
Making Sense: The Causes of Emotional Evanescence

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The mind of every man, in a longer or shorter time, returns to its natural and usual state of tranquillity. In prosperity, after a certain time, it falls back to that state; in adversity, after a certain time, it rises up to it. Adam Smith, *The Theory of Moral Sentiments*

Psychology and economics generally agree about the importance of two fundamental human motives, the desire to reduce uncertainty and the desire to obtain pleasure (though to be sure, there are differences in views between and within the fields on the definitions of these motives and the importance attributed to them). In this chapter, we will explore some overlooked implications of these two motives that lead to a paradox: People seek happiness, but as soon as they obtain it, psychological mechanisms are activated to reduce it. Unfortunately, there may be limits to the duration of the pleasure we obtain from positive life events.

That is the bad news. The good news is that these same mechanisms place limits on the duration of displeasure caused by negative life events. Humans are built in such a way that emotional reactions to positive and negative events wear off fairly quickly, more quickly than we think. We will first document that emotional reactions are, in fact, relatively short-lived, and then argue that (i) emotional evanescence is functional, allowing people to remain vigilant to important changes in the environment, and (ii) emotional evanescence is the byproduct of the human need to make sense out of the world and reduce uncertainty, which robs events of their emotional power. We will conclude with a discussion of some recent work on how to prolong emotional reactions to positive events, and with a discussion of the implications of our work for economic theory.

1. EMOTIONAL EVANESCENCE

To be sure some life events, such as the death of a loved one, can have emotional reverberations that last for years. And, some people are chronically depressed. There is considerable evidence, however, that emotional reactions to external

events are surprisingly short-lived, and that sooner rather than later, people return to their baseline levels of happiness.

In a study by Suh et al. (1996), for example, college students reported their level of subjective well being and whether a large number of positive and negative life events had occurred in the previous four years. Many of the students had experienced significant events in their lives. Fifty-five percent had experienced the end of a romantic relationship, 29 percent had experienced the death of a close family member, 52 percent had gained at least 10 lb, and 42 percent had been unable to locate a job. Eighty-two percent became involved in a romantic relationship that lasted at least two months, 20 percent became engaged or were married, and 28 percent were admitted to graduate school. If these events had occurred six months or longer in the past, neither the number of negative nor the number of positive events people experienced were correlated with people's subjective well being. If the events had occurred in the previous three months, the correlations with subjective well being were significant but modest (.25 for the number of positive events, $-.28$ for negative events). As Suh et al. put it, 'only recent events matter', and recent events did not matter very much (1996, p. 1091).

A number of other studies have examined people's reactions to specific events and found that on an average, their emotional reactions are surprisingly short-lived (Frederick and Loewenstein, 1999). Two major life events that have received a lot of attention are the death of a loved one, and winning a very large sum of money in the lottery. The literature on bereavement indicates that many people are either not affected at all by the loss of a loved one or recover relatively quickly from intense grief. One study found that 30 percent of parents who lost babies due to the sudden infant death syndrome never experienced significant depression. Another found that 82 percent of bereaved spouses were doing well two years after the death (Lund et al., 1989; Wortman et al., 1993). Similarly, winning huge sums of money in the lottery does not seem to make people happy for very long; in fact, there is some evidence that lottery winners are less happy after the major disruption of sudden wealth in their lives (Brickman et al., 1978; Kaplan, 1978).

These studies are surprising because they violate most people's intuitions about how long emotional reactions to such major events should last. None of them, however, specifically measured people's affective forecasts and compared them to the actual duration of the emotional events. We have done just this in several studies, in which people forecast how happy they will be at specified times after an emotional event, and these forecasts are compared to people's actual happiness at those time points. We have documented a robust *durability bias*, which is the tendency for people to overestimate the duration of their reactions to emotional events. People have exhibited the durability bias when people predict their emotional reactions to major life events (e.g., achieving academic tenure, being denied tenure, the end of a romantic relationship), as well as more minor events (e.g., receiving negative feedback on a personality test, watching a favorite sports team win or lose a game). The durability bias has been found for both negative and positive events (Gilbert et al., 1998; Wilson et al., 2000).

1.1. Why are Emotional Reactions Short-Lived?

A number of reasons have been offered for why emotional reactions to external events do not last for very long. These explanations include the view that happiness is more of a dispositional trait than a reaction to external events (Costa and McCrae, 1984; Lykken and Tellegen, 1996); that people adapt to repeated experiences of the same event, because that event becomes the baseline to which new experiences are compared (Brickman and Campbell, 1971; Parducci, 1995; Kahneman and Tversky, 1979); that happiness results more from the pursuit of a goal than from the attainment of a goal (e.g. Davidson, 1994; Diener, 2000; Emmons, 1986; Ryan et al., 1996); that people possess a psychological immune system that speeds their recovery from negative emotional events (e.g., Festinger, 1957; Freud, 1937; Gilbert et al., 1998; Taylor, 1991; Vaillant, 2000); and that people who experience an intense negative affect are more likely to experience an intense positive affect as well, thereby 'canceling out' prolonged emotional reactions of one valence (Diener et al., 1991).

Each of these viewpoints can explain a part of the puzzle of emotional evanescence, but do not provide complete explanations. Even if happiness is partly dispositional, for example, it does not explain why external events make people happy or unhappy, and why people return quickly to their baseline level of happiness. Adaptation-level theories explain why an event loses some of its emotional power when experienced repeatedly (because it establishes a new comparison level), but not why affective reactions to a single event wear off quickly. The fact that goal pursuit is often as pleasurable as goal attainment does not explain why people recover rapidly from negative events that impede their goals. Finally, the existence of a psychological immune system explains why people recover quickly from negative events (i.e., because people rationalize or reconstrue the events in ways that make them less painful), but not why people recover quickly from positive events (cf. Taylor, 1991). None of these approaches offers a complete explanation of emotional evanescence.

1.2. Making Sense

The main reason for emotional evanescence, we suggest, is because people reduce the emotional power of events by making sense of them, a process we call 'ordinization.' When a novel event occurs, people automatically engage in cognitive work to make the event seem predictable and explainable. Although this process has been widely discussed in the psychology and economics literatures, its implications for people's emotional lives has been largely overlooked. By turning the extraordinary into the ordinary, people rob events of their emotional power.

We suggest that this ordinization process occurs for two reasons. First, it may be to people's advantage to recover quickly from emotional events, and the cognitive mechanism of making sense is an important way in which this is

accomplished. Second, the need to make sense of novel events may have other benefits, and emotional evanescence is a byproduct of this useful tendency to turn novel events into ones that seem predictable.

2. THE ADVANTAGES OF AFFECTIVE STABILITY

It may be to the organism's advantage to recover quickly from emotional events, and that human sense making abilities is one way in which this is accomplished. Such an argument is straightforward when applied to negative emotions. It is easy to imagine why it is advantageous to recover quickly from negative events, and why humans have mechanisms (i.e., the psychological immune system) that orchestrate this recovery. It is not as obvious why it is to people's advantage to 'recover' quickly from positive events, because this would seem to violate the fundamental principle that people seek to obtain pleasure and avoid pain. We believe, however, that a case can be made that it is important that people's emotional reactions not last too long, to both positive and negative events.

2.1. Why Happiness is Like Food

Happiness may be like food, in that we can have too little or too much of it. Food is a powerful operant, of course, and without it we would die. As noted by Woods (1991), there is an 'eating paradox' whereby people are motivated to ingest food, but doing so disrupts a number of important homeostatic, physiological systems (e.g., the level of blood sugar) and the human body has a number of mechanisms designed to minimize its impact (e.g., the secretion of insulin to lower blood sugar). In Woods's (1991, p. 500) words, 'Food intake has many attributes of a particularly disruptive event. Just as people learn to tolerate the administration of dangerous drugs, so they learn to tolerate the intake of food.' In support of the idea that food can be too much of a good thing, the risk of a heart attack increases ten fold in the hour after a heavy meal ('Heavy meal increases risk,' 2000).

