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Timothy D. Wilson[1] and Daniel T. Gilbert[2]

[1]University of Virginia and [2]Harvard University

ABSTRACT—*We propose a model of affective adaptation, the processes whereby affective responses weaken after one or more exposures to emotional events. Drawing on previous research, our approach, represented by the acronym AREA, holds that people attend to self-relevant, unexplained events, react emotionally to these events, explain or reach an understanding of the events, and thereby adapt to the events (i.e., they attend less and have weaker emotional reactions to them). We report tests of new predictions about people's reactions to pleasurable events and discuss the implications of the model for how people cope with negative events, experience emotion in different cultures, and other topics.*

> *People often remark about how quickly the extraordinary becomes commonplace. I think that every time I'm on a motorway at night, or on a plane as it rises through cloud cover into sunlight. We are highly adaptive creatures. The predictable becomes, by definition, background, leaving the attention uncluttered, the better to deal with the random or unexpected.*
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> —McEwan, 1997, p. 141.

Sarah is thrilled when she learns that she won first prize in a fiction writing contest, but within a few days her pleasure fades. When she thinks about the award she is pleased, but not as much as when she first learned that she had won. Sam is despondent when Julie leaves him, but gradually his sadness eases. A year later, he rarely thinks about Julie, and when he does he feels a small twinge of sorrow but not the deep ache of despair. In examples such as these, people experience an intense affective reaction to an event, but their reaction fades over time. They have undergone *affective adaptation*, defined as the psychological processes that cause an affective response to weaken after one or more exposures to a stimulus (Frederick & Loewenstein, 1999). In this article, we review previous explanations of affective adaptation and propose a new theoretical approach. We suggest that people attend and have affective reactions to events that are self-relevant but poorly understood and that adaptation occurs when they "explain away" these events—when they transform them from extraordinary events that grab attention into ordinary events that do not. That is, when people understand self-relevant events, the "extraordinary becomes commonplace" and those events no longer elicit strong affective reactions.

The term *adaptation* has been used in many ways, thus we should be clear about the phenomenon we are trying to explain. In the literatures on learning and perception, adaptation refers to how responsive an organism is to stimulation in the environment. Sensory adaptation, for example, refers to physiological changes in response to external stimulation (e.g., the dilation and constriction of the pupil in response to varying intensities of light). Habituation refers to a decrease in responsiveness after repeated stimulation, whereas sensitization refers to an increase in responsiveness after repeated stimulation. Learning theories that explain these phenomena focus on low-level psychological and physiological processes that involve little, if any, higher order mental processing (e.g., Groves & Thompson, 1970).

Affective adaptation also involves the weakening of a response after one or more exposures to a stimulus, but the processes involved are likely to be more cognitive than they are for sensory adaptation. The affective stimuli to which people adapt are typically complex psychological events rather than objective properties of the environment (such as the intensity of light). Thus, affective adaptation likely involves higher order mental processes that alter the meaning of those events. In short, the phenomenon of affective adaptation is similar to other forms of adaptation, in that people's responses to an event become weaker over time. The explanation of affective adaptation, however, is likely to be quite different.

What are those explanations? Three principles have emerged from previous research. The *antagonism principle* holds that affective reactions wane because they trigger both automatic and conscious processes that antagonize them. For example,

Address correspondence to Timothy D. Wilson, Department of Psychology, 102 Gilmer Hall, P.O. Box 400400, University of Virginia, Charlottesville, VA, 22904-4400; e-mail: twilson@virginia.edu, or to Daniel T. Gilbert, Department of Psychology, William James Hall, Harvard University, Cambridge, MA 02138; e-mail: dtg@wjh.harvard.edu.

homeostatic and allostatic processes regulate the physiological arousal that accompanies intense emotions (Boyce & Ellis, 2005; Sterling & Eyer, 1988), and opponent processes counteract specific emotions (Solomon, 1980). Sarah may experience substantial physiological arousal when she learns that she won a coveted literary prize, and this arousal may trigger physiological processes that calm her down. Other antagonistic processes are under conscious control. After his breakup with Julie, Sam might decide to watch television or drink alcohol to antagonize his unwanted affective state (Eisenberg, Smith, Sadovsky, & Spinrad, 2004; Gross, 2001; Hull & Slone, 2004; Larsen & Prizmic, 2004; Ochsner & Gross, 2004; Taylor, 1991).

The *reference point principle* holds that events change the reference point to which subsequent events are compared. Adaptation level theories, for example, suggest that events create an adaptation level and that subsequent occurrences of these events trigger affective reactions only if they depart significantly from that level (e.g., Brickman & Campbell, 1971; Helson, 1964; Parducci, 1995). Similarly, a central tenet of prospect theory is that changes in states are the bearers of utility and that "our perceptual apparatus is attuned to the evaluation of changes or differences rather than to the evaluation of absolute magnitudes" (Kahneman & Tversky, 1979, p. 277). According to these approaches, each occurrence of an event is compared with previous occurrences and elicits affect only if it exceeds the standard set by those previous occurrences.

The *attention principle* holds that events have greater emotional impact when people are attending to them (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004; Kahneman & Thaler, in press; Pessoa, Kastner, & Ungerleider, 2002). Because people tend to focus on events "for a limited time after a marked change in circumstances" (Kahneman et al., 2004, p. 1779), the emotional impact of an event is dampened by subsequent events that draw attention away from it. The extent to which emotional events remain in focal attention, then, is a critical determinant of the speed of affective adaptation. Often, after an emotional event occurs, people engage in activities that produce competing emotions and distract them from the event. People who get back into the "swing of things" after the death of a loved one, for example, may adapt more quickly than people who do not, in part because they do not think as much about their loss.

Although these three principles distill the wisdom of decades of research on affective adaptation, no single theory integrates them, and no principle alone provides a full explanation of the phenomenon. For example, opponent process theory offers a good explanation of people's responses to physiological changes to stimuli such as drugs (Koob, Caine, Parsons, Markou, & Weiss, 1997), but it has been less successful in explaining people's responses to more complex psychological events (Sandvik, Diener, & Larson, 1985). Adaptation-level theories have been useful in explaining cases in which people explicitly compare a current experience with a past one, but they provide little guidance about how people will choose the particular reference point to which that event will be compared (Brown, 1953; Diener, Lucas, & Scallon, 2006; Eiser, 1990; Frederick & Loewenstein, 1999). In addition, norm theory (Kahneman & Miller, 1986) suggests that people do not always compare an experience with the past, and recent research has found that people often do not have the attentional capacity to compare their present experiences with alternatives and that they are more influenced by the nature of the experience itself than they anticipate (Morewedge, Gilbert, Myrseth, & Wilson, 2008). The attention principle captures a fundamental truth, namely that the affective system is responsive to what is currently in the spotlight of attention. However, no single theory explains what draws people's attention to an event in the first place and what causes people to shift their attention to other matters as time goes by.

THE AREA MODEL OF AFFECTIVE ADAPTATION

We offer a theory of affective adaptation that draws on some of the key features of the three principles just described and expands on others. Our approach is represented by the acronym AREA: attend, react, explain, and adapt. People attend to self-relevant unexplained events; react emotionally to these events; attempt to explain or understand these events; and, if they succeed, adapt to the events inasmuch as they attend less to them and have weaker affective reactions. Through these processes, which are summarized in Figure 1, professional awards and romantic breakups that are initially surprising and attention-grabbing come to seem perfectly understandable and thereby trigger less intense affective reactions than they did initially.

