point of view, the test is inaccurate, there is a greater chance that bad news reflects only a benign false positive. Lazarus argues that this form of denial is often difficult to sustain in the face of substantial objective evidence.

Denial of *implication* is said to occur when an individual minimizes the often ambiguous implications of an illness (see also Janis, 1958). In the present context, subjects could concede that the test is fairly accurate but decide that the illness is not serious anyway. The possibility that some patients may use one but not both of these denial strategies is supported by an interesting finding in the current study: Among subjects who received a positive test result, the correlation between seriousness judgments and test inaccuracy judgments was not significant. Janis (1983) has argued that minimization occurs in "highly ambiguous situations of potential adversity where the probabilities of loss or danger cannot be ascertained at the moment, but must await subsequent events" (p. 36), an apt description of the situation faced by our subjects.

Confirmatory Search

The behavior and symptom recall data lend support to the notion that diagnosis can cause a patient to initiate an information search that produces

confirmatory evidence. Pennebaker (1982) already has presented evidence suggesting that the perception of current physical symptoms is the product of a selective search for hypothesis-confirming information. Our data indicate that diagnosis can initiate a selective search of illness-relevant memory as well. We also found that symptom memories mediate a patient's judgment of a test's accuracy. An understanding of these processes is of great importance because recent evidence indicates that symptom information is a critical component of the common-sense models of illness that mediate compliance with treatment regimens (Meyer, Leventhal, & Gutman, 1985). Because we found only weak evidence that this information search mediates judgments of seriousness, it appears that the processes of minimization and confirmatory search are independent and may serve different functions. This finding is consistent with Leventhal's model of self-regulation (e.g., Leventhal et al., 1984), which distinguishes between the processing of objective features of a disease and the processing of (and coping with) emotional reactions to it. Further research must determine how judgments of seriousness and symptom information combine to determine the behavior of patients following diagnosis.

The current study uncovered new evidence that diagnosis can also initiate a confirmatory search of behavioral information. Subjects who received a positive test result reported a higher frequency of behaviors that had been labeled as risk factors. This phenomenon may be a consequence of the "search for meaning" that follows medical bad news. In her work with patients diagnosed as having cancer, Taylor (1983) reported that 95% of the patients studied had developed a theory of why their cancer occurred. Furthermore, many of the causes mentioned concerned behavior patterns that could be modified through the patient's own efforts. Taylor suggests that successful coping may depend on the patient's often illusory belief that they exercise a great deal of control over the course of their illness. By focusing on the causal importance of their prior behavior, subjects in the current study may have heightened their own sense of control over their future health (Taylor, Lichtman, & Wood, 1984).[5]

The manipulation of diagnostic certainty had an impact only on requests for a definitive follow-up test. With one exception, all of the subjects who requested further testing were in the positive-high certainty group. Surprisingly, the manipulation of certainty had no effect on seriousness judgments or recall. Even subjects' perceptions of the test's accuracy were determined more by self-relevance (i.e., test result) than by information

[5]The recall bias observed here has implications for case control methods in epidemiology. Our data support the notion that cases may be more likely to report risk exposure (Raphael, 1987).

directly concerning test reliability. Although it is likely that subjects simply attended more to vivid than to pallid information (Nisbett & Ross, 1980), the ineffectiveness of the certainty manipulation can also be interpreted as another example of the preeminence of ego defense motives over the quest for accuracy. To some extent, the defensiveness and vividness explanations are not mutually exclusive. Vivid stimuli have been defined as "(a) emotionally interesting, (b) concrete and imagery-provoking, and (c) proximate in a sensory, temporal or spatial way" (Nisbett & Ross, p. 45). The outcome of a medical test easily meets these criteria. These criteria are also applicable, however, to most stimuli that could be perceived as ego-threatening. Furthermore, there is little evidence that vividness per se is an important determinant of judgments (Taylor & Thompson, 1982). If vividness is equated with salience, however, it is possible to argue that the manipulation of the test result attracted the full attention of subjects, producing a decrement of attention to the certainty manipulation (Fiske & Taylor, 1984). Because the current results may simply be the product of a weak manipulation, further research is needed to clarify the role of certainty information as a possible mediator of the impact of diagnosis.

False Consensus

In addition to its implications for theories of health beliefs, judgments, and behavior, the findings reported here also are relevant to the theoretical discussion of the false consensus effect. Subjects who were provided with a positive test result judged the enzyme deficiency as relatively common whereas those with a negative test result judged the same disorder as relatively rare. As suggested by Ross et al. (1977), one nonmotivational account of false consensus points to prior selective exposure to similar others as a determinant of biased consensus estimates. An individual may overestimate the number of people who have similar attitudes, for example, because he or she tends to affiliate with similar others. In the current study, however, differences in consensus estimates were obtained in a context that controlled for relevant prior experience and information availability.

The effect of diagnosis on prevalence estimates is consistent with the notion that motivational as well as cognitive factors underlie some false consensus phenomena (Goethals, 1986; Sherman, Presson, & Chassin, 1984). Because illnesses that are perceived as relatively common are also viewed as relatively benign (Jemmott et al., 1988; Jemmott et al., 1986), subjects' high prevalence estimates might also reflect attempts to minimize the seriousness of their ailment. The motivational account of false consensus also suggests that estimates will be relatively high for undesirable behaviors and relatively low for desirable behaviors. According to this

argument we are motivated to view our frailties as common and our gifts as unique. Although these data suggest that individuals are motivated to perceive a personal health flaw as common, further research is needed to determine whether the reverse is true for positive health qualities. Recent evidence does indicate that individuals frequently overestimate the commonality of health-risk behaviors and underestimate the commonality of health-promoting behaviors (Suls, Wan, & Sanders, 1988). [6]

Limitations

Some limitations of the present research should be mentioned. First, this study examines only the immediate consequences of one type of medical diagnosis. As others have suggested (e.g., Cassem & Hackett, 1971; Hamburg & Adams, 1967; Kubler-Ross, 1969), denial may often be the first in a sequence of coping strategies utilized by patients. Second, previous research indicates that defensiveness in the face of threatening information is most likely to occur when the individual is provided no means of dealing with the threat (Janis, 1984; Leventhal, 1970; Rogers, 1983). Under these conditions, avoidance or denial can be effective short-term strategies for attenuating maladaptive stress responses (Lazarus, 1983; Suls & Fletcher, 1985). In this experiment, subjects were given no information regarding the treatability of TAA deficiency or the pancreatic disorders it may induce. If subjects had been given such information, we would expect that defensiveness would be attenuated (Ditto, Jemmott, & Darley, 1988). Finally, this research has focused on a single health disorder, which, from our subjects' perspective, is not extremely serious. Defensiveness is likely to play an even more important role as objective seriousness increases (Levine & Zigler, 1975). Obviously, the experimental investigation of such effects is circumscribed by ethical considerations. Nevertheless, the relation between the seriousness of a diagnosed illness and denial is amenable to nonexperimental research in clinical settings.

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[6]Because the imagining of an event can increase its perceived likelihood (e.g., Carroll, 1978), it is also possible that our subjects' prevalence estimates were affected by a single-minded consideration of their own test results (Mullen et al., 1985).

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