From Rarity to Evaluative Extremity: Effects of Prevalence Information on Evaluations of Positive and Negative Characteristics

Peter H. Ditto
Kent State University

John B. Jemmott III
Princeton University

Experiments showed a scarcity principle in evaluative judgments such that the identical characteristic is evaluated more extremely the lower its perceived prevalence. In Study 1, Ss evaluated a fictitious medical condition that was described as either beneficial or detrimental to health and as occurring in either 30% or in one half of 1% of a test population. The condition was evaluated more extremely— as a more positive health asset or a more negative health liability—in the low-prevalence than in the high-prevalence conditions. Study 2 demonstrated the same effect in self-evaluations and with a different manipulation of perceived prevalence. Ss were told that they actually had the fictitious medical condition, that it was either beneficial or detrimental to their health, and either that they were the only 1 of 5 Ss who had it or that 4 of the 5 did. Low-prevalence Ss exhibited more extreme evaluative, affective, and behavioral reactions to the medical condition than did high-prevalence Ss.

The origins and validity of the scarcity principle are discussed, as are its implications for uniqueness theory, reactance theory, and social evaluation theories.

Whether an object or characteristic is considered desirable or undesirable and the extent to which it is valued or despised would seem less a function of the thing being evaluated than of the social context of the evaluator. This is true both in that evaluative judgments are ultimately a product of our socialization into a particular culture—the delusions characteristic of schizophrenia, for example, are seen as a divine gift in many societies—and, more central to the topic of this article, in that evaluative judgments are greatly affected by the features of the immediate social context in which they are made.

Many theorists have stressed this latter point (Crosby, 1982; Davis, 1966; Festinger, 1954; Hyman, 1942; Merton, 1957; Stouffer, Suchman, DeVinney, Star, & Williams, 1949), and Pettigrew (1967) coined the term social evaluation theory to describe the perspective this diverse body of work represents. According to Pettigrew, the basic tenets of social evaluation theories are that individuals learn about themselves by comparing themselves with others and that evaluations of personal characteristics—abilities, traits, skills, opinions, emotions, social statuses, and so on—greatly depend on the standards set by the people employed for comparison.

Perhaps the simplest kind of information that can be gleaned from social comparison is what has variously been called prevalence (Jemmott, Ditto, & Croyle, 1986), base-rate (Kahneman & Tversky, 1973), or consensus (Kelley, 1967) information: information about the number or proportion of people in a relevant population who possess a particular characteristic or engage in a particular behavior. Although little research has directly examined whether such simple and readily available information affects evaluations of personal characteristics, considerable indirect evidence suggests that it does.

Research on achievement attributions, for example, has shown that given the same level of performance, more ability is attributed to an actor the fewer the number of other people who are believed to be able to perform at a comparably high level (Frieze & Weiner, 1971). Thus, the ability to perform a particular feat, i.e., run a certain speed or jump a certain distance, should be evaluated more positively the fewer the number of other people who are also thought to be able to do so.

Although not dealing with evaluations of personal characteristics per se, research stimulated by commodity theory (Brock, 1968) provides consistent evidence. The theory states that a commodity (defined as any object or information that a potential possessor perceives as useful) will increase in valuation to the extent that it is perceived to be scarce. Brock reviewed several studies showing that the value of a communication (gauged by its persuasiveness) is increased when targets believe that few others are privy to the same message. Other research suggests that scarcity information has the same effect on the attractiveness of a variety of consumer items. Chocolate chip cookies (Worchel, Lee, & Adewole, 1975), leather boots and nylon hose (Fromkin, Olson, Dipboye, & Barnaby, 1971), pornographic materials (Fromkin & Brock, 1973; Zellinger, Fromkin, Speller, ...
& Kohn, 1975), and even simulated drug experiences (Fromkin, 1970) have all been evaluated more positively when they were perceived to be scarce than when they were perceived to be relatively common.

Several explanations have been offered for the increased valuation that accompanies perceived scarcity. Fromkin and Snyder (Fromkin, 1970; Fromkin & Snyder, 1980; Snyder & Fromkin, 1980) suggested that it stems from a need for uniqueness—a desire to perceive oneself as a unique and individuated member of society. They postulated that by possessing scarce objects, individuals can differentiate themselves from other people, and hence scarce commodities are valued for their individuating potential. Worchel et al. (1975) suggested a different but not incompatible account based on reactance theory (J. W. Brehm, 1966; S. S. Brehm & Brehm, 1981). They argued that scarce commodities limit individuals’ freedom to possess them and consequently cause reactance. Increased attraction to and evaluation of scarce commodities are seen as manifestations of this reactance. Cialdini (1985, 1987) has recently suggested a third, more cognitive explanation for why perceived scarcity affects a commodity’s attractiveness. He pointed out that because scarcity affects availability, what is less common often is more valuable. This frequently experienced relation between supply and demand may lead people to assume that if a commodity is scarce it must be valuable. Cialdini (1987) referred to this assumption as the scarcity heuristic and suggested that its automaticity is often used against us by compliance professionals in such price-increasing tactics as the “limited edition” label.

Each of these accounts can be generalized to evaluations of positive or desirable personal characteristics, and each predicts that, like persuasive communications and consumer items, a desirable characteristic should be evaluated more positively the lower its perceived prevalence. But what about evaluations of negative or undesirable characteristics? The three accounts described above were developed to explain the effects of perceived scarcity on evaluations of objects and information, the possession of which is almost always desirable, and thus make no explicit predictions regarding negatively valenced evaluative targets.