Perhaps human happiness is a homeostatic system as well, whereby disruptions in a downward or upward direction trigger mechanisms to restore happiness to a set level. As we have seen, it is difficult to function with too little happiness (i.e., if one is severely depressed), and there are mechanisms in place to ameliorate the emotional impact of negative events. Similarly, there may be mechanisms in place to ameliorate the impact of positive events.

2.2. Why Happiness is Like Blood Pressure

Before detailing what these mechanisms are, it is worth noting that there may be a better analogy than happiness-as-food. Happiness, we suggest, may be more like blood pressure, which is an allostatic instead of a homeostatic system. In homeostatic systems, there is an optimal set point, and deviations from this point trigger negative feedback processes that attempt to restore it. The normal level of

blood sugar in humans, for example, is about 80 mg/ml. Deviations in either direction trigger physiological mechanisms that return it to this optimal level. When people ingest food and blood sugar increases, their pancreas release insulin, which causes a greater uptake of glucose by the liver and the muscles.

Sterling and Eyer (1988) introduced the term *allostasis* to describe a different type of feedback system. Rather than trying to maintain a set point, the purpose of allostatic systems is to keep a variable within a healthy range, but at the same time to let it vary in response to environmental demands. For example, there is no single set point for blood pressure that the body tries to maintain at all times; instead, pressure rises when physical activity is high, such as when a person exercises, and drops when a person rests. Obviously, however, there need to be mechanisms that keep blood pressure within a healthy range. If it rises or falls too much the person would die, and neither chronic hypertension nor hypotension are desirable states. Allostasis refers to systems designed to accomplish these two goals: to allow responsiveness to environmental changes, but to keep these changes within healthy limits. Sterling and Eyer (1988) detail a number of physiological mechanisms designed to do just this with the regulation of blood pressure.

We suggest that the regulation of human happiness is also an allostatic system. Just as there are mechanisms that keep blood pressure from dropping too low or rising too high, there are mechanisms to keep people from being too dysphoric or euphoric for too long a time, for three reasons. First, changes in emotion serve to signal the onset of critical events in the environment (Frijda, 1988; Ortony et al., 1988), and if the emotional system is to retain its signaling capacity, it must not get 'stuck' in an extreme emotional state. People who remain euphoric or depressed by what happened yesterday are less likely to be tuned in to emotional changes in their environment today. Second, intense emotional reactions can impede higher order cognitive processing, because it is difficult to think clearly when in a state of extreme dysphoria or euphoria—as anyone knows who has tried to review a journal article while severely depressed or wildly in love. Although moderately positive states seem to enhance creative problem solving (Fredrickson, 1998; Isen, 1993), extreme states make it difficult to engage in rational decision making. Third, it would be physiologically taxing to be in a constant state of dysphoria or euphoria. Euphoria is accompanied by increases in arousal, for example, that the body cannot maintain indefinitely. For all three reasons, then, people seem designed to have hedonic reactions to the objects and events in their environment, and then return quickly to the baseline.

2.3. Mechanisms of Affective Allostasis

We believe that there are a number of mechanisms that accomplish this goal, ranging from basic physiological processes to conscious, deliberative, choices on the part of the individual.

The opponent process theory. One mechanism of affective allostasis occurs at the physiological level. According to Solomon's (1980) opponent process theory,

physical events that cause extreme affective responses trigger an opponent process that produces the opposite affective response, to avoid prolonged, extreme reactions. When people ingest cocaine, for example, physiological processes occur that cause an extreme positive affective reaction. An opponent process is also triggered that neutralizes this reaction. According to Solomon, the opponent process is initially weak but is strengthened with repeated exposure, which explains habituation to an event or substance. When people first ingest cocaine the opponent process is weak, such that they experience a prolonged positive affective response. The more they take the drug the stronger the opponent process, however, which serves to diminish the positive response. Furthermore, because the opponent process takes a long time to extinguish when the event no longer occurs, the theory can explain withdrawal symptoms. When a cocaine addict stops ingesting the drug the pleasure-inducing response no longer occurs, but the opponent, pleasure-reducing response does, producing considerable dysphoria.

The opponent process theory has become a popular account of responses to physical stimuli such as drugs (e.g., Koob et al., 1997), and appears to offer a good explanation of how the body regulates extreme physical perturbations to the affective system, in both a positive and negative direction. The theory has been less successful in explaining people's reactions to psychological events (Sandvik et al., 1985). That is, the opponent process theory may explain what happens at a physiological level when the bodily systems are disrupted, such as neurochemical responses to drug ingestion, but it does not deal as well with the psychological responses to complex emotional events such as winning a lottery, falling in love, or losing a loved one. In order to explain why the emotions that such complex events trigger are often short-lived, we need to examine the kinds of psychological and behavioral responses people have to them.

Conscious, deliberative regulation of emotion. Sometimes people keep their emotions in check in a quite deliberative fashion. This is obvious when it comes to negative emotions; people do not like to feel bad and often take steps to improve their moods, such as visiting a friend or renting a funny movie. It is less obvious with positive emotions—why would people deliberately rain on their own parades? Although such cases may be rare, they do occur. Laughing uproariously at a funeral is unlikely to engender good will, and people might take steps to lower their moods before entering the funeral parlor (e.g., by thinking sad thoughts; Hochschild, 1979). Similarly, if people know they have to concentrate on a task, they purposefully avoid putting themselves in too good a mood (Erber, 1996).

Neither physiological processes nor deliberative behavioral strategies, however, can account fully for people's resilience in the face of positive and negative life events. We believe a mechanism has been overlooked, namely a set of automatic, nonconscious processes by which people make sense of and ordimize their environments. By turning novel events into predictable, ordinary ones, people rob those events of their emotional power and return quickly to their emotional baselines.

One view of this ordination process is that it developed in order to maintain affective stability. Another is that it is a quite functional process in its own right, because it increases people's sense of control over their environments. It is worth reviewing the idea that people seek to reduce ambiguity in their environments, because it is prevalent in psychology and economics. The consequences of this process on people's emotional lives, however, has been largely overlooked.

3. THE UNCERTAINTY AVERSION PRINCIPLE

As succinctly stated by Gilovich (1991, p. 9), 'We are predisposed to see order, pattern, and meaning in the world, and we find randomness, chaos, and meaninglessness unsatisfying. Human nature abhors a lack of predictability and the absence of meaning.' This *uncertainty aversion principle* is fundamental to many psychological theories. Attribution theorists argue that people have a fundamental need to view the world as predictable and controllable, and that the pervasive attempt to explain the causes of other people's behavior occurs in the service of this need (Gilbert, 1991; Heider, 1958; Jones and Davis, 1965; Kelley, 1967). In Heider's words, people make causal attributions 'not only because of intellectual curiosity, but also because such attribution allows him to understand his world, to predict and control events involving himself and others' (Heider, 1958, p. 146). Research on perceived control and the learned helplessness theory has demonstrated that if people feel that they cannot control or predict their environments, they are at risk for severe motivational and cognitive deficits, such as depression (Abramson et al., 1978; Langer and Rodin, 1976; Schulz, 1976; Seligman, 1975; Taylor and Brown, 1988; Thompson et al., 1998).