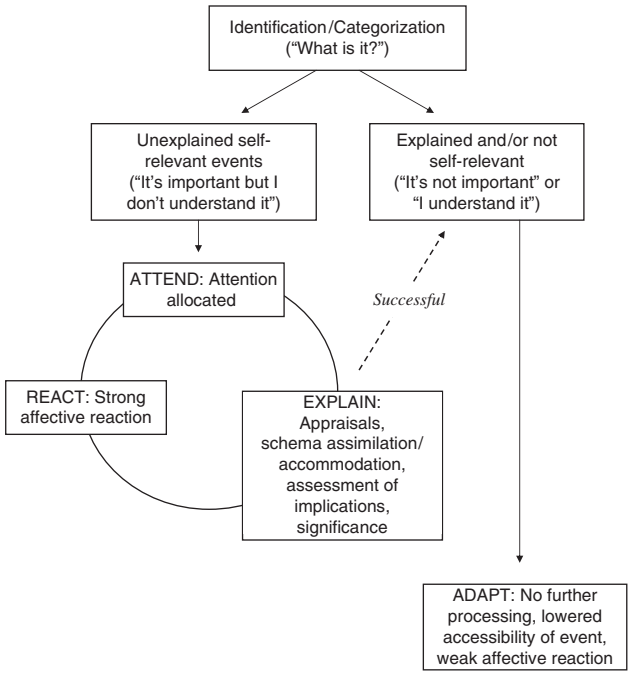

Fig. 1. The process of affective adaptation.

Attend

The attention principle suggests that events have greater emotional impact when people are attending to them. But to understand adaptation, we need to know what attracts people's attention to a particular event in the first place. Research has focused primarily on the roles of novelty, surprise, and the emotional relevance of stimulus information. Although each of these variables is influential, we suggest they are subservient to a more general principle, namely that information that is self-relevant, yet poorly understood, receives priority in attention and memory (Allport & Postman, 1946; Malle & Knobe, 1997). Variables such as novelty or surprise are influential because they typically signal that an event is poorly understood.

A novel event is typically defined as one that people have not encountered before or that is distinctive due to the context, whereas a surprising event is typically defined as one that is unexpected (Ortony, Clore, & Collins, 1988; Rescorla & Wagner, 1972). Both properties have been shown to attract attention, especially in highly impoverished perceptual environments in which people are presented only with a few letters, digits, or geometric figures (as in many experiments on attention). But in everyday life, people are constantly bombarded with a great deal of sensory information, and it would be maladaptive to orient to every novel piece of it without regard to the importance of that information (Ben-Shakhar, Asher, Poznansky-Levy, Asherowitz, & Lieblich, 1989; A.S. Bernstein, 1969; Gray, Ambady, Lowenthal, & Deldin, 2004; Johnston, Miller, & Burleson, 1986; Maltzman, 1979). Consequently, people screen out information that is irrelevant to their processing goals (Donchin, 1981; Kahneman, 1973; Scherer, 2001a). In one study, for example, people in a virtual-reality environment were more likely to detect and orient to a stop sign at an intersection than to one that was placed in the middle of a block (Shinoda, Hayhoe, & Shrivastava, 2001). Although the sign in the middle of the block was novel (people had probably never seen a stop sign in such a location) and surprising (people did not expect to see a stop sign there), it was not relevant to their goal of obeying traffic rules and avoiding collisions with vehicles in intersections. In this study, then, the self relevance of a stimulus trumped novelty and surprise as a determinant of attention.

But the relevance of information does not by itself explain what attracts attention. People analyze incoming information with two questions in mind: "Is it important to me?" and, "Do I understand it sufficiently?" If the event is deemed to be both self-relevant and unexplained, people allocate attention to it, and the event triggers an affective reaction. Conversely, if the event is deemed to be either unimportant or sufficiently explained, people do not allocate attention to it, and the event does not trigger an affective reaction.[1] This hypothesis, we should note, is consistent with recent theorizing about the role of the amygdala in information processing (M. Davis & Whalen, 2001; Duncan & Barrett, 2007; Whalen, 1998). Whalen (1998), for example, argued that "the amygdala modulates vigilance and subsequent information processing in ambiguous, biologically relevant learning situations" (p. 182).

Self-relevant, poorly understood events are also likely to be highly accessible in memory and lead to intrusive thoughts (Martin & Tesser, 1996; Wegner, 1994). For example, bereaved people who have failed to make sense of their loss think about the event more and recover less quickly than those who have not (Bonanno et al., 2002; C.G. Davis, Nolen-Hoeksema, & Larson, 1998; Janoff-Bulman, 1992; Pennebaker, 1997; Silver, Boon, & Stones, 1983). Similarly, people have recurrent thoughts about unresolved goals (see also Carver & Scheier, 1990; Martin & Tesser, 1996). Savitsky, Medvec, and Gilovich (1997), for example, showed that people are less likely to recall past actions that they regret than inactions they regret, because people are more likely to do cognitive work to make sense of the actions rather than the inactions. Once people have done something they regret, the episode is over and they can spend time thinking about it and coming to terms with it. An opportunity not taken is more of an open book. People cannot know what would have happened had they chosen to act, and because of this lack of resolution, they are more likely to recall regrettable inactions than regrettable actions.

Research on the Zeigarnik effect shows that people are more likely to remember uncompleted tasks than completed ones (Zeigarnik, 1935). But Seifert, Meyer, Davidson, Patalano, and Yaniv (1995) argue that both Zeigarnik's research and their own studies demonstrate that only uncompleted actions that are particularly meaningful to people have a memorial advantage. In one experiment, people who worked on problems until they either solved them or reached an impasse were more likely to remember the unsolved problems. But people who were interrupted by the experimenter before they reached a solution or an impasse were less likely to remember the unsolved problems (Seifert et al., 1995). Apparently, the perceived inability to solve a problem makes it memorable, not the mere fact that it is unsolved. In short, unexplained self-relevant events receive priority in attention and stand out in memory.

React

In addition to attracting attention, unexplained self-relevant events trigger strong affective reactions. Indeed, an important function of the emotional system is to signal people that something important is occurring in their environment that needs to be understood (Mandler, 1975, H.A. Simon, 1967). The idea that self-relevance amplifies affective reactions is incorporated in most appraisal theories of emotion. Frijda's (1988, 2007) law of concern, for example, states that, "*Emotions arise in response to events that are important to the individual's goals, motives, or concerns*" (1988, p. 351, emphasis in original). Scherer (2001a)

[1] Objects that are currently part of people's mental imagery also attract attention (Moores, Laiti, & Chelazzi, 2003; Pashler & Shiu, 1999). It may be that the attentional system is biased to detect self-relevant events that are either poorly understood or highly expected. It is the former events, however, that are likely to trigger intense affective reactions and are thus most relevant to a model of affective adaptation.

argued that only events that are perceived as self-relevant are selected for further processing and appraisal. Research has supported the idea that self-relevance intensifies affective responses. Baldwin, Carrell, and Lopez (1990) flashed subliminal images of the Pope or a stranger, both with disapproving expressions, to Roman Catholic participants. Practicing Catholics had more negative reactions when seeing the Pope than they did when seeing the stranger. The pictures had no effect on nonpracticing Catholics, which is consistent with the idea that stimuli high in self-relevance have a greater impact than stimuli low in self-relevance.