However, several lines of research converge to suggest that prevalence information has a quite different relation to evaluations of undesirable characteristics. First, implicit in uniqueness theory is the assumption that what people desire most is not to differentiate themselves along any dimension, but rather to differentiate themselves along positive dimensions (Snyder & Fromkin, 1980). Research on the false consensus–uniqueness phenomenon clearly illustrates the limits of the uniqueness motivation. These studies have shown that, presumably because of self-enhancement concerns, people exaggerate the rareness of their positive attributes and behaviors, but exaggerate the commonness of their negative attributes and behaviors (Goethals, 1986; Sherman, Presson, & Chassin, 1984). It seems that uniqueness is preferred when positive characteristics are implied, but consensus or self–other similarity is preferred when one’s actions or attributes have negative implications.

Second and more directly, evidence suggests that perceived scarcity may have opposite effects on evaluations of positive and negative characteristics. For example, the Frieze and Weiner (1971) study mentioned earlier found that when subjects observed a successful performance, they attributed more ability to the performer if consensus was low (few others succeeded) than if it was high (many others succeeded), but when subjects saw an unsuccessful performance, low consensus information led them to attribute a lower rather than higher ability level to the performer. Consistent with this latter finding, both experimental and correlational studies have shown that health disorders (presumably undesirable characteristics) are perceived to be more serious (i.e., more negative) the lower their perceived prevalence (Jemmott, Croyle, & Ditto, 1988; Jemmott et al., 1986; Meghani, 1987).

Taken together, this research suggests that the effect of prevalence information on evaluative judgments is more general than previously conceived. Rather than simply leading to more positive evaluative judgments, perceived scarcity seems to lead to more extreme evaluative judgments: more positive if the evaluative object is positive or desirable but more negative if the evaluative object is negative or undesirable.

But why might perceived scarcity lead to more extreme, rather than simply more positive, evaluative judgments? One possibility is that the judgment rule relating perceived prevalence to evaluation is also more general than originally conceived. It may be that what is automatically assumed from low prevalence information is not greater value specifically, but rather the more general notion of evaluative extremity. In other words, our experience tells us not only that what is less common is usually more valuable or positive, but more generally, that what is less common is usually more extreme. This is because in many familiar evaluative domains, evaluative extremity is, in large part a social, prevalence-defined concept.

As Cialdini (1985, 1987) pointed out in the case of commodities, the economic logic of “supply and demand” dictates that, all else being equal, as supply (prevalence) decreases, demand (value) tends to increase. Attributional logic dictates the same type of prevalence–evaluative extremity relation in ability-linked performances. When evaluating performance on a task, evaluative extremity is attributionally mediated, and thus prevalence information has a normatively prescribed role (Frieze & Weiner, 1971; Heider, 1958). If many people perform well on a task, attributional logic states that a good performance should be attributed to low task difficulty. If few people perform well, however, the cause of the good performance should be identified as high ability rather than low task difficulty and a more positive evaluation of the performance is suggested. The same logic suggests more negative evaluations of a poor performance the fewer the number of people who perform equally poorly.

In both these familiar domains then, evaluative extremity is largely prevalence defined, and thus the prevalence of an object or ability is generally a reliable indicator of its evaluative extremity. Because prevalence information is often a reliable indicator of evaluative extremity, people may come to automatically infer evaluative extremity from perceived prevalence. For example, if all that is known about some object or characteristic is that it is rare, people may rely on a scarcity principle to infer an extreme evaluation. A rare health disorder may be assumed to be serious, a rare commodity may be assumed to be valuable.

This more general scarcity heuristic provides a single expla-
nation for the effects of prevalence information on the evaluation of both positively evaluated commodities and negatively evaluated characteristics like health disorders. It also makes general predictions regarding the effects of prevalence information on evaluations of all kinds of characteristics, objects, and events.

This article focuses on how prevalence information affects the evaluation of health characteristics. Two experiments are reported that examined, within a single design, the effects of prevalence information on evaluations of both positive and negative health characteristics. The experiments manipulated perceived prevalence in different ways and considered individuals' perceptions of both their own characteristics and those of others. In both studies, the operation of a scarcity heuristic in evaluative judgments predicted that the identical characteristic would be evaluated more extremely the lower its perceived prevalence.

Study 1

Study 1 examined how summarized prevalence statistics affect evaluations of a health characteristic. Subjects read descriptions of a fictitious medical condition. Half the subjects were led to believe the condition was positive—that it was beneficial to health—and half that it was negative—that it was detrimental to health. Orthogonally, half of the subjects read statistical information indicating that the condition was relatively high in prevalence, whereas the others read information indicating that it was relatively low in prevalence. We predicted that the medical condition would be evaluated more extremely in the low-prevalence conditions than in the high-prevalence conditions. When the condition was described as a positive characteristic, it should have been seen more positively when it was thought to be relatively rare than when it was thought to be relatively common, but when the condition was described as a negative characteristic, it should have been seen more negatively when it was thought to be relatively rare than when it was thought to be relatively common.

Method

Subjects

Subjects were 74 undergraduates enrolled in an introductory social psychology course at Princeton University. No data on the sex of subjects were collected.

Materials and Procedure

As part of a class assignment on heuristic decision making, students were asked to answer a series of questions most of which were originally cited in Tversky and Kahneman (1974). The experimental materials were included as one question in this series.

The students read one of four versions of a short vignette modified from materials used in Jemmott et al. (1986). The basic vignette described a fictitious medical condition called thioamine acetylase (TAA) presence that was said to affect pancreatic functioning. It stated that TAA was an enzyme that was recently discovered by the National Institutes of Health (NIH). It went on to state that, if present in the body, TAA was found in saliva and other secretory fluids (e.g., breast milk and bronchial, gastrointestinal, and nasal secretions), but that research had indicated that TAA was present in some people's secretory fluids and totally absent in the secretory fluids of others. At this point, the information in the four versions of the vignette began to differ.

