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Bad Is Stronger Than Good

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The greater power of bad events over good ones is found in everyday events, major life events (e.g., trauma), close relationship outcomes, social network patterns, interpersonal interactions, and learning processes. Bad emotions, bad parents, and bad feedback have more impact than good ones, and bad information is processed more thoroughly than good. The self is more motivated to avoid bad self-definitions than to pursue good ones. Bad impressions and bad stereotypes are quicker to form and more resistant to disconfirmation than good ones. Various explanations such as diagnosticity and salience help explain some findings, but the greater power of bad events is still found when such variables are controlled. Hardly any exceptions (indicating greater power of good) can be found. Taken together, these findings suggest that bad is stronger than good, as a general principle across a broad range of psychological phenomena.

Centuries of literary efforts and religious thought have depicted human life in terms of a struggle between good and bad forces. At the metaphysical level, evil gods or devils are the opponents of the divine forces of creation and harmony. At the individual level, temptation and destructive instincts battle against strivings for virtue, altruism, and fulfillment. "Good" and "bad" are among the first words and concepts learned by children (and even by house pets), and most people can readily characterize almost any experience, emotion, or outcome as good or bad.

What form does this eternal conflict take in psychology? The purpose of this article is to review evidence pertaining to the general hypothesis that bad is stronger than good (see also Rozin & Royzman, in press). That is, events that are negatively valenced (e.g., losing money, being abandoned by friends, and receiving criticism) will have a greater impact on the individual than positively valenced events of the same type (e.g., winning money, gaining friends, and receiving praise). This is not to say that bad will always triumph over good, spelling doom and misery for the human race. Rather, good may prevail over bad by superior force of numbers: Many good events can overcome the psychological effects of a single bad one. When equal measures of good and bad are present, however, the psychological effects of bad ones outweigh those of the good ones. This may in fact be a general principle or law of psychological phenomena, possibly reflecting the innate predispositions of the psyche or at least reflecting the almost inevitable adaptation of each individual to the exigencies of daily life.

This pattern has already been recognized in certain research domains. This is probably most true in the field of impression formation, in which the *positive–negative asymmetry effect* has been repeatedly confirmed (e.g., Anderson, 1965; Peeters & Czapinski, 1990; Skowronski & Carlston, 1989). In general, and apart from a few carefully crafted exceptions, negative information receives more processing and contrib-

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utes more strongly to the final impression than does positive information. Learning something bad about a new acquaintance carries more weight than learning something good, by and large.

In other spheres, the effect seems present but not recognized. For example, nearly every psychology textbook teaches that propinquity breeds attraction. This conclusion is based on the landmark study by Festinger, Schachter, and Back (1950) in which the formation of friendships in a married students' dormitory was tracked over time. Contrary to elaborate hypotheses about similarity, role complementarity, values, and other factors, the strongest predictor of who became friends was physical propinquity: Participants who lived closest to each other were most likely to become friends.

Yet a lesser known follow-up by Ebbesen, Kjos, and Konecni (1976) found that propinquity predicted the formation of disliking even more strongly than liking. Living near one another increased the likelihood that two people would become enemies even more strongly than it predicted the likelihood that they would become friends. Propinquity thus does not cause liking. More probably, it simply amplifies the effect of other variables and events. Because bad events are stronger than good ones, an identical increase in propinquity produces more enemies than friends.

The relative strength of bad may also be relevant to the topics studied by research psychologists. As president of the American Psychological Association, Martin Seligman (1999) called for a "positive psychology" movement to offset the negative focus that he saw as dominating most of psychology's history. The negative focus was first documented by Carlson's (1966) survey of psychology textbooks, in which he found twice as many chapters (121 vs. 52) devoted to unpleasant as to pleasant emotions, and a similar imbalance was found in lines of coverage and use of specific words. More recently, Czapinski (1985) coded more than 17,000 research articles in psychology journals and found that the coverage of negative issues and phenomena exceeded positive, good ones 69% to 31%, a bias that was fairly strong across all areas of psychology (although weakest in social psychology). Seligman is probably quite right in proposing that psychologists have focused most of their theoretical and empirical efforts on understanding the bad rather than the good.