As noted by Clore and Gasper (2000), the self-relevance of goals is not an absolute but depends on the salience of competing goals. For example, sporting events can trigger intense emotions in ardent fans even though the outcome is not nearly as important to them as many other things, such as their physical well-being and their children. Yet, when fans watch games, their other goals recede to the background. Similarly, people absorbed in a novel or movie can experience intense emotions because, at that moment, they care about what happens to the main characters. By the same token, images of people in another part of the world suffering from violence will trigger attention and an emotional reaction, if people view the suffering as relevant to their goal of wanting to live in world free of violence and strife. Images of someone they know suffering from violence would likely trigger an even stronger emotional reaction, because the suffering of people they know would be higher in self-relevance than the suffering of strangers.

In addition to self-relevance, research shows that unexpectedness and novelty amplify affective reactions (Mellers, Schwartz, & Ritov, 1999; Ortony et al., 1988). Unexpected and novel events increase physiological arousal (e.g., Berlyne, 1960; Kahneman, 1973; Le Poire & Burgoon, 1996; Price & Geer, 1972), which in turn intensifies affective reactions (Schachter & Singer, 1962; Zillmann, 1978). Consistent with this view, reward pathways in the brain, such as dopaminergic neurons, are activated not by the valence of a stimulus but by its lack of predictability (Berns, McClure, Pagnoni, & Montague, 2001; Bevins, 2001; Schultz, Dayan, & Montague, 1997). And, it is not just human beings who respond to novelty. Bulls become bored by the artificial "mating" device that collects their sperm, and anything that makes the device novel rekindles the bulls' interest. One study found that even moving the device to a new location—as little as 3 feet away—decreased the bulls' time to ejaculation by 84% (Hale & Almquist, 1960).

As argued earlier, however, unexpected and novel events may attract attention and intensify affective responses because they are more difficult to explain than are expected or familiar events. In general, it takes longer to explain events that are unexpected or that have not been experienced before than ones that are expected or familiar. But, holding surprise and novelty constant, events can differ in terms of how easy they are to explain (e.g., to assimilate to our prior knowledge structures). Two people might be equally surprised by the fact that a tornado has destroyed their homes, but one might find it easier to explain the destruction (e.g., "It was God's will") and thus have a less intense affective reaction to it. In addition, unexpected and novel events vary in their importance, and trivial ones are unlikely to trigger affective reactions (e.g., a pattern of clouds never seen before). We suggest that the same variables that cause shifts in attention also intensify emotional experience, namely how self-relevant and well-explained an event is.

Explain (Understand) and Adapt

When people attend to self-relevant events that are poorly understood and have affective reactions to those events, they attempt to explain those events—not just in the sense of determining their causes, but also in the broader sense of understanding the consequences of the events for their goals and self-concept (Scherer, 2001a). If the process of explanation is successful—people know what the event is, why it occurred, how it fits into their self-concepts, and what it means more broadly—they have adapted to it. They do not think about the event very often, and when they do, they have a relatively weak affective response.

The "explain" part of our model is perhaps most open to misinterpretation, thus we should be clear about what it entails. As noted, we do not mean "explain" in the strict sense of causal attribution, but in the broader sense captured by one of the definitions in the Oxford English Dictionary (1989): "to assign a meaning to, state the meaning or import of; to interpret." We thus use "explain" synonymously with "understanding the nature, causes, and implications" of an event. The Oxford English Dictionary goes on to say that to explain is "*to explain away*: to modify or do away with (a meaning, etc.) by explanation; to explain so as to deprive of force or significance." The first part of the definition describes the fact that people make sense of events, and the second part describes the fact that making sense of events reduces their significance. Our definition of explain includes both of these points: People exert cognitive effort to determine the meaning and import of an event, and if they succeed in doing so, the event is deprived of "force or significance."

The idea that human beings are skilled explainers of their environment is certainly not new; it is a core feature of Piaget's theory of child development (Piaget, 1952; Piaget & Inhelder, 1969), attribution theories (Gilbert, 1998; Heider, 1958; Jones & Davis, 1965; Kelley, 1967), and appraisal theories of emotion (Scherer, Schorr, & Johnstone, 2001). The most novel part of our approach is that explanation leads to affective adaptation. Appraisal theories of emotion, for example, have been concerned primarily with the initial emotion people experience after appraising an event and have said little about the duration of those emotions (e.g., what causes them to fade over time; Frijda, Mesquita, Sonnemans, & Van Goozen, 1991; Scherer, 2001b).

We suggest that explanation has been overlooked as a key antagonistic process responsible for adaptation.

For example, consider a college student who learns that he failed a test. Upon hearing the news, he judges the self-relevance of this event and tries to understand it. The poor grade might be low in self-relevance because he already has an A in the class and can drop his lowest test grade. Or he may have a ready explanation for the event (he knows he has no aptitude for basket weaving and didn't study at all). If either of these conditions is met, the student will think little about the test and will have a relatively weak affective reaction to it. If the event is self-relevant (e.g., the student needs to pass the course to graduate) and is poorly understood (e.g., he studied hard and thought he had done well), then an iterative process of attention, reaction, and explanation is initiated, as shown in Figure 1. He appraises the meaning of the event, invokes schemas to understand it, and assesses its broader implications for his goals and self-concept. If this attempt to understand the event is successful, then the cycle is completed. The student no longer thinks about the event, and when he does, his affective reaction is relatively weak because the event is well understood. As this example illustrates, explanation induces affective adaptation by reducing the frequency with which people think about events and the intensity of the affect they experience when they do.

Research on the hindsight bias, for example, finds that historical upheavals, improbable outcomes of sporting events, and sudden relationship break ups all seem, in retrospect, like things that one should have anticipated (D.M. Bernstein, Atance, Loftus, & Meltzoff, 2004; Carli, 1999; Fischhoff, 1975; Hawkins & Hastie, 1990; Roese & Olson, 1996; Sanna & Schwarz, 2003; Wasserman, Lempert, & Hastie, 1991). As soon as an event occurs, people begin to explain it and, once explained, the event seems more predictable (Pezzo, 2003). Although the consequence of the hindsight bias for affective reactions to the events has received little attention, we suggest that events that come to seem predictable and explainable produce less intense affective reactions than do those that initially seemed unlikely. Similarly, an event that is yet to happen seems harder to explain than one that has already occurred, suggesting that thoughts about future events should evoke stronger affective reaction than thoughts about past events. Recent research has confirmed this prediction (Caruso, Gilbert, & Wilson, in press; Van Boven & Ashworth, 2007).

Explanatory Success and Failure

A key to understanding affective adaptation, then, is determining when attempts to explain emotional events succeed or fail. A number of variables have been identified that facilitate or impede explanation.

Novelty. As noted earlier, the more experience people have with an event, the more likely they are to understand it (Abelson & Lalljee, 1988). A person must do some explanatory work the first time she sees a beggar in front of her office ("Is this person really in trouble? What will he do with the money if I give it to him?"), but not the 20th time. People have weaker affective reactions to recurrences than occurrences because recurrences are already understood.