Manipulating the valence of the condition. Subjects receiving the positive version of the vignette read the following:

In addition, further research has uncovered that people whose secretory fluids contain TAA seem to be relatively protected against a variety of pancreatic disorders. In fact, recent studies indicate that individuals who possess the TAA enzyme are several times less likely to experience pancreatic disease than individuals without the TAA enzyme.

In contrast, subjects receiving the negative version of the vignette were told that individuals with TAA presence seem to be relatively susceptible to a variety of pancreatic disorders, and that research indicated that these individuals were several times more likely to experience pancreatic disease than individuals without the TAA enzyme.

Manipulating the prevalence of the condition. The vignette went on to state that about six months ago, a simple diagnostic test had been developed that could determine the presence or absence of TAA in an individual's saliva. It said that during the testing and refinement of this procedure a large sample of people had been tested for the presence of the enzyme. Subjects receiving the high-prevalence version of the vignette then read the following: "These preliminary tests indicate that TAA presence is actually quite common, occurring in about 30% of the test population." Subjects receiving the low-prevalence version were instead told that the preliminary tests had indicated that TAA presence was quite rare, occurring in only about one-half of 1% of the test population.

Eighteen subjects were randomly assigned to the positive, high-prevalence and negative, high-prevalence conditions and 19 subjects to the positive, low-prevalence and negative, low-prevalence conditions.

Dependent Measure

After reading the vignette, subjects rated TAA presence on a 21-point scale from very unhealthful (i.e., life-threatening, a serious health problem) to very healthful (i.e., health-promoting, an important health asset). On completion, the students were fully debriefed.

Results

A Valence (positive or negative) × Prevalence (high or low) analysis of variance (ANOVA) on subjects' ratings of the healthfulness of TAA presence reveals a valence main effect. As expected, subjects in the positive conditions rated TAA presence as significantly more healthful (M = 14.56) than did subjects in the negative conditions (M = 7.13). F(1, 70) = 101.49, p < .0001. The prevalence main effect is nonsignificant (F < 1).

As predicted, there is a significant Valence × Prevalence interaction, F(1, 70) = 5.16, p < .03, indicating that subjects in the low-prevalence conditions gave more extreme ratings of the healthfulness of TAA presence than did subjects in the high-prevalence conditions (see Figure 1). Simple effects analyses confirm that within the positive conditions, low-prevalence subjects rated TAA presence as marginally more healthful (M = 15.31) than did high-prevalence subjects (M = 13.77), F(1, 70) = 2.20, p < .15, but within the negative conditions, low-prevalence subjects rated it as marginally less healthful, or more unhealthful, (M = 6.26) than did high-prevalence subjects.
(M = 8.05), F(1, 70) = 2.99, p < .09. It is important to note that although the extremizing effect of low-prevalence information is somewhat more reliable in the negative conditions than in the positive conditions, this should not be taken to indicate that the magnitude of the effect is significantly stronger in the former case than in the latter. If the effect sizes associated with the simple effects are computed as correlation coefficients, a comparison reveals that the size of the prevalence-information effect is not significantly different in the positive (r = .17) and negative (r = .20) conditions (z < 1).

**Discussion**

The results of Study 1 provide support for the prediction that low-prevalence information has opposite effects on evaluations of positive and negative characteristics. Consistent with the operation of a scarcity heuristic, TAA presence was evaluated more extremely—as a more positive health asset or as a more negative health liability—when its prevalence was said to be low than when its prevalence was said to be high.

Two limitations of this study should be mentioned. First, it might be argued that high-prevalence subjects evaluated TAA presence less extremely, not simply because of the prevalence of the condition, but also because of its unfamiliarity. High-prevalence subjects might have reasoned that one usually hears about medical conditions that are both extreme and widespread, and thus, because they had never heard of TAA presence, it must not be very extreme. This is unlikely, however, because the vignettes explicitly stated that TAA presence had only recently been discovered and this information should have provided subjects with an adequate and salient explanation for why they had never heard of it (Jemmott et al., 1986). But no independent check on whether subjects noticed this information was collected. Future studies should include such a check.

Second, subjects in Study 1 evaluated a medical condition that they read about in a short vignette and thus probably felt very little self-involvement in the judgment. This low level of involvement is, of course, typical of many of the evaluative judgments people make every day, for example, when one reads about a health condition in a newspaper or magazine. However, the question that lies at the heart of most social evaluation theories concerns how we evaluate our own characteristics. Judgments about the self, particularly those with evaluative implications, are subject to a variety of cognitive and motivational perturbations (e.g., Croyle & Sande, 1988; Ditto, Jemmott, & Darley, 1988; Jones & Nisbett, 1971) that make them psychologically quite different from the simple evaluative judgments made by subjects in Study 1. Thus, Study 2 turns to the topic of self-evaluation.

**Study 2**

Study 2 examined how the perceived prevalence of one's own characteristics affects how they are evaluated. Following the logic of the scarcity principle, we predicted that one's positive characteristics should seem more positive and one's negative characteristics more negative, the fewer the number of other people who are also believed to possess them.

These differences in evaluation should, in turn, affect people's emotional and behavioral reactions to their characteristics. The fewer people who are perceived to share a negative characteristic, the more negative that characteristic should be perceived to be and, consequently, the more negative affect it should engender. The fewer people who are perceived to share a positive characteristic, however, the more positive that characteristic should be perceived to be and, consequently, the more positive affect it should engender. Similarly, people may behave differently with regard to rare and common characteristics. The more extreme evaluations given to rare characteristics may make them more likely than common characteristics to trigger a behavioral response. This seems most likely to occur and would have especially important implications in people's evaluations of negative conditions like health disorders. Because of the effect of prevalence information on evaluation, individuals who have a particular health disorder may be less likely to seek information about it or treatment for it if they believe many people have it than if they think very few have it (Zola, 1966).