In fact, it could be argued that the attempt to understand and predict the world is the overriding purpose of the cognitive system (Pittman, 1998). Piaget pointed out that the process of assimilation and accommodation is fundamental to cognitive development (Piaget, 1952; Piaget and Inhelder, 1969). Children and adults assimilate new events to existing knowledge structures, or, if that is not possible, alter their knowledge structures to accommodate the new information. The idea of *people as sense makers* is pervasive in philosophy, the social sciences, and the humanities as well. Dennett (1991, p. 177, his emphasis) argued that 'all brains, are, in essence, *anticipation machines*' that try to predict what is going to happen next. And one of the chief functions of art and religion is to help people make sense out of a confusing, unpredictable world (e.g., Jobs, 1974; Pfeiffer, 1982).

Loewenstein (1994) reviewed a wide body of evidence that people are sense-seeking organisms who have a low tolerance for uncertainty. The need for certainty, he argues, is a major underpinning of curiosity. One reason people voluntarily seek to make themselves curious, he argues, is because it is so pleasurable to resolve it. Just as people sometimes fast to maximize the pleasure of a well-prepared meal, so will people seek uncertainty in order to obtain the pleasure of reducing it. Unsatisfied curiosity, like hunger, is a particularly aversive state.

Sometimes curiosity even gets the best of hunger. A few years ago, a homeless man in New York was rummaging through a trash dumpster, looking for unspoiled food, when he came across a bundle of letters and poems a man had written to his lover. Hungry as he was, the homeless man became fascinated with the letters and sat down and read them all. What happened to such a promising relationship, he wondered? How could two people who were so in love have gotten to the point where one of them threw the love letters in the trash, along with the onion peels and coffee grinds?

The homeless man called the author of the letters (after finding a phone number in one of the letters), and asked him how his beautiful prose and poetry could have ended up in a dumpster. It turned out that a relationship with a woman in his office had just ended, and the woman had thrown the letters away. 'I would have called you sooner,' the homeless man said, 'but this was the first quarter I was given today' (DeMarco, 1994; quoted in Aronson et al., 1999, p. 105). The man's desire to satisfy his curiosity was so strong that he was willing to go hungry a little longer.

3.1. Uncertainty Reduction in Economics

The idea that people abhor uncertainty is also prevalent in economics, usually under the rubric of aversion to ambiguity. Within the area of judgment under uncertainty, a number of investigators have noted examples of people's aversion to uncertain or ambiguous situations, including the *certainty effect* (Kahneman and Tversky, 1979), the *Allais paradox* (Allais, 1953), and the *Ellsberg paradox* (Ellsberg, 1961), which all have in common a descriptive account of the ways in which people avoid uncertainty and ambiguity at the expense of normatively preferable outcomes (Baron, 1994).

Ellsberg found that people violated the assumptions of the expected utility theory by preferring to avoid situations in which the probability of possible outcomes is unknown, and called the effect *ambiguity aversion*. For example, in one variation of the Ellsberg paradigm employed by Keren and Gerritsen (1999), people were asked to imagine an urn containing ninety marbles, thirty of which were red and the remainder of which were an unknown number of blue or green marbles. They were told that they would win a monetary prize if they correctly guessed the color of one marble drawn at random. Participants should be indifferent to the color of the marble they select, as the expected prior probability of winning is one-third for each color. In fact, most people preferred the red marbles, because of the uncertainty as to the number of blue or green marbles.

In follow-up studies, Keren and Gerritsen (1999, p. 170) further demonstrated that people preferred a non-ambiguous option, even when it was inferior in terms of expected utility. In one study they manipulated the amount of information associated with ambiguity. An interesting finding was that the inclusion of useless information about an ambiguous alternative (simply describing how the hypothetical machine that selects the ball from the urn at random, mechanically

operates) improved its attractiveness to subjects. The authors conclude that, 'Uncertainty, in whatever form, is an undesirable situation that, although inherent in our daily life, is one that we try to reduce or minimize.'

Others have noted that people find information value in certainty, and weigh this in their decision making (Frisch and Baron, 1988; Fox and Tversky, 1995; Heath and Tversky, 1991). When useful additional information is available, of course, it is rational to pursue it. However, additional information is not always available; and when available it is not always useful. As demonstrated by Bastardi and Shafir (1998), people will sometimes pursue information that clearly has no value for their decisions. There is a pervasive motivation for people to avoid uncertainty in their lives, although, as we will suggest, doing so may lead to paradoxical effects on people's happiness.

Economists have focused primarily on the ways in which people attempt to reduce uncertainty *prior* to making a decision, in the attempt to maximize utility. In contrast, psychologists have focused a good deal of attention on the ways in which people reduce uncertainty *after* an outcome or decision, as a way of promoting the view that the world is a predictable and controllable place. It is this latter, post-outcome uncertainty reduction with which we are primarily concerned, specifically with the ways in which it dampens people's emotional reactions to the event.

3.2. The Pleasure Principle

It is instructive to consider how the uncertainty aversion principle relates to what is probably the most fundamental motive of all, the pleasure principle. This motive is fundamental to virtually all psychological theories, including such diverse approaches as psychoanalysis and behaviorism. 'Our entire psychical activity is bent upon *procuring pleasure* and *avoiding pain*,' Freud (1924/1968, p. 365, emphasis in the original) argued, and termed this the pleasure principle. Learning theories, from Thorndike (1911) to Skinner (1938) and beyond, similarly assume that humans (and indeed, all animals) are motivated to seek out and maintain pleasurable states and to avoid negative ones. This assumption may be the only thing that psychoanalysis and behaviorism have in common, and there are, of course, many debates over the generality of the pleasure principle and exactly how it operates in humans. But no psychologist would deny that it is a fundamental human motive.

The status of the pleasure principle in economics has been more checkered. A central tenet in economics is the notion that individuals seek to maximize utility. Although its definition can be a source of some disagreement, utility to some is synonymous with satisfaction. The construct has been traced to Bernoulli (1738/1954), who observed that people act as if the pleasure or utility of a gain of a certain amount is less than the potential pain or disutility of a loss of the same amount. Its relationship to the pleasure principle was furthered by Bentham (1789/1948), for whom social and economic behavior could be explained in terms

of a *principle of utility*, defined in terms of the ability of objects to produce pain or pleasure.

For some early economists, namely Jevons, Walras, and Marshall, the notion was entertained that the pleasure derived from economic pursuit was both real and measurable. As with the degree in temperature and the pound in weight, satisfaction utility was given its own unit of measurement, the util (Sher and Pinola, 1981). Similarly, Adam Smith (1776/1976, p. 18) noted that the pursuit of self-interest is a fundamental economic motive. In his words, 'It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest'. The idea was not that people act selfishly and without altruism, but rather that in the pursuit of those ends that provide self-satisfaction, individuals thereby produce goods and services of value to others, providing mutual gain from their exchanges.

With the development of the expected utility theory, many modern economic approaches no longer equate utility with the simple desire for pleasure, partly out of concern about how to measure pleasure. As noted by Mellers (2000), however, the idea that people base decisions on anticipated pleasures and pain, and the importance of measuring and modeling these anticipated emotions, is gaining favor in the economic theories of judgment and decision making.

3.3. Two Motives or One?

If we assume that uncertainty is always aversive to people, then the uncertainty aversion principle is really just another form of the pleasure principle. Uncertainty may simply be one of the many forms of displeasure that people seek to avoid. Consistent with this view, several theories assume that there are severe affective consequences to a failure to achieve uncertainty reduction. Kagan (1972), for example, argued that by reducing uncertainty, people avoid a negative affect:

Most of the popular motives normally ascribed to children and adults by novelists or psychologists in Western culture, such as achievement, affiliation, power, dependency, nurturance, or succorance, can be derivatives of a primary motive to resolve uncertainty and alleviate subsequent affective distress. The affective distress, be it anxiety, fear, shame, or guilt, only emerges when the person cannot assimilate, remove, or act upon—in short, cope with—the original source of uncertainty. (Kagan, 1972, p. 56)

We suspect that the uncertainty aversion principle does, in fact, have its roots in the pleasure principle. Why would humans have such a strong aversion to uncertainty? At some level, the reason may well be to promote pleasure, in the sense of avoiding danger and furthering one's survival, by working to understand and predict one's environment. It makes more sense, for example, to argue that people reduce uncertainty in order to obtain pleasure and avoid pain, than to argue the reverse, that people seek pleasure in order to reduce uncertainty.