Surprise. Also as noted, the more unexpected an event is, the more difficulty people have explaining it. When people expect an event to happen, they often do some of the explanatory work in advance (Wilson, Wheatley, Kurtz, Dunn, & Gilbert, 2004). Studies of bereavement, for example, have found that people have more trouble adjusting to the sudden death of a loved one than to the death of a loved one from a terminal illness (Lehman, Wortman, & Williams, 1987; O'Bryant, 1991).

Variability. Events never recur in precisely the same way, and the more similar a recurrence is to the one before it, the less explanatory work a person will have to do—and thus the less intense his or her affective reaction will be. For example, durable goods change relatively slowly over time, and thus the experience of using a hammer today will be very much like it was last year. Other recurrences are more variable: Tonight's dinner at a local restaurant may be quite different from the dinner one had there last year. This is partly a semantic issue of how narrowly we define a category; "food," for example, will vary more over time than will "breadsticks." Nonetheless, some objects are by nature more dynamic, either because they are vehicles for novel experiences (e.g., television sets that allow people to see ever-changing programs) or because they change over time (e.g., other people). A person who has successfully explained an event in the past will need to do so again if the event's recurrence is significantly different from its original occurrence, and this will prolong the person's affective reaction. Consistent with this hypothesis, Van Boven and Gilovich (2003) found that positive experiences such as vacations and meals at restaurants, which are variable, made people happier than material purchases such as clothing or computer equipment, which are stable—even when the monetary value of the events and objects was held constant.

Certainty. The less certain people are about the nature of an event, the less likely they are to explain it. For example, people adapt more quickly to news that they definitely have a serious illness than to news that they might have a serious illness (Frederick & Loewenstein, 1999) because they do not try to explain events until they know precisely which event needs explaining. The AREA model suggests that the same is true of positive events. Uncertainty about positive events should decrease the likelihood that people will explain them, which should produce a greater duration of pleasurable feelings. We have found support for this prediction, as described later.

Explanatory coherence. A number of other factors make it difficult to construct a coherent explanation of an event (Abelson

& Lalljee, 1988; Krull & Anderson, 1997; Lien & Cheng, 2000; Read & Marcus-Newhall, 1993; Thagard, 1992, 2000). First, people find it more difficult to explain an event if they do not have a prior schema (or "explanatory prototype," see Abelson & Lalljee, 1988) that accounts for the event. Second, the greater the number of plausible explanations for an event, the more difficulty people in have settling on any one of them. Third, people prefer simple explanations to complex ones. Fourth, people prefer explanations with breadth that explain more of the evidence over narrow explanations that explain only a part of it (Read & Marcus-Newhall, 1993; Thagard, 2000). Events that are easy to explain in these ways should have a shorter emotional impact than events that are more difficult to explain.

Explanatory Content

All explanations are not equal. Attributing a bad grade to one's stupidity will produce a more negative affective reaction than will attributing the same bad grade to the difficulty of the test. Indeed, years of research on emotional appraisal have specified how different kinds of interpretations lead to different emotional experiences, such as joy, pride, anger, or remorse (e.g., Arnold, 1960; Lazarus & Folkman, 1984; Ortony et al., 1988; Roseman, 2001; Scherer, 2001b; Scherer et al., 2001; Weiner, 1985). Research on attribution theory, such as the revised learned helplessness model (Abramson, Seligman, & Teasdale, 1978), has demonstrated that the particular way in which people explain negative events (i.e., internal, stable, global attributions) produce negative affect of greater intensity and duration than do other ways of explaining negative events (i.e., external, unstable, specific attributions). Some explanations make us feel wonderful ("I got an A on the quiz because I'm really smart"), others less so ("I got an A on the quiz because it was really easy").

The content of an explanation can influence the course of adaptation in two ways, both predicted by the AREA model. First, an explanation can determine the perceived self-relevance of an event. Hannah might be initially pleased when she finds out she got an A on a quiz, but after learning that the quiz will have little impact on her final course grade, the whole episode seems unimportant and her reaction fades quickly. Second, when people do perceive an event to be self-relevant, their initial explanation can determine how much additional cognitive work is necessary to understand the larger implications of the event. Two students might both attribute an A on an algebra test to the fact that they are talented in math and feel joy and pride as a result. One, who has done very well in all of her previous math courses, already has a "good at math" schema and does not need to do further cognitive work to understand the implications of the grade. Thus, she adapts quickly. The other, who is experiencing success in math for the first time, has to do more cognitive work to alter her self-schemas and understand the implications of her success for her goals and self-concept. Consequently, she adapts more slowly. The same is true of negative events: Adaptation will take a long time if a major change in one's self-schemas is necessary to understand the event, which is likely when people attribute failure to low intelligence instead of bad luck.

A further implication of the AREA model is that any explanation facilitates adaptation more than no explanation. People who are uncertain whether they failed a test because of low intelligence or bad luck should take longer to adapt than people who are certain that it was one or the other cause, because uncertainty keeps the event accessible in memory. Adaptation will take longer for some explanations than for others, but people have difficulty adapting if they have no idea why an event occurred. This analysis leads to novel predictions about the effects of uncertainty on adaptation to positive events, which we will discuss later in this article.

Finally, it is important to note that explaining and understanding a stimulus might lead to a reconstrual of it, as in the case of acquired tastes. Novice wine tasters, for example, might not be able to distinguish a 1996 Chateau Pichon Lalande Pauillac from jug wine. After extensive training, the tasters perceive things they did not before, such as flavors of mulched leaves and pencil shavings, and develop a strong preference for the Pauillac. Similarly, someone reading a novel for the second time might notice themes and illusions that he or she missed before, thereby enjoying the novel more. These examples suggest that under some circumstances, the process of explanation feeds back to the process of identification/categorization, essentially restarting the process depicted in Figure 1.

HYPOTHESES AND EMPIRICAL SUPPORT

The AREA model makes predictions about the kinds of emotional events people will adapt to most quickly, helps organize the literature on coping with negative life events, makes novel predictions about the duration of reactions to positive events, and has implications for cultural differences in emotional experience.

Explanation Speeds Recovery From Negative Events

The more people understand negative experiences, the less they think about them and the less intense their affective reactions are when they do. As Christopher Reeve, who became a quadriplegic after a horse riding accident, noted "It's all part of the random chaos of life, the question is how you make sense of it afterward" (quoted in Adler, 1996, p. 52).

One source of evidence for this claim comes from the literature on how people cope with events that challenge their self-esteem, such as receiving negative feedback at work, doing poorly on a test, or being left by a lover. When such events happen, people initiate strategies to minimize the emotional effects of these events. These strategies include defense mechanisms (Freud, 1924/1968; Vaillant, 2000), dissonance

reduction (Aronson, 1968; Festinger, 1957), comparing oneself favorably to others (Suls & Wheeler, 2000), affirming oneself in another domain (Steele, 1988), attributing negative outcomes to external circumstances and positive outcomes to oneself (Mezulis, Abramson, Hyde, & Hankin, 2004), affirming one's world views to reduce concerns about mortality (Pyszczynski, Greenberg, & Solomon, 1999), and a host of other esteem-maintenance strategies (Dunning, 1999; Festinger, 1957; Folkman, 1984; Greenwald, 1980; Kunda, 1990; Taylor, 1989; Tesser, 2000).