Study 2 used a paradigm first developed by Jemmott et al. (1986) in which subjects are led to believe that they actually have the TAA enzyme condition. In the present experiment as in Study 1, half of the subjects were led to believe TAA presence was a positive condition and half that it was a negative condition; half were led to believe it was relatively common and half that it was relatively rare. However, rather than manipulating the perceived prevalence of TAA presence with summarized prevalence statistics as in Study 1, Study 2 varied perceived prevalence by varying the number of subjects present in the laboratory who apparently had the condition (Jemmott et al., 1986). The basic predictions were again that TAA presence would elicit more extreme evaluative, affective, and behavioral reactions in the low prevalence than in the high-prevalence conditions.

**Method**

**Subjects**

Subjects were 66 undergraduates who volunteered for a study on the health characteristics of college students. The results from 6 subjects

![Figure 1. Mean ratings of the healthfulness of Thioamine Acetylase (TAA) presence by experimental condition, Study 1. Higher numbers indicate greater perceived healthfulness.](image-url)
were discarded after participation because they voiced suspicions about the experimental manipulations. Thus the final sample consisted of 60 subjects, 30 men and 30 women.

**Procedure**

Subjects were initially contacted by telephone and discreetly administered a hypochondriasis scale (Pilowsky, 1967). Individuals who scored two or more standard deviations above the normal mean were excluded from participating.¹

Subjects were told that the study was sponsored by the Health Awareness Project (HAP), ostensibly a federally funded health organization attempting to gauge the health characteristics of undergraduates and to increase their awareness of health-related issues. The experiment was conducted in a laboratory replete with medical trappings—health posters, stethoscopes, eye charts, and the like—and the subjects were met by a male experimenter wearing a white lab coat.

Subjects were told that they would complete some health questionnaires and would undergo several medical tests, some standard, like blood pressure, eyesight, and hearing tests, and some recently developed, like the TAA saliva reaction test. The experimenter then measured subjects’ blood pressures, and ushered each subject into one of five individual soundproof booths, where a computer-assisted hearing test was to be administered. Subjects were tested 1 to 4 at a time, but all were led to believe that 5 subjects were present in the booths.

When subjects were seated in the booths, the experimenter (actually a prerecorded tape) explained over an audio system that because of a microcomputer problem the hearing test would be delayed, that they should start completing a lengthy medical questionnaire they had been given, and that he would contact them when the hearing test was ready to begin.

After a short delay, subjects were individually randomly assigned to hear one of four versions of an audio tape. Each version corresponded to one of the experimental conditions.²

The taped experimenter stated that because the computer malfunction was taking longer to repair than anticipated, they would now proceed to administer the TAA saliva reaction test. He explained that the test was described in a booklet, which he instructed them to read while he read it to them over the audio system.

The booklet stated that the TAA saliva reaction test was a recently developed test designed to detect the presence of TAA in saliva and other secretory fluids. As in Study 1, TAA was said to have been recently discovered, the information stating that TAA presence was recently discovered, the information indicating that the inclusion of TAA presence would not seem unusual.

**Manipulating the valence of the condition.** Subjects randomly assigned to the positive conditions then read and heard the following:

Finally, these researchers found that, although the presence of TAA has no perceptible effects of its own, people whose secretory fluids contain TAA seem to be relatively protected against a variety of pancreatic disorders. In fact, preliminary research indicates that individuals whose secretory fluids contain TAA are several times less likely to experience pancreatic disease than individuals whose secretory fluids do not contain TAA.

Subjects randomly assigned to the negative conditions were told instead that people whose secretory fluids contained TAA were relatively susceptible to a variety of pancreatic disorders and that preliminary research indicated that they were several times more likely to experience pancreatic disease than individuals without TAA.

The booklet then went on to state that about six months ago, a chemically coated test paper was developed that reacts to the presence of TAA and, therefore, can be used to detect its presence or absence in saliva and other secretory fluids. It said that if TAA reactive paper came in contact with saliva that contained TAA, it would turn from its normal yellow to a dark green.

The experimenter then told the subjects how to self-administer the test. Subjects were told to rinse their mouths with a cup of mouthwash, purportedly to cleanse their mouth of any food residue that might contaminate the test. They were told next to place a small amount of saliva in a cup, to take out a strip of the TAA test paper, and to rub the test paper in the saliva. They were then told to wait 30 s for color development to be completed.

In fact, the test strip turned green for all subjects because, unknown to them, it was glucose-sensitive paper and a small amount of glucose had been added to the mouthwash. In this way, all subjects were led to believe that they had TAA presence.

**Manipulating the prevalence of the condition.** At this point the experimenter stated that he needed to get a tally of the number of subjects who actually had TAA presence and asked the subjects to flip on their indicator lights if the test had indicated that they had the condition. Subjects randomly assigned to the high-prevalence condition were told that the lights indicated that 4 out of the 5 of them had TAA presence. Subjects randomly assigned to the low-prevalence condition were told instead that the lights indicated that only 1 out of the 5 of them had TAA presence.

**Dependent Measures**

After reporting the tally to subjects, the experimenter apologetically explained that the computer problem was still not solved. He suggested that subjects complete the remaining questionnaires while he continued to work on the problem.