This is different than saying, however, that uncertainty aversion and the pleasure principle always go hand in hand, and that every time people reduce uncertainty, they obtain immediate pleasure. Our argument is that whereas

uncertainty is often aversive and people gain pleasure by reducing it, there are important exceptions in which reducing uncertainty also reduces pleasure. As just seen, one way that the sense maker reduces uncertainty is by turning events that are novel into ones that are commonplace; in short, by psychologically ‘ordinizing’ events. By so doing, events lose some of their emotional power, because ordinary events do not produce as strong an emotional response as novel, unexpected ones (Berlyne, 1971; Frijda, 1988). This process has positive hedonic consequences when the event is negative, by reducing the extent to which the event causes pain. It has negative hedonic consequences when the event is positive, by reducing the extent to which the event causes pleasure. That is, there is a paradoxical effect of the human sense making process: people try to discover the meaning of the things that happen to them so that they can repeat their best experiences and avoid repeating their worst, but by so doing they rob these experiences of their future hedonic power.

3.4. Ordinization and Negative Events

Through the process of assimilation, accommodation, and ‘sense making,’ an event that is painful at first gradually becomes less so, by virtue of seeming less novel and unpredictable. In a short story by D. Eisenberg, for example, a woman named Francie has this reaction just after learning that her mother has died:

If you were to break, for example, your hip, there would be the pain, the proof, telling you all the time it was true: *that’s then and this is now*. But this thing—each second it had to be true all over again; she was getting hurled against each second. *Now*. And *now again*—*twack!* Maybe one of these seconds she’d smash right through and find herself in the clear place where her mother was alive, scowling, criticizing. (Eisenberg, 1994, p. 109).

We have all had this ‘twack’ experience after a negative life event. We can hardly think about anything else, and when we do, the event and the negative emotions it engenders suddenly slam back into consciousness.

Little by little, however, the sense maker does its work. The event becomes woven into our life story and no longer seems so surprising or novel. The ‘twacks’ diminish, and we find ourselves thinking about the event less and less. Although we might be sad when we do think of the death of loved ones and other negative events, the strength of these emotional reactions gradually diminish. In colloquial language we ‘come to terms’ with the event after we ‘let it sink in,’ which are other ways of saying that the sense maker has succeeded, through the process of assimilation and accommodation, in transforming a novel, unexpected event into a familiar, more understandable one.

3.5. Ordinization and Positive Events

We will have more to say later about how the sense maker accomplishes this task. For now, the important point is that the same process occurs when people experience positive events. Unfortunately, the sense maker does its work well

here as well, such that novel events that cause a good deal of pleasure soon come to seem ordinary and, consequently, not as pleasurable. What seems like an amazing and unpredictable event at first quickly seems like old news, as it becomes woven into our world view and our attention turns to new events.

Consider two recent political events, the impeachment of President Clinton in early 1999 and the results of the presidential election in the November of 2000. Both events were virtually unprecedented in American history and received a tremendous amount of media attention. At the time, many Americans viewed these events as momentous, fantastic, chapters in history whose effects would reverberate for years. And while they certainly were momentous events in many ways, it is interesting how quickly they faded from people's attention. A few months after the impeachment trials, Clinton's presidency seemed to go on as before, with hardly a reference to the fact that he was nearly voted out of office by the Senate. A few months after the 2000 presidential election, many people did not think about it nearly as much as they thought they would.

The fact that big news events quickly fade from memory is due in part to the way the media operates; it is always looking for the next big story, and by tomorrow, today's cataclysmic event is old news. Our point is that the sense maker operates in much the same way. What seems like big news today is quickly ordinized through the processes of assimilation and accommodation, such that it quickly seems like old news, with little emotional power.

To appreciate the implications of this process when positive life events occur, consider a college undergraduate who achieves a life-long dream, namely to attend the Stanford University Business School. When she reads the letter of acceptance she screams with joy, calls her parents, and tells all her friends. She experiences genuine euphoria, as evidenced by a marked increase in her heart-beat, blood pressure, and other indices of arousal. She cannot think of anything else, and in fact skips her afternoon classes, knowing that she would not be able to concentrate.

Sooner rather than later, her life returns to normal. She calms down, physiologically and emotionally. In the hours and days after her acceptance, she experiences several twacks of pleasure whenever she thinks about it. As the weeks pass, however, she thinks about it less and less, and when she does, the thoughts are not accompanied by the ping of pleasure. The knowledge that 'I will be a Stanford MBA student' recedes to the background of her identity. It is an important part of her life story, to be sure, but it becomes woven into her storyline in such a way that it seems normal and ordinary, not novel and exciting. When she matriculates and begins attending business school classes in the fall, the thought that 'I am a Stanford MBA student' barely causes a ripple in her emotional life.

3.6. The Sense Maker at Work

Some of the most direct evidence for the human sense making process comes from research on the hindsight bias, whereby an event that seems uncertain in

prospect often seems more inevitable in retrospect. A stock broker might be quite uncertain, for example, whether technology stocks will rise or fall in value in the next year. After a major correction in which stocks lose 20 percent of their value, the stock broker is likely to believe that he or she should have seen this coming and blame him or herself for not predicting it. Fischhoff (1975) termed this the hindsight bias or 'creeping determinism,' a phenomenon that has proved to be quite robust (Carli, 1999; Hawkins and Hastie, 1990; Roese and Olson, 1996).

One explanation of the hindsight bias is that as soon as an event occurs, people begin to explain and make sense of it. 'Upon receipt of outcome knowledge,' Fischhoff (1975, p. 297) argued, 'judges immediately assimilate it with what they already know about the event in question. In other words, the retrospective judge attempts to make sense, or a coherent whole, out of what he knows about the event.' Roese and Olson (1996, p. 201) argue that, 'People perceive the occurrence of an outcome and are compelled to make sense of it' (see also Wasserman et al., 1991).

In our terms, the hindsight bias is a major component of the human sense making system, whereby people strive to make sense of their environments. When outcomes occur people do their best to explain them and put them in context. One consequence of this is that the outcomes seem more predictable in retrospect than they did in prospect. Another consequence—one that has been overlooked in the literature on the hindsight bias—is that the event loses some of its emotional power. An event that is unexpected and novel has more emotional impact than one that is expected and ordinary, as in our earlier example of the undergraduate whose joy at being accepted to graduate school fades relatively quickly.

But exactly how does explaining an event and making it seem more predictable reduce its hedonic power? One way, as we have argued, is that an event that seems ordinary and predictable elicits a less intense emotional reaction than one that seems novel and unpredictable. Another way is by reducing the frequency and duration of thought about the event; ordinary events command less attention than extraordinary ones, and are easier to file away in memory. Consider, for example, the undergraduate who was accepted by the Stanford Business School. A week later, compared to the day she received the acceptance letter, she thinks about her acceptance less frequently and for shorter periods of time, and when she does think about it, her emotional reaction is less intense. Consequently, the event causes less pleasure than it did.¹

¹ The hypothesis that the more ordinary and familiar an event seems, the less its emotional power, may seem inconsistent with the mere exposure effect. A considerable amount of research shows that the more people are exposed to a physical stimulus, such as a word, picture, or song, the more they like it. As argued by Zajonc (1998), this is a fundamental, precognitive process that is common to animals and humans alike. In contrast, we refer to a cognitive process whereby an event is transformed psychologically from one that is surprising, novel, and attention-demanding to one that is commonplace, ordinary, and not attention-demanding. This ordinization process, we suggest, often overpowers any increase in the positive affect due to the mere exposure process.