These strategies are so pervasive that they can be thought of as a "psychological immune system" that detects and neutralizes challenges to people's sense of self-worth (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). For all their differences, the processes share the same goal, namely to reduce the negative affect caused by threats to one's self-esteem (Hart, Shaver, & Goldenberg, 2005; Tesser, 2000, 2001). Many of the processes can be thought as instances of explanation, inasmuch as people revise their beliefs about the nature and causes of the event in order to ameliorate its negative impact (Ochsner, Bunge, Gross, & Gabrieli, 2002). Thus, when dealing with threats to one's self-esteem, people often construct explanations that deflect blame from the self. When it is difficult to avoid self-blame, people can lower the perceived self-relevance of the event (e.g., after failing a test for which they studied for hours, they can conclude that the topic never really interested them anyway). One way of reducing dissonance, for example, is to trivialize an event and downplay its self-relevance (L. Simon, Greenberg, & Brehm, 1995). This finding is consistent with our hypothesis that it is self-relevant, poorly understood events that trigger attention and produce intense affective reactions. Affective reactions will dissipate to the extent that people succeed in understanding the event or decide that it is no longer self-relevant.

The literature on coping also supports the idea that explanation speeds recovery from negative events. The people who recover most quickly from traumas, such as the deaths of loved ones, are those who are able to find meaning in the event (Bonanno et al., 2002; C.G. Davis et al., 1998; Janoff-Bulman, 1992; Pennebaker, 1997; Silver et al., 1983). The particular kind of meaning is, of course, important. If people are able to generate explanations that maintain their view of the world as a just place (Lerner, 1980), they are less likely to experience intrusive thoughts about the event. But even a negative explanation of an event may be preferable to no explanation at all.

Evidence for this hypothesis comes from the medical literature on genetic testing (Baum, Friedman, & Zakowski, 1997). In one study, participants who had a parent with Huntington's disease took a genetic test to see if they had inherited the gene that causes this fatal, adult-onset illness (Wiggins et al., 1992). Participants learned either that there was a high likelihood that they had inherited the Huntington's gene, that there was a low likelihood that they had inherited the gene, or that the test was inconclusive. People who received the good news showed an initial increase in psychological well-being, but after 12 months they had returned to their baseline levels of well-being. People who received the bad news were initially upset, but after 12 months they too had returned to their baseline levels and were as happy as the people who had received the good news. The people who received inconclusive results and were thus in a continued state of uncertainty about their health were the most upset. After 12 months, they exhibited significantly lower well-being than did the people in the other two groups. One reason for this, we suspect, is that these people thought about the disease more often.

Studies by Kross, Ayduk, and Mischel (2005) illustrate some of the conditions under which people are able to explain a negative event and thus adapt to it. Participants recalled a personal interaction that had made them feel anger and hostility, adopted an "immersed" or "distanced" perspective on the interaction, and then wrote about how they felt or why they felt that way. People reported a substantial degree of negative affect, except in the condition in which they both adopted a distanced perspective and wrote about the reasons why they felt the way they did. People in this condition were the most likely to achieve an understanding of the experience; that is, they were most likely to "make sense of the past" and "understand the causes underlying the event" (Kross et al., 2005, p. 713). Further, the degree to which people achieved an understanding of the event significantly mediated the reduction in negative affect they experienced.

Helping people develop explanations is an integral part of many psychotherapeutic approaches, and some types of psychotherapy are explicitly designed to help people integrate their experiences into their knowledge structures. For example, cognitive processing therapy is designed to help people who have been sexually assaulted identify the ways in which their trauma conflicts with their prior knowledge structures and to help them develop new knowledge structures that provide healthier ways of understanding the trauma (Resick, Nishith, Weaver, Astin, & Feuer, 2002; Resick & Schnicke, 1992). More generally, research has found that different kinds of psychotherapy are equally effective in the treatment of psychological disorders such as depression (Ablon & Jones, 1999; Miller & Berman, 1983; Sloane, Staples, Cristol, Yorkston, & Whipple, 1975; Smith, Glass, & Miller, 1980; Stiles, Shapiro, & Elliott, 1986), and the key common ingredient may be helping people to achieve a coherent explanation of their problems. One study, for example, found that the extent to which depressed clients adopted a new belief system advocated by the therapists was the best predictor of successful outcomes, even though the therapists were using quite different therapeutic approaches (Ablon & Jones, 1999, 2002; see also Kelly, 1990; Sloane et al., 1975). The interactions between therapist and client are undeniably complex, and the success of therapy depends on many factors, including the precise symptoms and disorders being treated (Westen, Novotny, & Thompson-Brenner, 2004). But very different therapeutic approaches have beneficial effects, and the

common thread that unites these approaches may be the clients' development of a new, healthier narrative to explain his or her life and problems (Wilson, 2002).

Explanation Speeds Recovery From Positive Events

The more quickly people reach an understanding of negative events, the sooner they recover from them. Virtually all previous approaches predict that explanation will make people feel better, regardless of whether the event they are explaining is positive or negative. Theories of meaning making, for example, argue that people have a need for certainty that compels them to understand themselves and the external environment and that uncertainty is a source of threat (Heine, Proulx, & Vohs, 2006; Kruglanski & Webster, 1996; Pyszczynski, Greenberg, & Koole, 2004; Sorrentino & Roney, 2000; van den Bos, 2004). Indeed, human beings have a strong proclivity to understand, predict, and control their environments, and a failure to do so is often aversive. Virtually all tests of these hypotheses, however, have examined people's understanding of negative events. The AREA model is unique in predicting that explanation also leads to the diminution of affective reactions to positive events.

We predict that anything that impedes explanation—such as uncertainty—should prolong affective reactions to positive events. To test this pleasure of uncertainty hypothesis, Wilson, Centerbar, Kermer, and Gilbert (2005) manipulated how certain people were about the nature of positive events. As predicted, people in the uncertain conditions had more long-lasting positive reactions. In one study, for example, people watched an abridged version of the movie *Rudy* (Anspaugh, 1993), which is based on the true story of a man who fulfills his life dream of playing football at Notre Dame University. After viewing this upbeat film, all participants read two accounts of what happened to Rudy in real life after he graduated from college. These accounts were pretested to be equally positive, though they differed in their details; in one, Rudy remained in the Midwest and raised a family, and in the other he moved to New York and became a community speaker. In the certain condition, participants were told which version (either the family man or community speaker version, counterbalanced) was true. In the uncertain condition, participants were told that one version described Rudy and the other described one of his teammates, but it was unclear which version described which person. All participants rated their mood, worked on a filler task for 5 min, and rated their mood again.