**Healthfulness and prevalence of TAA presence.** The first questionnaire concerned “people’s beliefs about physical conditions.” Subjects responded to questions about 12 physical conditions, one of which was TAA presence. The two key questions were (a) What is your estimate of the percent of the college-age population that has had (or presently has) this condition? and (b) In your opinion, how unhealthful or healthful is it to have this condition? This last question was answered on a 15-point scale from very unhealthful/a serious health problem to very healthful/ an important health asset. A few obscure conditions (e.g., systemic lupus erythematous) were included among those on the questionnaire so that the inclusion of TAA presence would not seem unusual.

**Self-reported mood.** The next questionnaire presented subjects with 24 mood descriptive adjectives and asked them to indicate from very slightly or not at all (1) to very much (5) the extent to which each word described “how you feel right now.” Six of these adjectives were combined to form an index of the type of affect (i.e., fear-anxiety) likely to be caused by medical diagnoses. These six items were jittery, nervous, scared, afraid, ashamed, and distressed.

**Check on recent discovery information.** Subjects next completed the Quick Health Quiz, ostensibly to test their recall for information given to them during the procedures. To check on whether subjects noticed the information stating that TAA presence was recently discovered, the final item in the quiz asked subjects to complete the following sentence without looking back through the materials: “NIH researchers discovered the effects of TAA presence ______.” They were given two responses to choose from: (a) very recently or (b) a long time ago.

¹ Four potential subjects were excluded for this reason.

² After the prevalence manipulation was removed, 12 judges rated each of the four tapes on nine evaluative dimensions and on modified versions of the major dependent measures. Evaluations of the tapes did not differ (all Fs < 1).
Information seeking. Finally, subjects completed the HAP Services Form, which gave them the opportunity to sign up to receive any of a number of informational services offered by HAP. Services were listed concerning several medical conditions including TAA presence. Because of the different meaning attached to TAA presence in the positive and negative conditions, the services offered concerning it differed slightly by condition. In the negative conditions, three TAA related services were offered: a free pamphlet, a booklet costing 50 cents, and a free physical examination including a complete pancreas work-up. In the positive conditions, only the pamphlet and booklet were offered. Also, because previous research (Jemmott et al., 1986) suggests that the perceived treatability of a health disorder affects information-seeking behavior, an attempt was made in the negative conditions to suggest that ameliorative actions were possible.

Debriefing

On completion of the dependent measures, subjects were ushered out of the booths and put through a careful process debriefing (Ross, Lepper, & Hubbard, 1975). They were told that TAA did not exist, that the saliva test had been engineered so that the test strip always turned green, and that the test had no bearing on their susceptibility to pancreatic disease. The reasons for the deception and the various experimental conditions were explained, and subjects were shown the random number table used to assign them to conditions. Any remaining questions the subjects had were answered, they were then thanked, paid for their participation, and dismissed. Subjects indicated little if any distress regarding the procedure during the debriefing.

Results

Manipulation Checks

The valence manipulation was successful. A Valence (positive or negative) X Prevalence (high or low) X Sex of Subject (male or female) ANOVA of subjects' ratings of the healthfulness of TAA presence reveals that subjects in the positive conditions rated TAA presence as significantly more healthful ($M = 11.90$) than did subjects in the negative conditions ($M = 7.06$), $F(1, 52) = 116.87, p < .0001$. The prevalence manipulation was also successful. Subjects in the high-prevalence conditions estimated that a greater percentage of the college-age population had TAA presence ($M = 72.13\%$) than did subjects in the negative conditions ($M = 17.76\%$), $F(1, 52) = 294.82, p < .0001$. No other effects for subjects' estimates of the prevalence of TAA presence were significant. Finally, 100% of the subjects correctly remembered the information stating that TAA presence was recently discovered.

Evaluation of TAA Presence

As in Study 1, the key prediction in this experiment was that subjects would evaluate TAA presence more extremely when it was perceived to be relatively rare than when it was perceived to be relatively common. A significant Valence X Prevalence interaction on subjects' ratings of the healthfulness of TAA presence provides strong support for this prediction, $F(1, 52) = 11.05, p < .002$. As can be seen in Figure 2, within the positive conditions, low-prevalence subjects rated TAA presence as more healthful ($M = 12.46$) than did high-prevalence subjects ($M = 11.33$), $F(1, 52) = 3.19, p < .08$, but within the negative conditions, low-prevalence subjects rated it as less healthful ($M = 6.20$) than did high-prevalence subjects ($M = 7.93$), $F(1, 52) = 8.44, p < .01$. Again, although the prevalence-information effect is somewhat more reliable in the negative conditions than in the positive conditions, a comparison of the effect sizes associated with the simple effects reveals that they are not significantly different (positive condition $r = .24$, negative condition $r = .37$), $z < 1$. No other effects in the ANOVA are significant.

Self-Reported Mood

Subjects' ratings of the six items composing the fear-anxiety index (jittery, nervous, scared, afraid, ashamed, and distressed) were averaged, and the ANOVA on this index again reveals the predicted Prevalence X Valence interaction, $F(1, 52) = 4.58, p < .04$. As can be seen in Figure 3, within the positive conditions, low-prevalence subjects reported somewhat less fear-anxiety ($M = 1.07$) than did high-prevalence subjects ($M = 1.27$), $F(1, 52) = 1.26, p < .30$, but within the negative conditions, low-prevalence subjects indicated marginally more fear-anxiety ($M = 1.61$) than did high-prevalence subjects ($M = 1.22$), $F(1, 52) = 3.60, p < .07$. Again, the effect sizes associated with the positive and negative condition simple effects do not differ significantly (positive condition $r = .15$, negative condition $r = .25$), $z < 1$. No other effects in the ANOVA are significant.