3.7. The Sense Making Process Occurs Automatically

In the above quotes about the hindsight bias, researchers used words such as ‘immediately assimilate’ and ‘compelled’ to describe the process by which people come to view events as inevitable. The implication is that people automatically explain events in such a way that makes them seem more probable. There is some support for the idea that the hindsight bias is a result of nonconscious, automatic mental processes (e.g., Pohl and Hell, 1996). More generally, there is considerable evidence that the attribution process, whereby people strive to understanding and explaining each others’ behavior, requires little or no mental effort, is unintentional, and occurs outside of awareness (Gilbert, 1998; Gilbert et al., 1988).

An important property of the sense making apparatus, we argue, is that it operates automatically. When novel events occur, people do not have to stop and deliberate about them consciously to make sense of them. Instead, assimilation, accommodation, and explanation occur outside of conscious awareness, such that events seem more predictable and ordinary. The fact that sense making occurs automatically and nonconsciously has implications for people’s understanding of their own emotional lives, which we will discuss later.

To summarize, uncertainty reduction and the pleasure principle operate in tandem for negative events; by finding meaning in such occurrences and ordinizing them, people succeed both in reducing uncertainty and in reducing the negative affect. However, these motives are at cross purposes when people experience positive events. In such cases, we argue, the uncertainty principle usually trumps the pleasure principle. People reduce uncertainty by ordinizing positive events, and thereby reduce the amount of pleasure that they derive from them.

4. EMPIRICAL TESTS AND IMPLICATIONS

An implication of our argument is that recovery from emotional events can be sped up or slowed down, by facilitating or inhibiting the sense making apparatus. Although there is very little research directly testing this hypothesis, there are some relevant findings, and we have conducted some initial studies in our lab.

4.1. Facilitating Sense Making to Reduce the Duration of Negative Affect

If our arguments are correct, then when negative events occur, emotional recovery can be facilitated by speeding up the process whereby people ordinize the events. There is very little direct research on this hypothesis, and indeed, there are more questions than answers. Must we let the ordinization process take its natural course, or is there some way of speeding it up? Given that sense making processes are largely automatic and nonconscious, to what extent can they be influenced by a conscious, deliberate attempt to facilitate them?

Research by Pennebaker on 'opening up' suggests one strategy that can help, namely writing about one's thoughts and emotions over a period of days. In numerous studies, Pennebaker has asked people to spend about 15 min, on three consecutive days, writing about 'your very deepest thoughts and feelings about an extremely important emotional issue that has affected you and your life' (Pennebaker, 1997, p. 162). People often write about quite negative events, such as the death of loved ones or sexual or physical abuse. Not surprisingly, writing about events such as these is initially upsetting; people who do so report more distress than control participants who write about superficial topics (such as their plans for their day). As time goes by, however, people show remarkable benefits from the writing exercise. Compared to people in the control condition, those who write about emotional experiences report better moods, get better grades in college, miss fewer days of work, show improvements in immune system functioning, and are less likely to visit physicians (Pennebaker, 1990, 1997; Smyth, 1998).

The reason that writing has such beneficial effects is that it seems to help people make sense of a negative event by constructing a meaningful narrative that explains it. Pennebaker has analyzed the hundreds of pages of writing his participants provided, and found that the people who improved the most were those who began with rather incoherent, disorganized descriptions of their problem and ended with coherent, organized stories that explained the event and gave it meaning. Further, people who write about current traumas tend to benefit more than people who write about past ones, possibly because people have not had as much of a chance to explain and find meaning in current traumas.

One interpretation of these findings is that sometimes, the sense maker cannot make sense of a disturbing event, and its emotional effects, thus, linger. Some life events are random and unpredictable and difficult to reconcile. Perhaps, Pennebaker's writing exercise allows people to reexamine these events in a way that imposes some meaning on them. The events come to seem a little more understandable, and as a result lose their emotional power.

4.2. Inhibiting Sense Making to Increase the Duration of Positive Affect

As we have discussed, when people experience positive events, they automatically ordinize these events to the point where they no longer produce much pleasure. If so, then anything that makes an event difficult to assimilate or explain should slow down the ordinizing process, prolonging people's pleasurable reactions to positive events. Paradoxically, uncertainty may prolong pleasure, to the extent that it increases the frequency and duration of thought about a positive event, and the intensity of emotional reactions to that event.

But how might the nonconscious sense maker be stymied when positive events occur? One possibility is to engage in counterfactual reasoning, whereby people mentally undo the past by imagining alternative outcomes (e.g., 'If the admissions committee at Stanford Business School had paid more attention to my low GPA

from my first year of college, I would have never gotten in.') The relationship between counterfactual thinking and sense making is complex, because there are conditions under which it increases people's confidence that the actual outcome was inevitable, and conditions under which it decreases confidence. As noted by Roesse and Olson (1996), to the extent that counterfactual thinking focuses people's attention on the reasons why the actual outcome occurred, they will become more confident in the inevitability of that outcome. For example, thinking about how an admissions committee might have reached a different decision can direct attention to why the committee made the decision they did ('Sure I had a low GPA in my freshman year, but I got all As after that, and had great scores on the Graduate Management Admission Test'), thereby making the outcome seem more inevitable ('How could they have done anything else but accept me?'). In our terms, counterfactual reasoning can speed up the process by which a novel event is ordinized, to the extent that it stimulates thinking about why the actual event occurred.

Roesse and Olson (1996) also note that counterfactual thinking can decrease people's certainty that an outcome was inevitable, if the alternative scenarios people imagine reinforce the idea that the actual outcome was arbitrary or random, and that other outcomes might well have occurred. Sometimes, for example, people think about arbitrary decisions or events that lead to a desired outcome, but easily could not have occurred. 'If I stayed home instead of going to Bob's party a few years ago,' someone might think, 'I never would have met Sarah and fallen in love.' Note that this counterfactual thought does not focus people's attention on a causal explanation for the desired event; instead, it emphasizes how arbitrary the event was and how it easily might not have occurred. In our terms, it slows down or undoes the ordinizing process of the sense maker, which should prolong the pleasure people obtain from positive events.

Ironically, trying not to think about a positive event might prolong the pleasure it causes, by increasing the accessibility of thoughts about the event. Wegner (1994) and his colleagues have shown that trying to suppress a thought about something can increase the accessibility of thoughts about that topic, especially when people are under a mental load. Wegner et al., (1994) demonstrated that keeping a positive topic secret (e.g., a romantic relationship) can increase the accessibility of thoughts about that topic and increase the pleasure that people derive from it. In our terminology, attempts at thought suppression might thwart the process by which people ordinize events and no longer think about them very often. Instead, thought suppression initiates both the conscious attempt to avoid thinking about a topic and a nonconscious, automatic search for thoughts about that very topic, in order to alert the conscious system that further attempts at suppression are necessary. When people are under a mental load, however, the conscious suppression process breaks down whereas the non-conscious search continues, increasing the accessibility of the topic. This is not a good thing when people are trying to avoid thoughts about anxiety-provoking topics or negative events. If people want to prolong the pleasure they get from

positive events, however, then one successful strategy might be to try not to think about it.

Another way to inhibit the nonconscious sense maker is to make it difficult for people to explain why a positive event occurred. We (Wilson et al., 2001) have tested this hypothesis in a recent study in which we first created a positive affect, and then manipulated the ease of assimilating and explaining its causes.