As seen in Figure 2, people in both conditions reported a relatively positive mood right after seeing the movie and reading the two versions of Rudy's life story. Over the next few minutes, however, people who did not know which of the two stories was true felt better than did the people who did know. Why did this happen? Once people knew which story was true, they presumably started to explain it by connecting that story with what they knew about Rudy and making the entire narrative

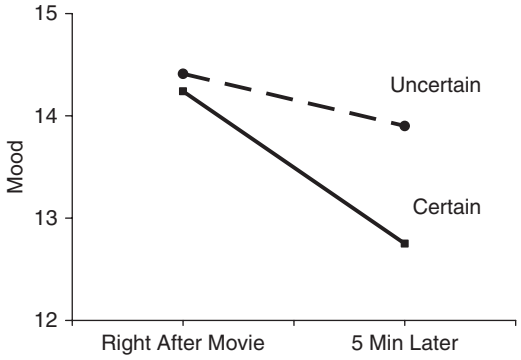

Fig. 2. Reported mood as a function of time and uncertainty about which account of the movie character was true. Means are ratings of how happy, pleased, and cheerful people felt on a 21-point scale. Higher numbers reflect a more positive mood. Adapted from Wilson et al. (2005).

understandable. As a result, their thoughts moved on to other matters, such as what they planned to do later that day. People who did not know which story was true could not as easily make sense of Rudy's life, and thus they were more likely to dwell on the movie and the positive feelings it produced. Consistent with this interpretation, people in the uncertain condition reported having thought about the descriptions of Rudy's life significantly more than did the people in the certain condition.

Wilson et al. (2005) replicated these results with different manipulations of mood and uncertainty. In one study, college students read text messages from three opposite-sex students who had evaluated them positively. People who were uncertain about which student had authored each message remained in a positive mood longer than did the people who knew which student had authored each message. In a field study, participants studying in the library were given an index card with a dollar coin attached to it. In the uncertain condition, the text on the card conveyed vague information about the source and purpose of the money, such as "The Smile Society," "A Student/Community Secular Alliance," and "We Like To Promote Random Acts of Kindness." In the certain condition, the text on the cards was identical except that a question preceded each piece of information, namely "Who are we?" and "Why do we do this?" Although these questions provided no additional information, Wilson et al. (2005) hypothesized that the familiar question-and-answer format would appear to explain the source of the gift and why it was being given (Langer, Blank, & Chanowitz, 1978), making it easier for people to feel that they had explained the gift. Consistent with this hypothesis, Wilson et al. (2005) found that when the participants were approached by a second experimenter 5 min later and asked to complete a brief survey, the people who had received the "certain" card reported a less positive mood than did those who had received the "uncertain" card.

These studies highlight a pleasure paradox, which refers to the fact that people have two fundamental motives—to understand the world and to maintain positive emotions—that are

sometimes at odds. Wanting to understanding the world is a powerful motive and is critical to reexperiencing positive events. When a college professor gives an unusually good lecture, for example, keeping her students on the edge of their seats for the entire hour, it is to her advantage to understand why she was so effective so that she can be as spellbinding the next time. The more she analyzes and understands her performance, however, the less extraordinary it will seem and the less pleasure she will derive from it. John Keats recognized this fact, suggesting that a person of "achievement" is one who is "capable of being in uncertainties, Mysteries, doubts, without any irritable reaching after fact & reason" (Bush, 1959, p. 261).

The most direct evidence for the pleasure of uncertainty hypothesis comes from a study in which people saw clips of movies that elicited positive affect and were primed with thoughts about uncertainty or certainty (Bar-Anan, Wilson, & Gilbert, 2008). Ostensibly as part of a study on distraction while watching films, participants were asked to repeat certain phrases while watching brief movie clips. The clips portrayed positive events, though the story behind the events was not clear (e.g., one was scene from *Chariots of Fire* in which a man wins a running race). Participants repeated phrases connoting uncertainty ("I wonder," "huh?", "I don't get it") or phrases connoting certainty ("I see," "that makes sense," "of course"). As predicted, participants reported more positive feelings toward the clip when they uttered the uncertain phrases. A separate group of participants, who rated the positivity of the phrases, found the uncertain phrases to be more negative than the certain ones, suggesting that the results of the main study were not due to classical conditioning. Rather, repeating the uncertain phrases appears to have made people more curious about the film and thereby increased their enjoyment of it.

The AREA model makes other counterintuitive predictions. For example, it suggests that under some conditions, people will be happier receiving one desirable gift than two. Kurtz, Wilson, and Gilbert (2007) asked college students to rate their preference for several gifts, such as a box of chocolates, a disposable camera, and a coffee mug. Participants then learned that they would receive (a) one of their two favorites and were told which one it would be (one gift/certain condition), (b) one of their two favorites but were not told which one until the end of the study (one gift/uncertain condition), or (c) both of their favorites (two gifts/certain condition). As predicted, people in the one gift/uncertain condition remained in a good mood for the longest period of time. When people knew which gift(s) they would receive, they could make sense of it (e.g., "oh nice, the camera, I'll take pictures of my roommate later"), thus reducing the need to think about it further. When people did not know which gift they would receive, the sense-making process was held in abeyance, making thoughts about the gifts more accesible. In keeping with this prediction, the researchers found that people in the uncertain condition spent the longest time looking at photographs of the gifts when they were displayed on a computer.

In the Wilson et al. (2005) and Kurtz et al. (2007) studies, people knew that a positive outcome had occurred (e.g., Rudy's life turned out well, they received positive feedback from their peers, they received a dollar, they received one of their favorite gifts), but they were uncertain about which positive outcome or about why it had happened. But people are often uncertain about whether an outcome will be good or bad. People make marriage proposals without being certain about whether they will be accepted and interview for jobs with no guarantee that they will be offered a position. According to the AREA model, uncertainty increases the accessibility of thoughts about an event and the intensity of one's reactions to them. Thus, a key question concerns the valence of thoughts that remain accessible. Because the events were unambiguously positive in the Wilson et al. (2005) and Kurtz et al. (2007) studies, the uncertainty manipulations were hypothesized to increase the accessibility of positive thoughts, thereby prolonging people's good moods. But when the valence of an outcome is uncertain—such as whether a marriage proposal will be accepted—people's thoughts should vacillate between the positive ("she might say yes!") and the negative ("but she might choose Harry over me"). Under these conditions, uncertainty should thus have mixed or even negative effects on people's affect because it should increase the accessibility of negative thoughts.

Suppose, however, that people are fairly certain that an outcome will be positive but that some degree of uncertainty remains (e.g., there is a 70% chance they will receive a prize). Common sense (and expected utility theory) suggests that people who are 70% certain that a good outcome will occur should be less happy than people who are 100% certain. According to the AREA model, however, thoughts about the prize will be more accessible to people in the 70% condition, and the key is whether these thoughts are positive or negative. If the alternative to the positive outcome is neutral rather than negative, some uncertainty about the outcome might result in an increased accessibility of positive thoughts. Thus, if people are 70% certain that they will win a prize and the alternative is the status quo (not having a prize), they may focus on the possibility of winning, thus prolonging positive feelings. If people are 70% certain that they will win a prize and the alternative is negative (e.g., losing a large sum of money), they may focus on the possibility of losing, thus prolonging negative feelings.