Why has this been so? Undoubtedly, one hypothesis might be that psychologists are pessimistic misanthropes or sadists who derive perverse satisfaction from studying human suffering and failure. An alternative explanation, however, would be that psychology has consisted of young researchers trying to obtain publishable findings in a relatively new science that was characterized by weak measures and high variance. They needed to study the strongest possible effects in order for the truth to shine through the gloom of error variance and to register on their measures. If bad is stronger than good, then early psychologists would inevitably gravitate toward studying the negative and troubled side of human life, whereas the more positive phenomena had to wait until the recent emergence of stronger methods, more sensitive measures, and better statistical techniques.

The goal of this review is to draw together the asymmetrical effects of bad and good across a deliberately broad range of phenomena. Even in topic areas in which this asymmetry has been recognized (as in impression formation), researchers have not generally linked it to patterns in other topic areas and may therefore have overlooked the full extent of its generality. The present investigation is intended to provide some perspective on just how broadly valid it is that bad is stronger than good. We certainly do not intend to claim that the greater power of bad things overrides all other principles of psychology. Other relevant phenomena may include congruency effects (good goes with good; bad goes with bad) and self-aggrandizing patterns (bad can be avoided or transformed into good). Nevertheless, the general principle that bad is stronger than good may have important implications for human psychology and behavior.

Definition implies rendering one concept in terms of others, and the most fundamental ones therefore will resist satisfactory definition. *Good, bad,* and *strength* are among the most universal and fundamental terms (e.g., Cassirer, 1955; Osgood & Tzeng, 1990), and it could be argued that they refer to concepts that are understood even by creatures with minimal linguistic capacity (such as small children and even animals). By good we understand desirable, beneficial, or pleasant outcomes including

states or consequences. Bad is the opposite: undesirable, harmful, or unpleasant. Strength refers to the causal impact. To say that bad is stronger than good is thus to say that bad things will produce larger, more consistent, more multifaceted, or more lasting effects than good things.

A Brief Discussion: Why Should Bad Be Stronger Than Good?

Offering an explanation for the greater power of bad than good is likely to be an inherently difficult enterprise. The very generality of the pattern entails that there are likely to be few principles that are even more broad and general. Meanwhile, researchers will have found lower level explanations that help explain why bad may be stronger than good with regard to specific, narrowly defined phenomena.

From our perspective, it is evolutionarily adaptive for bad to be stronger than good. We believe that throughout our evolutionary history, organisms that were better attuned to bad things would have been more likely to survive threats and, consequently, would have increased probability of passing along their genes. As an example, consider the implications of foregoing options or ignoring certain possible outcomes. A person who ignores the possibility of a positive outcome may later experience significant regret at having missed an opportunity for pleasure or advancement, but nothing directly terrible is likely to result. In contrast, a person who ignores danger (the possibility of a bad outcome) even once may end up maimed or dead. Survival requires urgent attention to possible bad outcomes, but it is less urgent with regard to good ones. Hence, it would be adaptive to be psychologically designed to respond to bad more strongly than good. After we review the evidence for the phenomenon of bad being stronger than good, we present a more complete discussion of the theoretical reasons for the strength of bad over good and also review other theories that have been proposed in the context of specific subareas (e.g., impression formation).

Evidence

The purpose of the following sections is to review evidence pertaining to the central hypothesis that bad is stronger than good. To establish the breadth of the pattern, we try to identify many seemingly different and diverse spheres in which bad is stronger than good. Given the breadth of the hypothesis, it is probably not possible to cover every study that has ever found bad to be stronger than good in any sphere. We have, however, tried to cover as much as possible and to provide evidence for the effect in as many different spheres as possible. How did we accomplish this? Unlike more focused narrative reviews or meta-analyses, we were unable to conduct a systematic search using keywords such as *good* or *bad*. Instead, we made an effort to cast as broad a net as possible and then focus our search on several research areas. As part of this process, we made a request via e-mail to the members of the Society for Personality and Social Psychology list-serve. The roughly 100 responses received from these members served as a starting point for our search. After dividing our review into several topic areas, we then set out to uncover those studies that compared the relative strength of good and bad effects, especially those that also included a neutral control group.

The central goal of this review is to establish convergence across multiple areas. The consistency of conclusions across each area is more important than the robustness or methodological strength of evidence in each specific area. We attempt to do justice to each area, but our emphasis is on breadth (and on the quest for any patterns in the opposite direction), so it seemed desirable to cover as many different areas as possible.