Information Seeking

Because subjects in the positive and negative conditions were offered slightly different informational services, their information seeking.
the present study provided little incentive for these subjects to seek to be strong for subjects in the positive conditions because the evidence is believed by themselves to possess it. This tendency was not unexpected in the presence of the social environment who share one's characteristics can significantly affect how those characteristics are evaluated. Consistent with the results of Study 1, subjects evaluated TAA presence more extremely when they believed they were the only ones in the laboratory who had the condition than when they believed that three other subjects also had it. In addition, there was evidence that the perceived prevalence of TAA presence affected subjects' mood. Subjects in the low prevalence conditions reported more extreme affective reactions than did subjects in the high prevalence conditions. This was particularly true in the negative conditions, where the knowledge that other people also had TAA presence seemed to have a comforting effect. Misery does seem to love miserable company (Schachter, 1959). Finally, Study 2 shows that the perceived prevalence of a health characteristic can affect the behavior of people who believe themselves to possess it. This tendency was not expected to be strong for subjects in the positive conditions because the present study provided little incentive for these subjects to seek information about their condition. However, subjects in the negative conditions sought more information about TAA presence when they believed the condition was relatively rare than when they believed it was relatively common. This finding supports anecdotal evidence provided by Zola (1966) suggesting that cultural and ethnic differences in symptom reporting might be due in part to differences in the symptom's prevalence rate within the different populations. This last finding is particularly striking given that subjects in both the high- and low-prevalence conditions had available to them exactly the same medically significant information regarding TAA presence, including information (contained in the titles of the informational services) implying that the condition was probably treatable. The only difference in information available to the two groups of subjects was the prevalence of TAA presence in each subject's five-person subject group. Yet this simple piece of social information was powerful enough to create significant differences in subjects' likelihood of seeking information about an apparently treatable medical condition.

**General Discussion**

The research reported here demonstrates that prevalence information plays a significant role in how we evaluate personal characteristics. In two experiments, subjects evaluated health characteristics more extremely the lower their perceived prevalence. This finding was obtained with both desirable and undesirable characteristics, with two different manipulations of perceived prevalence, and regardless of whether the subject believed that he or she had the characteristic. Other research has shown prevalence information to have a similar effect on evaluations of a variety of informational and consumer commodities (e.g., Brock, 1968; Fromkin & Snyder, 1980). We suggest that many of these findings can be explained by positing a simple and general scarcity heuristic underlying evaluative judgments such that, under conditions of uncertainty, the perceived prevalence of an object or characteristic is used to infer its evaluative extremity.

It should be noted, however, that the operation of a scarcity heuristic in evaluative judgments is not incompatible with the operation of either reactance or uniqueness motivations. When evaluating desirable objects and characteristics not in one's possession, perceived scarcity may result in increased attractiveness because of reactance. In fact, the data reported here do not rule out the possibility that reactance processes were operating uniquely, conditions of uncertainty, the perceived prevalence of an object or characteristic is used to infer its evaluative extremity.

A more informal inspection of the kinds of services requested by high- and low-prevalence subjects provides additional illustration of subjects' differential reactions to the "common" and "rare" disorders. In the high-prevalence condition, all but 1 of the requests for information was for the pamphlet. Only 1 subject requested the more costly booklet and no one requested the physical exam. In the low-prevalence condition, on the other hand, 3 subjects requested the booklet and 4 requested the physical exam. In addition, 2 subjects requested both the pamphlet and the exam and 2 others requested all three services. Thus, TAA presence clearly provoked a more vigorous behavioral reaction when subjects thought they alone among the subject group had the condition.
on some of the subjects in our studies. Reactance theory, however, cannot account for the full pattern of data reported here. It is difficult to construct a reactance theory explanation for the effects of perceived scarcity on evaluations of undesirable characteristics. Presumably, most people do not wish to have a health disorder or, for that matter, any other undesirable characteristic. Thus, it is difficult to conceive how the desire to restore one's freedom might enhance or detract from a negative characteristic's attractiveness. A freedom restoration account also cannot explain why perceived scarcity would enhance the attractiveness of a desirable characteristic already in an individual's possession, as in Study 2.

Similarly, uniqueness motivation cannot be ruled out as an explanation for the extremizing effect of perceived scarcity on evaluations of positive characteristics. There are good data to support the role of uniqueness striving in the valuation of scarce experiences. Fromkin (1970), for example, showed that subjects whose feelings of uniqueness had been experimentally minimized valued scarce experiences more than other subjects. However, like reactance theory, uniqueness theory cannot explain the effect of perceived scarcity on evaluations of negative characteristics. Uniqueness theory has also never explicitly incorporated the fact that when faced with negative characteristics or behaviors, people strive to seem similar to others rather than different from them (Goethals, 1986; Sherman et al., 1984).

The scarcity principle posited here provides the complement that uniqueness theory needs to accommodate both these pieces of data. According to uniqueness theory, it is the motivational process of need for uniqueness that precedes and creates the evaluative differences between common and rare stimuli. The scarcity heuristic account posited here simply turns this reasoning around. That is, we suggest that in many cases it is not the motivational process that creates the evaluative differences, but rather, it is the evaluative differences that precede and subsequently drive the motivational process. According to our account, the evaluative differences between rare and common stimuli arise via a simple judgment rule: rarity implies evaluative extremity. Once these evaluative differences are established, however, they may engender motivational processes such as people's general desire to see themselves more positively (Allport, 1937; Heider, 1958) that may, in turn, complement or conflict with the uniqueness motivation. Accepting the priority of the scarcity principle can thus account for both the differential effects of prevalence information on positive and negative characteristics (direct products of reliance on a scarcity heuristic) and the limitation of uniqueness-enhancing processes to desirable evaluative targets. Because desirable objects and characteristics are evaluated more positively when they are perceived to be rare, self-enhancement desires should lead people to prefer to be unique (and therefore more positive) when positive evaluative objects are concerned. Undesirable characteristics, however, are perceived more negatively when they are thought to be rare than when they are thought to be common. When negative characteristics are concerned then, self-enhancement desires should lead people toward a preference for similarity rather than uniqueness.