Whitchurch, Wilson, and Gilbert (2008) performed an initial test of this hypothesis to see if there are circumstances under which uncertainty about a positive outcome is more pleasurable than certainty. Participants took a saliva test to detect the possible presence of a newly discovered (actually fictitious) rare hormone that helps people work under pressure and confers an advantage in academic and professional settings. People in the certain condition learned that they definitely had the hormone, people in the uncertain condition learned that the test was positive for the hormone but that it was only 70% reliable, and people in the control condition did not receive any feedback. As

predicted, people in the uncertain condition were in a more positive mood than were people in the other two conditions. Whitchurch et al. also predicted that people in the uncertain condition would be more distracted while subsequently listening to a segment of a book on tape because they were continuing to think about the hormone test. In fact, people in the uncertain condition did significantly less well on a recall task about the segment than did people in the certain or control conditions.

This study provides preliminary evidence for the hypothesis that uncertainty about whether a positive outcome has occurred can be more pleasurable than certainty, a prediction that is unique to the AREA model. To be sure, several questions remain: What degree of uncertainty is necessary to get this effect (e.g., would it occur if people were 50% certain that they had the hormone?), and would it occur if the alternative were negative (e.g., that they had a hormone with negative effects) rather than relatively neutral (e.g., that they did not have a rare positive hormone)?

IMPLICATIONS AND FUTURE DIRECTIONS

The AREA model explains a wide range of findings in the literature on emotional reactions to negative events and it makes unique predictions about emotional reactions to positive events, many of which have been confirmed. The model raises a number of additional questions that we will now discuss briefly.

To What Kinds of Events Do People Adapt Most Quickly? There has been a great deal of research on affective adaptation conducted in specific domains on such topics as the speed with which people adapt to the death of loved ones (Stroebe & Hansson, 2001), debilitating diseases (e.g., Baron et al., 2003; Lacey et al., 2004; Lucas, 2007); incarceration (e.g. Zamble, 1992), noise (e.g., Cohen & Weinstein, 1981), unemployment (Lucas, Clark, Georgellis, & Diener, 2004), divorce (Lucas, 2005), and, on the positive side, marriage (e.g., Lucas, Clark, Georgellis, & Diener, 2003), increases in income (Diener & Biswas–Diener, 2002), and winning lotteries (e.g., Brickman, Coates, & Janoff-Bulman, 1978). Reviewers of these literatures have observed that people appear to adapt more easily in some domains than they do in others; for example, Frederick and Loewenstein (1999) noted that people adapt more easily to incarceration than to unpleasant noises, and Lucas et al. (2004) found that losing one's job is particularly difficult to adapt to and has a long-term impact on life satisfaction.

The AREA model provides at least a partial answer as to why this is: The more easily one can explain and understand an event, the more quickly one will adapt to it. Examining the conditions that promote or inhibit explanation helps explain why people adapt more quickly to some kinds of events than others. We illustrate this point by discussing research on noise.

Several studies have found that people do not adapt to the negative effects of noise (Frederick & Loewenstein, 1999). Weinstein (1982), for example, interviewed people 4 and 16 months after a noisy highway opened near their home. Contrary to an adaptation prediction, there was no reduction over time in ratings of how distracting and annoying the noise was. In fact, there was a small but significant increase in these ratings over time. Similar results were found in a study that compared children who attended schools near a noisy airport with children who attended quiet schools. The children who attended the noisy schools exhibited deficits on cognitive, motivational, and physiological measures, and there was little evidence that these deficits decreased over time (Cohen, Evans, Krantz, Stokols, & Kelly, 1981).

Noise from highways and airports, we suggest, meet the conditions that make an event difficult to adapt to, such as variability and the lack of predictability. The types of noise vary over time (e.g., the loud roar of an 18-wheeler driving by at 70 miles an hour vs. cars honking), and these noises occur at unpredictable times. Such noises would probably be less annoying if they were always the same and occurred at set, predictable times (e.g., if trucks always came at the hour and half hour). It is also possible, of course, that when noises get above a certain decibel level they attract attention, regardless of how predictable or familiar they are. Workers on an airport tarmac are unlikely to avoid noticing the 120-dB sound of a jet taking off, even if they have experienced this sound hundreds of times before. Nonetheless, the predictability, novelty, variability, and ease of explaining the sound should make a difference. Tarmac workers would likely attend and react more to an unexpected, difficult-to-explain 120-dB noise (e.g., live rock music coming from the runway) than to the sound of yet another jet taking off.

As these examples illustrate, there may not be anything intrinsic about noise that makes it difficult to adapt to; rather, the question is whether noise meets the conditions that attract attention and defy explanation. People may well adapt to sounds that are predictable, have been heard many times before, change little from one time to the next, and are easily assimilated to their prior schemas, such as the sound of a clock ticking or the noontime whistle at a factory. In line with this reasoning, several studies have found that people adapt quickly to noises that are predictable (Cohen & Weinstein, 1981; Kjellberg, Landstrom, Tesarz, Soderberg, & Akerlund, 1996) or familiar (Broadbent, 1979; Cohen & Weinstein, 1981).

This analysis suggests why cell phone conversations can be so annoying. We automatically try to understand the conversation but have difficulty doing so, because we only hear one side of it. If people could hear both sides of the conversation—as they can when hearing two people chatting on a bus, for example—they could more easily tune it out. In most instances, they would determine that the conversation was not important to them and would succeed in ignoring it. Previous research has supported this hypothesis (Monk, Carroll, Parker, & Blythe, 2004). People who overheard a stranger speaking on a cell phone rated the conversation as more annoying and difficult to ignore than did people who heard both sides of the same conversation.

Emotions Versus Moods

We have used the term *affective reactions* broadly to refer to people's valenced reactions to events. The AREA model helps explain the time course of different kinds of affective reactions—namely, emotions versus moods. The chief difference between emotions and mood is that the former are attributed to specific objects and the latter are not (Clore & Gasper, 2000). A person who attributes her negative affect to the fact that her goldfish has died will feel the emotion of sadness, whereas a person who has negative affect but is not sure why will be in a more generalized negative mood. Clore and Gasper (2000) suggest that the more unconstrained negative affect is (that is, the less it is attributed to a specific source), the longer it will last, which is consistent with our theorizing. Once the person attributes her sadness to the goldfish, she can begin to achieve an understanding and explanation of the event (e.g., "Goldy had a full life, and I guess it was his time"), leading to an attenuation of the sadness. When she has no idea why she feels the way she does, the negative affect will last longer and is likely to be attached to a broader array of events in her life. The AREA model also helps explain why some specific emotions last longer than others, a topic that has not received much attention in the emotion literature (Frijda et al., 1991; Scherer, 2001b). Some affective states, such as depression or irritability, are more akin to moods, in that they are not attributed to a single object. As discussed earlier, this fact may help explain why these states tend to last longer than do those attributed to specific causes.

Cultural Differences in Affective Experience

The AREA model predicts that the more easily people can explain events, the shorter the duration of their affective reactions to them. This prediction is interesting to consider in light of evidence that members of East Asian cultures have a different explanatory style than do members of Western cultures. East Asians tend to reason holistically, taking into account both objects and the context in which they are embedded. They are more likely to engage in dialectical reasoning, which allows for and explains apparent contradictions. Westerners are more likely to think analytically, paying more attention to the object of attention and less to the surrounding context, and to prefer one explanation while rejecting competing ones (Nisbett, 2003; Nisbett, Peng, Choi, & Norenzayan, 2001).