Reacting to Events

All lives contain both good and bad events. If bad is stronger than good, then the bad events will have longer lasting and more intense consequences than good events. In particular, the effects of good events should dissipate more rapidly than the effects of bad events. This should occur despite the mechanisms described by Taylor (1991), by which many people strive to minimize bad events and distance themselves from them, although those minimizing processes should limit the impact of bad events and possibly produce some contrary findings.

A widely accepted account of the impact of life events was put forward by Helson (1964)

and called *adaptation level theory*. In this view, the impact of substantial changes in life circumstances is temporary. People (and animals) react more to changes than to stable conditions, so they are most sensitive to new conditions. Change, therefore, produces strong reactions, but the circumstances that result from the change gradually cease to elicit a reaction and eventually become taken for granted. Applying this theory to human happiness, Brickman and Campbell (1971) postulated a "hedonic treadmill" by which long-term happiness will remain roughly constant regardless of what happens because the impact of both good and bad events will wear off over time.

In testing the hedonic treadmill, however, it emerged that bad events wear off more slowly than good events. Brickman, Coates, and Janoff-Bulman (1978) interviewed three groups of respondents: people who had won a lottery, people who had been paralyzed in an accident, and people who had not recently experienced any such major life event. The lottery wins and accidents had occurred about 1 year before the interview. Confirming the hypothesis for positive events, the lottery winners did not report greater happiness than the two other groups. Brickman et al. proposed that this result was due to habituation, as the adaptation level phenomenon would predict: The euphoria over the lottery win did not last, and the winners' happiness levels quickly returned to what they had been before the lottery win. Ironically, perhaps, the only lasting effect of winning the lottery appeared to be the bad ones, such as a reduction in enjoyment of ordinary pleasures.

In contrast to the transitory euphoria of good fortune, the accident victims were much slower to adapt to their fate, Brickman et al. (1978) found. They rated themselves as significantly less happy than participants in the control condition. The victims continued to compare their current situation with how their lives had been before the accident (unlike lottery winners, who did not seem to spend much time thinking how their lives had improved from the bygone days of relative poverty). Brickman et al. called this phenomenon the "nostalgia effect" (p. 921).

The seeming implication of these findings is that adaptation-level effects are asymmetrical, consistent with the view that bad is stronger than good. Adaptation-level effects tend to prevent any lasting changes in overall happiness and instead return people to their baseline. After a short peak in happiness, people become accustomed to the new situation and are no more happy than they were before the improvement. After a serious misfortune, however, people adjust less quickly, even though many victims ultimately do recover (Taylor, 1983).

Comparison of unanticipated financial outcomes can equate the objective magnitude of events. Kahneman and Tversky (1984) had participants perform thought experiments in which they either gained or lost the same amount of money. The distress participants reported over losing some money was greater than the joy or happiness that accompanied gaining the same amount of money. Put another way, you are more upset about losing $50 than you are happy about gaining $50.

In a prospective study of stress in pregnant women, Wells, Hobfoll, and Lavin (1999) examined gains and losses of resources early in pregnancy and measured postpartum outcomes including depression and anger. Gains in resources had no significant effects, but losses produced significant effects on postpartum anger (even after controlling for anger at the time of initial measurement, which included anger at the loss of resources). Wells et al. also found that effects of subsequent losses of resources were significantly higher among women who had experienced the previous losses; whereas if they had not had the initial loss, the effect of the later loss was muted. These findings point to a snowballing effect of consecutive bad outcomes. Good outcomes did not produce any such effects.

Developmental and clinical observations likewise suggest that single bad events are far stronger than even the strongest good ones. Various studies reveal long-term harmful consequences of child abuse or sexual abuse, including depression, relationship problems, revictimization, and sexual dysfunction, even if the abuse occurred only once or twice (Cahill, Llewelyn, & Pearson, 1991; Fleming, Mullen, Sibthorpe, & Bammer, 1999; Silver, Boon, & Stones, 1983; Styron & Janoff-Bulman, 1997; Weiss, Longhurst, & Mazure, 1999). These effects seem more durable than any comparable positive aspect of childhood, and it also seems doubtful (although difficult to prove) that a single positive event could offset the harm caused by a single episode of violent or sexual abuse;

whereas the single negative event can probably undo the benefits of many positive interactions.