We improved people's mood by providing them with a feedback indicating that several other college students had evaluated them very positively in an impression formation study. Ostensibly as part of a study on how people form impressions using modern communication technology, participants believed that they were communicating over the internet with five students at other universities. They saw photographs of these students, and we scanned a photo of the participant for the other students to see. In fact there was only one real participant; the responses of the other students' responses were preprogrammed.

Once connected to the messaging program, participants saw the photos and first names of the other students and then responded to questions prompted by the program, such as, 'Please tell the opposite-sex participants about some of your interests. What are your career goals? What do you do in your spare time?' After composing and sending the messages, people read what the other students had ostensibly written. Participants then rated their liking for each student, selected one opposite sex student as their choice of 'best potential friend,' and sent a message to the students that explained their choice.

The participant then learned that all three of the opposite sex students had selected him or her as their best potential friend, and read flattering messages from each student explaining the reasons for their choice. In the easy to assimilate condition, participants were informed as to which student had written which explanation. The photo and name of each of the other students accompanied the message that they had supposedly written. In the difficult to assimilate condition, people read the identical explanations, but were not told which student had written which explanation (supposedly to preserve confidentiality). Thus, people in both conditions learned that all three opposite sex students had chosen them as their best potential friend, and read flattering explanations as to why. The only difference was that in one condition people knew which student had written which paragraph, whereas in the other condition they did not.

We predicted that the immediate effects of receiving the feedback would be to improve people's mood in both conditions, because in both cases the feedback was very positive. This was in fact the case. As seen in Figure 11.1, people's reported mood right after receiving the feedback was extremely positive, with a mean of about 8.6 on a 9-point scale. There was no significant difference between the easy and difficult to assimilate conditions. Further, in a follow-up study, both conditions were significantly higher than a control condition that did not receive any feedback from the other students.

We predicted that there would be a difference in how quickly this positive affect dissipated. In the easy to assimilate condition, people could explain the

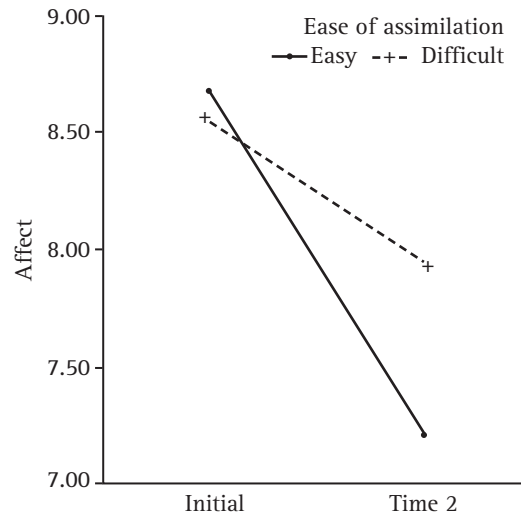


Figure 11.1. The change in affect over time, as a function of how easily participants could assimilate the information about why people preferred them as their best potential friend

feedback relatively quickly, by matching each paragraph with the person who ostensibly provided it. That is, regardless of which of the three students ostensibly wrote each paragraph (which was, in fact, counterbalanced), people's sense making apparatus could find an explanation (e.g., 'That makes sense that Sam would talk about our similar values; now that I think about it, he did seem to share many of my life goals.') Consequently, the feedback should become 'ordinized' (i.e., explainable, predictable). People in the difficult to assimilate condition, however, should find it more difficult to ordinize the feedback, because they could not match the explanations with their authors. Consequently, they might think about the feedback more and derive pleasure from it longer.

To test this hypothesis we assessed people's affect 15 min later, after they completed an unrelated filler task. As predicted, the positive affect had dissipated significantly more in the difficult to assimilate condition than in the easy to assimilate condition (see Figure 11.1). To test the hypothesis that people in the difficult to assimilate condition were less likely to ordinize the feedback and store it in memory, we also gave participants a word completion task at the end of the study, in which they had to make words out of stems such as 'ROM__.' People in the difficult to assimilate condition were more likely to complete this stem with the word 'romance,' suggesting that thoughts about the positive feedback from the opposite sex students were more accessible in this condition.

This result is preliminary, and clearly more work is needed to provide a clearer understanding of the way in which the human sense making apparatus can be

facilitated or inhibited. Nevertheless, the study is consistent with the possibility that there can be positive hedonic consequences to uncertainty. By making a positive event more difficult to explain and assimilate, the event may have remained more accessible in people's minds and caused a more lasting positive affect. While it is unlikely that any manipulation will cause people to remain happy indefinitely, perhaps there are times when some degree of uncertainty about the causes and meaning of positive events is a good thing, extending people's experience of the pleasure they bring. If so, there may be some situations in which the uncertainty aversion and pleasure principles operate at cross purposes.

5. SUMMARY AND IMPLICATIONS FOR ECONOMICS

As noted earlier, a key attribute of the sense maker is that it occurs largely outside of conscious awareness. Consequently, when people predict their future reactions to emotional events, they fail to take into account the degree to which they will transform the events from extraordinary to ordinary ones. This fact is one of the major reasons for the durability bias, the tendency for people to overestimate the duration of their reactions to emotional events. People assume that the events will retain their emotional power for longer than they in fact do.

This process was demonstrated by Gilbert et al. (1998), in a series of studies on affective forecasts about negative events, such as receiving unflattering feedback on a personality test. People failed to take into account the extent to which their psychological immune systems would ameliorate their reactions to the event, and thus predicted that their negative reactions would last longer than they in fact did. In this chapter, we discussed this process in a larger context, namely one in which the nonconscious sense maker ordinizes both negative and positive events. There may well be an extra motivation to minimize negative events, given the pain they cause (Taylor, 1991). Nonetheless, one of our central points is that the sense maker ordinizes positive events as well, thereby reducing their emotional power.

The implications of these ideas to economic decision making remain to be explored, but we can offer a few speculations here. Many consumer decisions are based at least in part on people's predictions about the affect these decisions will cause (Mellers, 2000). People buy television sets, automobiles, and clothing in part because they believe that these goods will bring them lasting pleasure. Consumers would be unlikely to spend \$1000 on a new high definition television set, for example, if they believed that it would increase their happiness for only a few days. At least implicitly, the amounts that people are willing to pay for a product are based on forecasts about the duration of the pleasure they will obtain from it (Della Vigna, 2000).

If so, research on the durability bias suggests that people often pay too much, by overestimating the amount of time that this pleasure will last. For the reasons we have outlined in this chapter, the positive affect people obtain from new

sweaters, televisions, and cars is likely to wear off quickly. If they were aware of this fact, they might not be willing to pay as much as they do, such as \$1000 for a new television set.

This raises the question of why people do not learn from experience that their affective reactions to durable goods do not last as long as they expect. There are a number of reasons why they might not (see Gilbert et al., 1998, and Wilson et al., in press, for a more complete discussion of this issue). People might remember that the pleasure they received from a new television set wore off quickly, but attribute this to the particular product ('High definition TV is not all that it was cracked up to be'), rather than to the workings of their nonconscious sense making processes. That is, they might fail to generalize from several such experiences, realizing that it is something inside their heads that is reducing their pleasure, rather than something about the specific products they buy.

Further, as time passes after a consumer choice, people might fail to remember that the product did not make them as happy for as long as they anticipated. Meyers et al. (2000) and Mitchell et al. (1997) found evidence for a retrospective durability bias, whereby people overestimated the duration of their happiness after positive emotional events in the past. Meyers et al., for example, surveyed people interested in politics at three points in time: A few weeks before the 1996 United States presidential election, right after the election, and three months later. Democrats showed a strong durability bias before the election, predicting that they would be much happier following Bill Clinton's victory than they in fact were. They also showed a retrospective durability bias, whereby three months after the election, they recalled being happier following Bill Clinton's victory than they in fact had been.