One implication of these different systems of thought is that East Asians might be less likely to experience surprise when they encounter evidence that is inconsistent with their expectations. Because contradictions are more easily accounted for in a system of dialectic thought, they can assimilate the new information into their belief system, even if that information is inconsistent with their prior expectations. Choi and Nisbett (2000) found support for this hypothesis in studies of American and Korean college students. When given information that directly contradicted their initial hypotheses, Koreans expressed significantly less surprise than did Americans. Further, Koreans showed a stronger hindsight bias than did the Americans, overestimating how predictable the outcome was in advance, once they knew it.

Because explanation reduces the intensity and duration of affective reactions, the AREA model predicts that East Asians should have shorter and less intense affective reactions to unexpected events than do Westerners. An unexpected event is likely to seem surprising to a Westerner and will require more work to explain and thus have a relatively large emotional impact. The same event is likely to seem unsurprising and predictable to an East Asian and thus have less of an emotional impact. Support for this hypothesis was found in a study by Mesquita and Karasawa (2002), in which American and Japanese college students completed questionnaires about their emotions four times a day for a week. Unlike most studies of this type, the students were given the option to report that they had not experienced any emotion during the previous few hours. As the AREA model predicts, the Japanese college students were significantly more likely to choose this option than were the American college students. In another study, Chinese-American and European-American couples watched a videotape of a discussion they had just had with their partner about an area of conflict and made continuous ratings of how they had felt during the interaction on a dial that ranged from *extremely negative* to *neutral* to *extremely positive* (Tsai & Levenson, 1997). The Chinese-American couples showed significantly less variability in these affect ratings than did the European-American couples, which is consistent with the hypothesis that East Asians have less intense and shorter affective emotional reactions than Westerners do. Other studies have found evidence that this hypothesis is true for positive emotions but not for negative emotions; for example, Scollon, Diener, Oishi, and Biswas-Diener (2004) found that Asian-American and Japanese college students reported significantly less frequent and less intense positive emotions over the course of a week than did European-American college students. However, there were no significant differences between these groups in the frequency or intensity of negative emotions (see also Kitayama, Markus, & Kurokawa, 2000).

Cultural influences on emotional experience are undoubtedly complex and involve factors other than explanation, such as the tendency for European Americans to emphasize positive emotions over negative ones, the tendency for Asians to emphasize emotions that involve engagement with others, and the tendency for cultural differences to occur more often in social than nonsocial contexts (Kitayama et al., 2000; Tsai, Chentsova-Dutton, Freire-Bebeau, & Przymus, 2002). The AREA model suggests that the ease and speed with which people can explain surprising events also plays a role.

SUMMARY AND LIMITATIONS

We summarize the AREA model by discussing how it relates to the three principles of affective adaptation we reviewed earlier:

the antagonism, attention, and reference-point principles. First, we suggest that a key antagonistic process has been overlooked—namely the process of explanation and understanding, which serves to dampen emotional reactions. Whether the primary function of explanation/understanding is to regulate emotional responses, or whether it serves other functions (e.g., increasing people's ability to predict and control the future), is an open question. Nonetheless, explanation is vital to affective attenuation. Second, the AREA model incorporates and extends the attention principle of emotional adaptation by specifying the conditions under which people's attention will be drawn to events (i.e., when the events are self-relevant but poorly understood) and the conditions under which people no longer attend to events (when they succeed in explaining the event or decide that it is no longer self-relevant).

The AREA model does not incorporate the reference-point principle, which holds that people compare their current experiences with a reference point that changes as the event reoccurs. Instead, our approach shares with norm theory the idea that people do not necessarily come to their experiences with a reference point in mind and that they do not compare each experience with the past (Kahneman & Miller, 1986). Rather, people attempt to make sense of events as best they can, which might involve comparing them with their past experiences, but could also involve comparing them with hypothetical alternative scenarios or assimilating the event into their knowledge structures. As norm theory suggests, people who succeed in making sense of an event will view the event as "normal" and have little emotional reaction to it. If people cannot easily explain a self-relevant event, they will experience an emotional reaction. The AREA model extends norm theory by discussing what happens next. When people find an event to be self-relevant but difficult to understand and experience an emotional reaction, what determines the time course of that reaction? As we have seen, affective adaptation is a function of how successful people are at reaching an understanding of the event (i.e., assimilating it to their knowledge structures or accommodating their knowledge structures to account for the event).

It is important to note the limitations of the AREA model. As with any theory that posits the existence of nonconscious processing, the model suffers from the inability to directly measure these processes (i.e., the process of explanation and understanding). We have adopted the approach of all such theories, namely finding ways to manipulate the proposed process and making specific predictions about outcomes that can be observed. We believe we have been successful in this (e.g., in our studies of the pleasures of uncertainty), but it would be useful to develop new assessments of the consequences of successful versus unsuccessful attempts to understand emotional events. Further, it is clear that there is more empirical support for some parts of the model (e.g., the role of uncertainty in positive affect) than for others. For example, our hypothesis that self-relevant, poorly understood events receive priority in attention is consistent with the literature, but more direct tests of this hypothesis are needed.

Nor can the AREA model explain all cases of affective adaptation. As noted earlier, for example, adaptation can result from engaging in activities that distract people from a focal event and produce opposing emotions. Bereaved people might hasten their recovery by meeting new friends and developing new hobbies (Janoff-Bulman, 1992), and people who have had a bad day at work might bury themselves in a good book. To the extent that people can choose such distracting activities, they will adapt faster to negative events than to positive events, because people are typically more motivated to distract themselves from the former than the latter. Sometimes engaging in new activities is less voluntary (e.g., people must return to work after a vacation), leading to adaptation to both positive and negative experiences.

In addition, affect can be produced by low-level sensory reactions (e.g., to an unpleasant odor), and adaptation in such cases can result from changes in the sensitivity of sensory receptors. For example, olfactory adaptation has been found in organisms with limited central nervous systems, such as *Drosophila* larvae (Dalton, 2000). But cognitive processes can still influence sensory adaptation in human beings; one study found that people's expectations about the aversiveness of an odor influenced the speed of adaptation to it (Dalton, 1996). The extent to which the AREA model applies in such cases is an open question. For example, would people adapt more quickly to an odor that is well-understood, such as the aroma of baking cookies that one has just placed in the oven, than to the same odor that is less well-understood, such as the aroma of baking cookies coming from an adjacent office at work?

These examples raise questions about the breadth of the AREA model and what it means to "explain" or "understand" an emotional event. We have used one rubric for a heterogeneous set of cognitive processes and affective experiences, and it might be argued that our definition of explanation covers too broad a range of cognitive processes. We acknowledge this point and agree that the precise nature of and limits of the explanation process remain to be mapped. Nonetheless, we believe that an advantage of the AREA model is bringing a wide array of phenomena under one theoretical tent. For example, the model helps explain why people adapt to some kinds of events more quickly than they do to others and helps explain such diverse phenomena as bereavement and the process of psychotherapy. Further, we have identified a number of variables that facilitate or impede the explanation of an event (e.g., novelty, surprise, variability of an event, and uncertainty), allowing for empirical tests of the model. The most important point, perhaps, is that the model generates new, testable hypotheses, such as the pleasure of uncertainty hypothesis and theories of cultural differences in the intensity and duration of affective reactions. It is our hope that the AREA model will stimulate research on these and other important questions about why time "heals all wounds" and "dulls most pleasures."

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