Sexuality offers a sphere in which relevant comparisons can perhaps be made, insofar as good sexual experiences are often regarded as among the best and most intense positive experiences people have. Ample evidence suggests that a single bad experience in the sexual domain can impair sexual functioning and enjoyment and even have deleterious effects on health and well-being for years afterward (see Laumann, Gagon, Michael, & Michaels, 1994; Laumann, Paik, & Rosen, 1999; Rynd, 1988; note, however, that these are correlational findings and some interpretive questions remain). There is no indication that any good sexual experience, no matter how good, can produce benefits in which magnitude is comparable to the harm caused by such victimization.

Turning from major experiences to everyday actions, we find the same pattern of greater power for the unpleasant than the pleasant events. A diary study by David, Green, Martin, and Suls (1997) examined the effects of everyday good and bad events, as well as personality traits. Undesirable (bad) events had more pervasive effects on subsequent mood than desirable (good) ones. Although each type of event influenced the relevant mood (i.e., bad events influenced bad mood, and good events predicted good mood) to similar degrees, bad events had an additional effect on the opposite-valence mood that was lacking for good events. In other words, bad events influenced both good and bad moods, whereas good events influenced only good moods. Similar findings emerged when David et al. compared neuroticism (associated with distress and negativity) and extraversion (associated with positivity). Neuroticism influenced both good and bad moods, whereas extraversion affected only good moods.

Further evidence of the greater power of bad events emerged from a 3-week longitudinal study by Nezlek and Gable (1999). Their participants furnished multiple measures of adjustment each day, as well as recording daily events. Bad events had stronger effects on adjustment than good events on an everyday basis. The superior strength of bad events was consistent across their full range of measures of adjustment, including self-esteem, anxiety, causal uncertainty, perceived control over the environment, and depressogenic cognitions about the future, the self, and life in general.

How long the impact of everyday events lasts was studied by Sheldon, Ryan, and Reis (1996). Bad events had longer lasting effects. In their data, having a good day did not have any noticeable effect on a person's well-being the following day, whereas having a bad day did carry over and influence the next day. Specifically, after a bad day, participants were likely to have lower well-being on the next day. Although the results are technically correlational, something must cause them, whether it is the bad day itself causing the subsequent bad day or some other cause producing the consecutive pair of bad days. Either way, the bad has stronger power than good because only the bad reliably produced consecutive bad days.

Even at the sensory level, bad events seem to produce stronger reactions than good ones. Expressive reactions to unpleasant, pleasant, and neutral odors were examined by Gilbert, Fridlund, and Sabini (1987). Participants smelled various odors while alone, and their facial expressions were videotaped. Raters then watched the tapes and tried to infer the odor from the facial reaction. Unpleasant odors were most accurately classified, partly because more facial movement was perceived in the unpleasant odor trials. Pleasant odors elicited more facial movement than neutral odors, but the neutral ones were still rated more accurately than the positive ones. Thus, responses to unpleasant odors were apparently stronger, at least to the extent that they could be accurately recognized by raters.

Perhaps the broadest manifestation of the greater power of bad events than good to elicit lasting reactions is contained in the psychology of trauma. The very concept of trauma has proven broadly useful, and psychologists have found it helpful in many different domains. Many kinds of traumas produce severe and lasting effects on behavior, but there is no corresponding concept of a positive event that can have similarly strong and lasting effects. In a sense, trauma has no true opposite concept. A single traumatic experience can have long-term effects on the person's health, well-being, attitudes, self-esteem, anxiety, and behavior; many such effects have been documented. In contrast, there is little evidence that single positive experiences can have equally influential conse-

quences. It is possible that such events have simply eluded psychological study, but it seems more likely that the lack of an opposite concept for trauma indicates the greater power of bad than good single events to affect people.

Although the findings from Brickman et al. (1978) and others reviewed in this section provide vivid and well-known indications that bad events produce stronger, more lasting reactions than good ones, some of the studies suffer from a possible asymmetry in the objective magnitude of the event. There is no way to ascertain objectively that winning a lottery is comparable in magnitude to becoming paralyzed by an accident. The diary studies have the advantage of having used all the events of the day, so these are methodologically more useful. Most convincing are the studies that attempted to ensure equal objective magnitudes (such as when people gain vs. lose the same amount of money) because these permit the firmest conclusions that bad events produce stronger reactions. Therefore, throughout the rest of this review, we emphasize studies that either did manage to equate the good and the bad events in terms of their objective magnitude or that took some broad, representative or exhaustive sample of events.