The reason why people exaggerated the duration of their pleasure in both prospect and retrospect may be that there was a common mechanism involved, *focalism*, whereby people think too much about the event in question and fail to consider the consequences of other events that are likely to occur. When predicting how they will feel in the future after an emotional event, people fail to take into account that there will be many other things going on in their lives that will influence their thoughts and feelings (Schkade and Kahneman, 1998; Wilson et al., 2000). Similarly, when trying to reconstruct how happy they were in the past, people may focus too much on the event and not enough on other events that occurred at the time, thereby overestimating the emotional impact of the event.

Interestingly, in both the Mitchell et al. (1997) and Meyers et al. (2000) studies, the retrospective durability bias was not as strong as the prospective one. One possible explanation for this is that the nonconscious sense maker had transformed people's view of the event over time, such that it seemed more ordinary and commonplace in retrospect than prospect, leading people to recollect that it must not have influenced them for very long. Nonetheless, a retrospective durability bias was still found. An implication of this finding is that it may not be easy to teach people that they are overestimating the duration of the pleasure that they will receive from consumer purchases. Although this may be undesirable for

individual consumers, it may not be such a bad thing for the economy as a whole, given its dependence on consumer spending.

In sum, we argue that humans are built in such a way that limits the duration of their emotional experiences. One reason for this is that emotional stability may be adaptive, such that it is not to people's advantage to be dysphoric or euphoric for too long. Emotional evanescence may also be a byproduct of uncertainty aversion. The nonconscious sense maker automatically ordinizes events so as to make them seem more predictable, with the side effect of reducing the emotional power of the events.

We discussed some ways in which the sense maker might be sped up or slowed down, in order to speed recovery from negative events and prolong the pleasure derived from positive events. The extent to which it is possible to alter the course of such a fundamental process for any length of time, or even whether it is desirable to do so, remains to be seen.

REFERENCES

- Abramson, L.Y., Seligman, M.E.P. and Teasdale, J.D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology*, 87, 49–74.
- Allais, M. (1953). Le comportement de l'homme rationnel devant le risque: Critique des postulats et axiomes de l'école américaine. *Econometrica*, 21, 503–46.
- Aronson, E., Wilson, T.D., and Akert, R.M. (1999). *Social psychology* (3rd ed.). New York: Longman.
- Baron, J. (1994). *Thinking and deciding* (2nd ed.). New York: Cambridge University Press.
- Bastardi, A. and Shafir, E. (1998). On the pursuit and misuse of useless information. *Journal of Personality and Social Psychology*, 75, 19–32.
- Bentham, J. (1948). *An introduction to the principles of morals and legislation*. Oxford, UK: Blackwell. (Original work published 1789.)
- Berlyne, D.E. (1971). *Aesthetics and psychobiology*. New York: Appleton.
- Bernoulli, D. (1954). Specimen theoriae novae de mensura sortis [Exposition of a new theory of the measurement of risk]. *Econometrica*, 22, 23–36. (Original work published 1738.)
- Brickman, P. and Campbell, D.T. (1971). Hedonic relativism and planning the good society. In M.H. Appley (Ed.), *Adaptation-level theory* (pp. 287–305). New York: Academic Press.
- Coates, D., and Janoff-Bulman, R. (1978). Lottery winners and accident victims: Is happiness relative? *Journal of Personality and Social Psychology*, 36, 917–27.
- Carli, L.L. (1999). Cognitive reconstruction, hindsight, and reactions to victims and perpetrators. *Personality and Social Psychology Bulletin*, 25, 966–79.
- Costa, Jr., P.T. and McCrae, R.R. (1984). Personality is a lifelong determinant of well-being. In C. Malatesta and C. Izard (Eds.), *Affective processes in adult development and aging* (pp. 141–56). Beverly Hills, CA: Sage.
- Davidson, R.J. (1994). Asymmetric brain function, affective style, and psychopathology: The role of early experience and plasticity. *Development and Psychopathology*, 6, 741–58.

- Della Vigna, S. (2000). *Comments on "Why Happiness is Like Food, and Why People Don't Know It"*. Paper presented at the Centre for Economic Policy Research Conference on Psychology and Economics, Brussels, Belgium.
- Dennett, D.C. (1991). *Consciousness explained*. Boston: Little Brown.
- Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist*, *55*, 34–43.
- Colvin, R., Pavot, W.G., and Allman, A. (1991). The psychic costs of intense positive affect. *Journal of Personality and Social Psychology*, *61*, 492–503.
- Eisenberg, D. (1994). The girl who left her sock on the floor. *The New Yorker* (pp.108–124).
- Ellsberg, D. (1961). Risk, ambiguity, and the Savage axioms. *Quarterly Journal of Economics*, *75*, 643–69.
- Emmons, R.A. (1986). Personal strivings: An approach to personality and subjective well-being. *Journal of Personality and Social Psychology*, *51*, 1058–68.
- Erber, R. (1996). The self-regulation of moods. In L.L. Martin and A. Tesser (Eds.), *Striving and feeling: Interactions among goals, affect, and self-regulation* (pp. 251–75). Mahwah, NJ: Erlbaum.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Fischhoff, B. (1975). Hindsight foresight: The effect of outcome knowledge on judgment under uncertainty. *Journal of Experimental Psychology: Human Perception and Performance*, *1*, 288–99.
- Fox, C.R. and Tversky, A. (1995). Ambiguity aversion and comparative ignorance. *Quarterly Journal of Economics*, *110*(3), 585–603.
- Fredrickson, B.L. (1998). What good are positive emotions? *Review of General Psychology*, *2*, 300–19.
- Frederick, S. and Loewenstein, G. (1999). Hedonic adaptation. In D. Kahneman, E. Diener, and N. Schwarz (Eds.), *Well being: The foundations of hedonic psychology* (pp. 302–29). New York: Russell Sage Foundation.
- Freud, A. (1937). *The ego and the mechanisms of defense*. London: Hogarth Press.
- Freud, S. (1968). *A general introduction to psychoanalysis* (J. Riviere, Trans.). New York: Washington Square Press. (Original work published 1924.)
- Frijda, N.H. (1988). The laws of emotion. *American Psychologist*, *43*, 349–58.
- Frisch, D. and Baron, J. (1988). Ambiguity and rationality. *Journal of Behavioral Decision Making*, *1*, 149–57.
- Gilbert, D.T. (1991). How mental systems believe. *American Psychologist*, *46*, 107–19.
- (1998). Ordinary personology. In D. Gilbert, S. Fiske, and G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vol. 2, pp. 89–150). New York: Random House.
- Pelham, B.W., and Krull, D.S. (1988). On cognitive busyness: When person perceivers meet persons perceived. *Journal of Personality and Social Psychology*, *54*, 733–40.
- Pinel, E.C., Wilson, T.D., Blumberg, S.J., and Wheatley, T.P. (1998). Immune neglect: A source of durability bias in affective forecasting. *Journal of Personality and Social Psychology*, *75*, 617–38.
- Gilovich, T. (1991). *How we know what isn't so: The fallibility of human reason in everyday life*. New York: The Free Press.
- Heath, C. and Tversky, A. (1991). Preference and belief: Ambiguity and competence in choice under uncertainty. *Journal of Risk and Uncertainty*, *4*, 5–28.
- "Heavy meal increases risk of a heart attack." *Washington Post* (2000, Nov. 15), p. A11.