In a sense, this argument views need for uniqueness as closely related to (and in the case of undesirable characteristics, limited by) people's general desire to maintain a positive view of self. It is not incompatible with the idea that under many conditions people strive to be unique, nor with the fact that when an individual's uniqueness is clearly threatened, scarce objects and experiences may become especially attractive (i.e., that uniqueness, in and of itself, carries motivational value). Rather, we would argue that the present research makes explicit a basic social comparison principle that helps to explain why uniqueness is particularly attractive with regard to desirable objects and characteristics but is particularly unattractive when undesirable attributes are implied.

In summary, the findings we report do not provide direct evidence for the operation of a scarcity heuristic in evaluative judgments. However, the scarcity heuristic provides the most comprehensive and parsimonious accounting of the effects of perceived scarcity on both desirable and undesirable characteristics under both self-evaluation and other-evaluation conditions. Moreover, understanding the social comparison principle underlying the scarcity heuristic may help to refine the predictions of uniqueness theory and more clearly define its boundary conditions.

**Accuracy and the Scarcity Heuristic**

Because the prevalence of an object or characteristic is often a reliable indicator of its evaluative extremity, reliance on a scarcity heuristic should usually lead to accurate judgments. It seems unlikely that a heuristic would be maintained if it did not have some validity (Nisbett & Ross, 1980; Tversky & Kahneman, 1974). In fact, people's tendency to infer evaluative extremity from perceived prevalence represents what is perhaps the most basic principle of social evaluation. In many domains, people can evaluate themselves only by comparing themselves to others (Festinger, 1954). A score of 86 on an exam has little or no evaluative meaning independent of its prevalence. It can only be evaluated socially—by comparing it with the scores of others. Similarly, commodities like diamonds, stamps, and coins have little objective value—their value is largely a function of how many people can or do possess them. In these domains, the use of prevalence information to infer evaluative extremity is accurate almost by definition. All else being equal, the identical exam score is better (or worse) the fewer the number of people who score comparably high (or low), and the same flawed stamp is more valuable the rarer its mistake.

Because evaluative extremity in most domains is socially defined, it seems that this prevalence-based definition of evaluation is generalized to people's judgments about health characteristics, where a social definition of evaluation does not apply. As a simple illustration, if a flawed stamp suddenly becomes less common—all the others are destroyed in a warehouse fire, for example—it just as suddenly becomes more valuable. If, however, a health disorder becomes less common somehow—smallpox, for instance, has been virtually eradicated worldwide—it seems strange to think that it consequently becomes a more serious condition. The seriousness of a health condition's physical effects is completely independent of the condition's prevalence.
Yet it seems that people evaluate health disorders in much the same way that they evaluate other types of personal characteristics. For example, just as failing a math test is less worrisome if many of one's classmates have also failed, failing a hypertension screening test may seem less serious if many of one's friends or colleagues receive similar diagnoses. The former judgment seems appropriate. In the latter case, however, it should be clear that the prevalence of the diagnosis in no way diminishes the seriousness of its import. Yet the results from Study 2 suggest that not only will an apparently common diagnosis be viewed as less serious than the same diagnosis when it appears more rare, but more important, it will also be less likely than its rare counterpart to trigger a behavioral response.

Reliance on a scarcity heuristic in illness appraisals can clearly be problematic. Does this mean, however, that reliance on the perceived prevalence of a health disorder to determine its seriousness is entirely without validity? Not necessarily. Even though a health disorder is not more serious because it is relatively rare, it may still be that, overall, there is a negative correlation between the prevalence and seriousness of health disorders. Unfortunately, data on the actual relation between the prevalence and seriousness of health disorders are more difficult to obtain than may at first appear. To assess the relation, one would have to ascertain the actual prevalence and seriousness of all diseases and correlate the two. This task is made even more difficult because neither a disease's seriousness nor its absolute prevalence rate are easily measurable constructs. Seriousness, although a meaningful unidimensional construct for laypeople, is a complex and multidimensional construct to formally operationalize. Mortality rates might serve as a good rough indicator of the seriousness of some diseases, but may miss the finer gradations of seriousness existing in non-life-threatening disorders. Perhaps more problematic is the fact that prevalence rates differ greatly between demographic categories. If we assume that a health disorder's seriousness remains constant, then an inverse prevalence-seriousness relation may exist in some demographic categories but not in others. To our knowledge, the pertinent objective data to adequately assess an absolute prevalence-seriousness relation are not presently available.6

It is important to note, however, that independent of its accuracy, people's reliance on a scarcity heuristic has important behavioral implications. Whether evaluating a consumer item, a persuasive message, or a health disorder, people infer evaluative extremity from perceived rather than actual prevalence rates. Because of this, two individuals may differentially evaluate the identical object, message, or characteristic because of their differing beliefs about its prevalence. People's prevalence beliefs may differ (either from each other or from an actual prevalence rate) for a variety of reasons. Prevalence beliefs can be affected by differences in the often small samples from which they are initially derived (see Study 2; Tversky & Kahneman, 1971), by information-processing biases (Ross, Greene, & House, 1977), or by deliberate manipulations of prevalence perceptions by compliance professionals (Ciardini, 1985, 1987). Yet, whatever their origin or validity, the present research suggests that, once established, prevalence beliefs may often play an important role in an individual's evaluative, affective, and behavioral reactions in a variety of different situations.