In summary, most findings indicate that people react more strongly to bad than good events. The evidence covers everything from minor everyday events and brief experimental exposure to aversive odors to major life events and traumas. Bad events produce more emotion, have bigger effects on adjustment measures, and have longer lasting effects.

Close Relationships

One of the central tasks and goals of human life is to sustain a network of close relationships characterized by mutual caring and pleasant, supportive interactions (e.g., Baumeister & Leary, 1995). Unfortunately, many relationships fail to last, and others are sometimes less than satisfactory. In this section, we review evidence about good versus bad patterns that contribute to the long-term relationship outcomes. Obviously, one would expect that bad, destructive characteristics of the relationship will hasten its demise; whereas good, constructive ones will preserve it. The relevant prediction goes beyond that, however: The harmful effects of the bad characteristics will exert more influence over the relationship outcome than the beneficial effects of the good characteristics.

People commonly believe that positivity of communication (as opposed to negativity) is associated with high relational satisfaction (e.g., friendships, marriages, partnerships, and families). In general, research findings are consistent with this assumption. People satisfied with their relationships communicate with more positive verbal behaviors (e.g., agreement, confirmation, constructive problem solving, politeness, expressing forgiveness) and nonverbal behaviors (e.g., smiling, head nodding, caring, or concerned voice; for more detailed descriptions of these behaviors, see Gottman, 1979; Riskin & Faunce, 1970; Rusbult, Johnson, & Morrow, 1986; Stafford & Canary, 1991; Ting-Toomey, 1983; Wills, Weiss, & Patterson, 1974). On the contrary, people dissatisfied with their relationships communicate with more negative verbal behaviors (e.g., insults, threats, or criticisms) and nonverbal behaviors (e.g., frowning or speaking in a cold hard voice).

More important, however, positive and negative communication have different impacts on relational satisfaction, and the negative are more decisive. To show this, John Gottman and his colleagues (Gottman, 1979, 1994) videotaped married couples in the laboratory and at home as they talked about a wide variety of topics such as how their day went, the nutritional value of certain foods, marital problems in general, and specific conflicts in their relationship. They then coded the couple's behaviors in categories (e.g., verbal, nonverbal, positive, and negative). The findings indicated that the presence or absence of negative behaviors was more strongly related to the quality of couples' relationships than the presence or absence of positive behaviors. Positivity and negativity were independent, in the sense that increasing one did not necessarily decrease the other. The important implication is that increasing positive behaviors in a relationship will not affect the relationship as much as decreasing negative behaviors. In another study in which videotaped marital interactions were used, Gottman and Krokoff (1989) found that negative interactions predicted marital satisfaction more strongly than positive interactions.

The effects of emotional interactions on changes in relationship satisfaction were exam-

ined by Gottman and Levenson (1986; Levenson & Gottman, 1983, 1985). They made videotapes of couples interacting, then showed the interaction tapes to the individuals and obtained ongoing ratings of affect through the interaction. Of particular interest were data on reciprocity, defined in terms of one person expressing a similar emotion or change in emotion right after the partner had indicated similar feelings. Reciprocity of negative affect was especially potent and in particular was more influential than reciprocity of positive affect. The greater influence of negative affect reciprocity was found with regard to differentiating happy versus distressed marriages (Levenson & Gottman, 1983). In a longitudinal follow-up 2 years later, the couples who had initially shown higher rates of negative affect reciprocity reported greater declines in relationship satisfaction, whereas reciprocity of positive affect had no significant effect (Levenson & Gottman, 1985). In summary, relationships are most affected by patterns in which one person responds negatively to the other's negative act or feeling.

On the basis of these results, Gottman (1994) has proposed a revealing diagnostic index for evaluating relationships: He proposed that in order for a relationship to succeed, positive and good interactions must outnumber the negative and bad ones by at least five to one. If the ratio falls below that, the relationship is likely to fail and breakup. This index converges well with the thrust of our argument: Bad events are so much stronger than good ones that the good must outnumber the bad in order to prevail. Gottman's index suggests that bad events are on average five times as powerful as good ones, at least with regard to close relationships.