- Hochschild, A.R. (1979). Emotion work, feeling rules, and social structure. *American Journal of Sociology*, 85, 551-75.
- Hawkins, S.A. and Hastie, R. (1990). Hindsight: Biased judgments of past events after the events are known. *Psychological Bulletin*, 107, 311-27.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.
- Isen, A.M. (1993). Positive affect and decision making. In M. Lewis and J.M. Haviland (Eds.), *Handbook of emotions* (pp. 261-77). New York, NY: Guilford Press.
- Jobes, J. (1974). A revelatory function of art. *The British Journal of Aesthetics*, 14, 24-133.
- Jones, E.E. and Davis, K.E. (1965). From acts to dispositions: The attribution process in social psychology. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2, pp. 219-66). New York: Academic Press.
- Kahneman, D. and Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47, 263-91.
- Kagan, J. (1972). Motives and development. *Journal of Personality and Social Psychology*, 22, 51-66.
- Kaplan, H.R. (1978). *Lottery winners: How they won and how winning changed their lives*. New York: Harper and Row.
- Kelley, H.H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska symposium on motivation* (Vol. 15, pp. 192-238). Lincoln, NB: University of Nebraska Press.
- Keren, G. and Gerritsen, L E M (1999). On the robustness and possible accounts of ambiguity aversion. *Acta Psychologica*, 103, 149-72.
- Koob, G.F., Caine, S.B., Parsons, L., Markou, A., and Weiss, F. (1997). Opponent process model and psychostimulant addiction. *Pharmacology Biochemistry and Behavior*, 57, 513-21.
- Langer, E.J. and Rodin, J. (1976). The effects of choice and enhanced personal responsibility for the aged: A field experiment. *Journal of Personality and Social Psychology*, 34, 191-8.
- Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin*, 116, 75-98.
- Lund, D.A., Caserta, M.S., and Dimond, M.F. (1989). Impact of spousal bereavement on the subjective well-being of older adults. In D.A. Lund (Ed.), *Older bereaved spouses: Research with practical implications* (pp. 3-15). New York: Hemisphere.
- Lykken, D. and Tellegen, A. (1996). Happiness is a stochastic phenomenon. *Psychological Science*, 7, 186-9.
- Mellers, B.A. (2000). Choice and the relative pleasure of consequences. *Psychological Bulletin*, 126, 910-24.
- Meyers, J.M., Wilson, T.D., and Gilbert, D.T. (2000). *The accuracy of predicted and recollected happiness after emotional events*. Unpublished raw data.
- Mitchell, T.R., Thompson, L., Peterson, E., and Cronk, R. (1997). Temporal adjustments in the evaluation of events: The 'rosy view'. *Journal of Experimental Social Psychology*, 33, 421-48.
- Ortony, A., Clore, G.L., and Collins, A. (1988). *The cognitive structure of emotions*. New York: Cambridge University Press.
- Parducci, A. (1995). *Happiness, pleasure, and judgment: The contextual theory and its applications*. Mahwah, NJ: Erlbaum.

- Pennebaker, J.W. (1990). *Opening up: The healing power of expressing emotions*. New York: Guilford.
- (1997). Writing about emotional experiences as a therapeutic process. *Psychological Science*, 8, 162–6.
- Pfeiffer, J.E. (1982). *Explosion: An inquiry into the origins of art and religion*. New York: Harper & Row.
- Piaget, J. (1952). *The origins of intelligence in children*. New York: International Universities Press.
- Piaget, J. and Inhelder, B. (1969). *The psychology of the child*. New York: Basic Books.
- Pittman, T.S. (1998). Motivation. In D. Gilbert, S. Fiske, and G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vol. 1, pp. 549–90). New York: Random House.
- Pohl, R.F. and Hell, W. (1996). No reduction in hindsight bias after complete information and repeated testing. *Organizational Behavior and Human Decision Processes*, 67, 49–58.
- Roese, N.J. and Olson, J.M. (1996). Counterfactuals, causal attributions, and the hindsight bias: A conceptual integration. *Journal of Experimental Social Psychology*, 32, 197–227.
- Ryan, R.M., Sheldon, K.M., Kasser, T., and Deci, E.L. (1986). All goals are not created equal: An organismic perspective on the nature of goals and their regulation. In P.M. Gollwitzer and J.A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 7–26). New York: Guilford Press.
- Sandvik, E., Diener, E., and Larson, R.J. (1985). The opponent process theory and affective reactions. *Motivation and Emotion*, 9, 407–18.
- Schkade, D. and Kahneman, D. (1998). Does living in California make people happy? A focusing illusion in judgments of life satisfaction. *Psychological Science*, 9, 340–6.
- Schulz, R. (1976). Effects of control and predictability on the physical and psychological well-being of the institutionalized aged. *Journal of Personality and Social Psychology*, 33, 563–73.
- Seligman, M.E. P. (1975). *Helplessness: On depression, development, and death*. San Francisco: Freeman.
- Sher, W.T. and Pinola, R. (1981). *Microeconomic theory: A synthesis of classical theory and the modern approach*. New York: North Holland.
- Skinner, B.F. (1938). *Behavior of organisms*. New York: Appleton-Century-Crofts.
- Smith, A. (1976). *An inquiry into the nature and causes of the wealth of nations*. (E. Cannan, Ed.). Chicago: University of Chicago Press. (Original work published 1776.)
- Smyth, J.M. (1998). Written emotional expression: Effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology*, 66, 174–84.
- Solomon, R.L. (1980). The opponent-process theory of acquired motivation. *American Psychologist*, 35, 691–712.
- Sterling, P. and Eyer, J. (1988). Allostasis: A new paradigm to explain arousal pathology. In S. Fisher and J. Reason (Eds.), *Handbook of life stress, cognition and health* (pp. 629–48). Chichester, UK: John Wiley and Sons.
- Suh, E., Diener, E., and Fujita, F. (1996). Events and subjective well-being: Only recent events matter. *Journal of Personality and Social Psychology*, 70, 1091–102.
- Taylor, S.E. (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin*, 110, 67–85.
- and Brown, J.D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103, 193–210.

- Thompson, S.C., Armstrong, W., and Thomas, C. (1998). Illusions of control, underestimations, and accuracy: A control heuristic explanation. *Psychological Bulletin*, *123*, 143–61.
- Thorndike, E.L. (1911). *Animal intelligence*. New York: Macmillan.
- Vaillant, G. (2000). Adaptive mental mechanisms: Their role in positive psychology. *American Psychologist*, *55*, 89–98.
- Wasserman, D., Lempert, R.O., and Hastie, R. (1991). Hindsight and causality. *Personality and Social Psychology Bulletin*, *17*, 30–5.
- Wegner, D.M. (1994). Ironic process of mental control. *Psychological Review*, *101*, 34–52.
- Lane, J.D., and Dimitri, S. (1994). The allure of secret relationships. *Journal of Personality and Social Psychology*, *66*, 287–300.
- Wilson, T.D., Centerbar, D., and Gilbert, D.T. (2001). *The pleasures of uncertainty*. Unpublished raw data, University of Virginia.
- Meyers, J., and Gilbert, D.T. (in press). Lessons from the past: Do people learn from experience that emotional reactions are short lived? *Personality and Social Psychology Bulletin*.
- Wheatley, T.P., Meyers, J.M., Gilbert, D.T., and Axsom, D. (2000). Focalism: A Source of durability bias in affective forecasting. *Journal of Personality and Social Psychology*, *78*, 821–36.
- Woods, S.C. (1991). The eating paradox: How we tolerate food. *Psychological Review*, *98*, 488–505.
- Wortman, C.B., Silver, R.C., and Kessler, R.C. (1993). The meaning of loss and adjustment to bereavement. In M.S. Stroebe, W. Stroebe, and R.O. Hansson (Eds.), *Handbook of bereavement: Theory, research, and intervention* (pp. 349–66). New York: Cambridge University Press.
- Zajonc, R.B. (1998). Emotions. In D. Gilbert, S. Fiske, and G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vol. 1, pp. 591–632). New York: Random House.