Psychological Processes Enhancing the Perception of a Prevalence-Evaluative Extremity Relation

So far, we have argued that people use prevalence information to infer evaluative extremity because in many familiar evaluative domains, evaluative extremity is socially defined. However, the perceived correlation between prevalence and evaluative extremity may also be due in part to a more general intertwining of the concepts of frequency and evaluation. Four psychological processes may reinforce the perceived correlation between prevalence and evaluative extremity. Two moderate evaluations of frequently experienced stimuli, and two inflate the perception that rare occurrences are usually evaluatively extreme.

First, it is difficult to conceive of a frequent and evaluatively extreme occurrence because habituation moderates our evaluations of frequently experienced stimuli. A stimulus that initially receives an extreme evaluation will evoke a progressively less extreme reaction with frequent exposure. Thus, any class of stimuli that occurs frequently is likely, with time, to come to be evaluated moderately.

Second, the complexity with which people view frequently experienced stimuli may also lead to relatively moderate evaluations. Linville (1982, 1985, 1987) has convincingly argued that multiple evaluative criteria lead to an evaluative dilution effect in which countervailing evaluative components sum to a moderate evaluative judgment. Multiple evaluative criteria often result from the complex representations that are formed of frequently experienced stimuli (e.g., Linville, 1985; Linville & Jones, 1980). Thus, frequently experienced stimuli are likely to be viewed complexly and evaluated along many different dimensions. This should also lead commonly occurring objects and characteristics to be evaluated relatively moderately.

Third, the relatively pallid nature of infrequent and evaluatively moderate stimuli may lead to an inflation of the perceived scarcity-extremity relation. More attention is probably paid to rare and evaluatively extreme stimuli than to rare and evaluatively moderate ones (e.g., Combs & Slovic, 1979). In the health domain, for example, rare and serious health disorders are likely to receive extensive media coverage while rare and benign disorders lay buried in the pages of medical school textbooks. A similar disproportion of attention would be expected to be paid to positive, extreme characteristics and objects. Thus, the inherently pallid nature of rare and evaluatively moderate stimuli may enhance the perceived relation between rare and evaluatively extreme ones.

6 One suggestive piece of data, however, comes from a study in which we collected prevalence and seriousness judgments from practicing physicians (Jemmott, Croyle, & Ditto, 1988, Study 2). The physicians we tested showed no evidence of a negative prevalence-seriousness correlation in their judgments about health disorders. Although the judgments of physicians are clearly not an objective measure of the prevalence-seriousness relation, it seems curious that the most informed population does not show what is otherwise a very robust effect (Jemmott, Croyle, & Ditto, 1988, Study 1; Jemmott, Ditto, & Croyle, 1986; Meghan, 1987). One possible explanation is that physicians' familiarity with the actual prevalence rates and seriousness of diseases precludes them from reliance on simpler, less accurate heuristic strategies.
Finally, the perceived relation between rarity and extremity may also be enhanced through an illusory correlation based on paired distinctiveness (Jemmott et al., 1986). Chapman (1967) and later Hamilton and Gifford (1976) found that people tend to overestimate the extent to which distinctive stimuli co-occur. Rare stimuli are distinctive because of their infrequency. Extreme stimuli are distinctive because of their evaluative extremity. Thus, people's day-to-day experience with stimuli varying along these dimensions may lead to the formation of an illusory correlation between rare and extreme stimuli based on paired distinctiveness.

These processes, and our experience with domains in which prevalence and evaluation are logically related, probably contribute to a general intertwining of the concepts of frequency and evaluation. In turn, this general intertwining may form the basis for the more specific assumption that perceived prevalence is a reliable predictor of evaluative extremity.

More General Implications of the Present Research

Prevalence information has a substantial history in social psychology. It plays a major theoretical role in attribution processes (Jones & Davis, 1965; Jones & McGillis, 1979; Kelley, 1967) and has been of key interest in the psychology of prediction (Kahneman, Slovic, & Tversky, 1982). Interestingly, however, most research has suggested that it has relatively little impact on these types of judgments (Kahneman & Tversky, 1973; McArthur, 1976; Nisbett, Borgida, Crandall, & Reed, 1976). Although the research presented here does not contradict that conclusion, it does suggest that, under conditions of uncertainty, prevalence information may often have a significant impact on evaluative judgments.

Finally, this article makes explicit a simple yet fundamental principle implicit in most social evaluation theories. The idea that the prevalence of a characteristic affects its evaluation lies at the heart of more complex theoretical formulations such as relative deprivation ( Crosby, 1982; Davis, 1966; Stouffer et al., 1949). Although we have gone to considerable length to point out how reliance on a scarcity heuristic, particularly in the health domain, may lead to important misjudgments, we must reiterate the fact that these misjudgments result from what is essentially the occasional overapplication of a basic social comparison principle. The concepts of prevalence and evaluation are inextricably intertwined. Indeed, it is difficult to imagine a clear evaluation of most of our characteristics emerging in the absence of information about how many others also possess them. What the scarcity principle lacks in counterintuitiveness, it makes up for in its fundamental and pervasive nature. Prevalence information represents social information in its most basic form and the effect of prevalence information on evaluation represents the social nature of evaluation in its most basic form.

References

Jones, E. E., & Davis, K. E. (1965). From acts to dispositions: The attri-


Received December 21, 1987
Revision received December 22, 1988
Accepted December 27, 1988