Constructive and destructive problem-solving behavior patterns for relationships were studied by Rusbult et al. (1986; see also Rusbult & Zembrodt, 1983). They were able to classify couples as to the degree to which they used constructive and destructive approaches to problems, and these were assessed independently so that a given couple might use both, either, or none. In a longitudinal design, Rusbult et al. showed that the destructive patterns were more predictive of relationship outcomes than constructive ones were. In particular, destructive responses to the partner's destructive responses showed a greatly increased predictive power. This finding confirms Levenson and Gottman's (1985) conclusion that reciprocity of bad responses is an especially potent predictor of relationship outcomes (and is stronger than reciprocity of good responses). The implication is that the long-term success of a relationship depends more on not doing bad things than on doing good things.

A similar conclusion emerged from a recent longitudinal study by Huston, Caughlin, Houts, Smith, and George (2001). By following couples for more than a decade, they were able to ascertain what features of early marital relationships predicted divorce (and other unhappiness) 10 to 12 years later. Huston et al. found that levels of negativity and distress early in the marriage were higher among the later divorcing couples than among the happily married ones. Positive relations during the early years of marriage, including love and affectional communication, did not differ significantly between the ones who ended up divorcing and those who ended up happily married. Without random assignment to early marital conflict (a technical and ethical impossibility), it is difficult to draw a firm causal inference from these data. It also remains possible that the early distress reflected some underlying conflict or even personality problem among the later divorcing spouses, but even that conclusion would fit the view that bad is stronger than good.

Even stronger results emerged from a 2-year longitudinal study by Huston and Vangelisti (1991). They measured three types of socioemotionally expressive behavior among newlywed couples: affectionate communication, sexual interest, and negativity. Sexual affection had no relation to marital satisfaction, and giving or receiving affection had only weak and inconsistent relationships to satisfaction. In contrast, negativity had strong and consistent links to global marital satisfaction. Thus, people's satisfaction with their marriage depended much more heavily on the bad parts (negativity) than on the good parts (affection and sex).

In support of this idea, sexual dysfunction was found to have a greater effect on the marital bond than good sexual functioning. McCarthy (1999) reported that when sexuality functions well within a marriage, it accounts for 15–20% of the variance in the marital bond, but when sex functioning is bad or nonexistent (which most married couples would consider a bad state), it accounts for 50–75% of the variance.

The power of bad sexual experiences, then, far outweighs the benefits of good sexual experiences within a marriage.

One factor that may contribute to some of these effects is that destructive behaviors are understood better than constructive ones. Acitelli, Douvan, and Veroff (1993) found that during the early years of marriage, couples perceived and understood each other's destructive behaviors better than the constructive ones. Acitelli et al. interpreted this as based on the greater visibility and recall of bad, destructive behaviors. As Kellermann (1984) has noted, however, such explanations are not theoretically complete because they fail to say why bad events are more readily noticed and recalled.

Daily reports of spousal behaviors and marital satisfaction were made for 2 weeks by participants in a study by Wills et al. (1974). Of the amount of variance (in marital satisfaction) that the predictor variables were able to explain in regression analyses, the majority (65%) was captured by the aversive, displeasurable behaviors. This was significantly greater than the amount explained by supportive, pleasurable behaviors (25%). This was true despite the fact that there were about three times as many positive behaviors as aversive ones. The greater power of the bad behaviors had to overcome their lesser number in order to produce a stronger effect.

Reciprocation patterns were also examined by Wills et al. (1974). Interspouse correlations indicated that negative, displeasurable behaviors were reciprocated to a significant degree, whereas the reciprocation of positive, pleasurable behaviors was weaker and not significant. This is an important step toward explaining the greater power of bad events to affect relationship outcomes: The couples' subsequent interactions are apparently more directly and consistently affected by bad than good behaviors. As with the daily events reviewed in the preceding section, couple interactions continue to be affected by bad more than good.

The relative contributions of stress (negative factors), social support (positive), and resources (positive) to the quality of family life were assessed in an extensive telephone survey by Pittman and Lloyd (1988). Both marital satisfaction and parental satisfaction were more strongly affected by the bad events (i.e., the stresses) than by the positive (i.e., support and resources). Thus, negativity and stress added more than 20% to the amount of variance in marital satisfaction that was explained, whereas positive support and resources added only 5%.

All in all, the evidence is fairly clear and unanimous in indicating that relationships are more affected by bad events than good ones. As seen in daily interactions, broad patterns, affect of problem solving, and marital communication, bad events have stronger effects than good events. Reciprocation of bad responses appears to be especially powerful for leading to deterioration and breakup of close relationships.

Other Relationships and Interactions

Although close relationships have received the greatest amount of study, there is also some relevant information regarding not-so-close relationships and other forms of interpersonal interaction. We report several such studies here, although the research on formation of initial impressions is covered in a separate section later in the article.

Sociometric studies have examined how individuals perceive each other within established groups or social networks. If bad is stronger than good, then dislike and social rejection should be more pronounced, which would be reflected in higher agreement throughout the social network. A meta-analysis of sociometric studies of children recently confirmed this conclusion (Newcomb, Bukowski, & Pattee, 1993). In particular, the two social extremes were represented by the highly popular children and the rejected children, and these were about the same proportions (9% and 12% of the groups, respectively, on average). Consistency of reports across the children, as well as for self-reports and for ratings by teachers and parents, was higher for the rejected than for the popular children. In other words, all perspectives agree more about who is rejected than about who is popular.

Another approach to the same problem is to examine the link between naming someone as "best friend" or "worst enemy" and overall ratings of ability. An ambitious study by French, Waas, and Tarver-Behring (1986) obtained extensive sociometric data from 250 third- and fourth-grade children. All children listed their three most and least desired friends, as well as listing the three best and worst peers at sports

and at schoolwork. All children then rated everyone in their class in terms of friendship, sports, and schoolwork. The proportion of variance shared by the two methods was consistently higher for the bad than for the good; that is, low ratings led to more frequent nominations as "undesirable friend," "bad at sports," and "bad at schoolwork" more reliably than high ratings led to more frequent nominations as "desirable friend," "good at sports," and "good at school."

Undoubtedly the initial acts in an interaction create expectancies and set the tone for further ones, and if subsequent acts differ, the expectancies are violated. The impact of these was assessed by Afifi and Burgoon (2000), who had participants observe a videotaped interaction. Their research design included changes from initially negative to positive and from initially positive to negative interactions. These violated expectancies produced strong reactions, but the violations in the negative direction had stronger effects on attraction. Their finding that changes produced stronger reactions than consistent interpersonal behavior replicated an earlier demonstration by Aronson and Linder (1965), but Afifi and Burgoon's work clearly showed that the shift toward the negative has a more powerful effect than the comparable shift toward the positive. That is, the largest change in attraction occurred when the stimulus person on the videotape started off by behaving in a friendly, interested manner and then turned aloof and unfriendly.

A further investigation by Reyes et al. (1999) showed that both social attraction and sexual desire were more strongly influenced by negative, unpleasant social interactions than by positive, pleasant ones. Participants who behaved in the unpleasant style produced clear (negative) reactions that were stronger than the reactions to people who showed a positive, friendly interaction style.

The notion that bad is stronger than good in social interactions received a fairly explicit test in a recent study. Exline and Baumeister (1999) had people play prisoner's dilemma against a simulated opponent who was randomly programmed to start off with either a cooperative (good) or a defensive/exploitative (bad) move. When participants were asked to rate their opponent, the one who started off with the bad move was rated as stronger than the one who started off with the cooperative move. Participants also rated the bad opponent as stronger than they themselves were, unlike the cooperative opponent.

In fact, when Baumeister and Leary (1995) reviewed the evidence in support of a need to belong, they concluded that that need was for nonnegative interactions, rather than positive ones as they had originally theorized. The reason was that neutral interactions seemed adequate to satisfy the need to belong in many cases. This too confirms the greater power of bad: The effects of positive, good interactions were not consistently different from the effects of neutral interactions, whereas bad ones were clearly different from the neutral.

Emotion

The distinction between good and bad (pleasant and unpleasant) emotions is well established in psychology and familiar to nearly everyone. Although laypersons typically regard these as opposites, there is some evidence that the two are somewhat independent (e.g., Watson & Tellegen, 1985), and indeed measures of affect intensity (e.g., Larsen, Diener, & Emmons, 1986) rest on the assumption that positive and negative emotions can be positively correlated within person, even though a person does not normally feel both at the same time. Diener, Larsen, Levine, and Emmons (1985) concluded that the seeming independence is produced by a combination of positive correlations in affective intensity and negative correlations in frequency. In any case, it is possible to compare positive and negative emotional states against neutral ones. The prediction is that negative affect and emotional distress will have stronger effects than positive affect and pleasant emotions, even when the two emotional states or traits are equally distant from the neutral position.

Language provides one index of relative power, although naturally language is subject to multiple determinants. To the extent that negative emotions are more powerful and important, they should be more fully represented in the language. Sure enough, there appear to be more words for negative than positive emotions. Averill (1980) constructed a Semantic Atlas of Emotional Concepts by an exhaustive compilation of 558 emotion words. When he had participants rate them, he found that there were one

and one-half times as many negative terms as positive ones (i.e., 62% negative vs. 38% positive), which differed significantly from the null hypothesis that there would be 50% of each. Averill also had three judges sort Anderson's (1965) list of 555 personality traits into emotional and nonemotional traits. He then evaluated them according to whether they fell above or below the midpoint on Anderson's original likeableness ratings. Among the nonemotional traits, there was a small preponderance of positive traits (57%), but among the emotional traits, the negative ones were in a clear majority (74%). Clearly, then, there are more words for bad emotions than for good ones.

A similar conclusion emerged (although tangentially) from a study by Van Goozen and Frijda (1993). They instructed participants in six different European countries and Canada to write down as many emotion words as they could think of within 5 min. The researchers then tallied the 12 most frequently mentioned words in each country. They reported that *joy, sadness, anger,* and *fear* (three of which are negative) were the ones that made all six countries' lists of the top dozen. If *surprise, excitement,* and *crying* are all treated as neutral (because they can be either positive or negative), all the countries except The Netherlands had more negative than positive words among the top dozen. Thus, when people try to think of emotion terms, they come up with a preponderance of words referring to negative emotions. This too suggests that bad emotions are more important to label and discuss than good emotions.

Other work has confirmed that there are many more words to indicate negative emotional states and differentiate among them than is the case for positive emotional states (Clore & Ortony, 1988; Russell, Fernandez-Dols, Manstead, & Wellenkamp, 1995). Thus, negative words appear to be more varied than positive words, or at least people seem to find it more important to recognize and label the distinctions between them.

Another sign of the relative power of bad versus good emotions is evident in research on affect regulation. People often try to change their moods and have many techniques for doing so. Naturally, there is an asymmetry to their goals: for purely hedonic reasons, people prefer to avoid bad emotions and obtain good ones. Those two goals can be separated, however, and one can examine the relative frequency and number of techniques for each. Doing so yields a clear difference: There are many more techniques people use for escaping bad moods than for inducing good ones. Baumeister, Heatherton, and Tice (1994) noted that there are six possible categories of affect regulation, consisting of efforts to induce, prolong, or terminate either a pleasant or an unpleasant state. Of these, however, efforts to terminate the unpleasant states are by far the most frequently reported. The fact that people exert disproportionate amounts of energy trying to escape from bad moods (and in particular more than they exert to induce good moods) is consistent with the hypothesis of greater power of negative emotions.

The effect of induced good and bad moods on cognitive processing (in connection with stereotypes) was studied by Esses and Zanna (1995). Across four studies, they consistently found that bad moods had a bigger impact than good moods, in terms of the discrepancies from the neutral mood condition. In some of the studies, this could be ascribed to a weaker difference among the mood manipulations. In Experiment 4, for example, the manipulation checks on self-reported moods did not yield any significant difference between the neutral and good mood induction conditions. In Experiments 2 and 3, the neutral mood condition yielded moods closer to the positive than the negative mood condition. In Experiment 1, however, the manipulation checks showed that the two mood manipulations were about equally far apart: In terms of the autobiographical narrative in the mood induction, the pleasantness of the positive, neutral, and negative conditions was 2.25, –.03, and –2.21, respectively, and the self-reported moods were 1.79, 0.69, and –.49. Despite the apparently equal departure in mood from the neutral condition baseline, the bad mood induction produced bigger effects on ethnic outgroup stereotypes: Only the negative mood induction produced stereotypes that differed significantly from the neutral mood baseline. Thus, when good and bad moods were equidistant from the neutral control, the bad moods were found to have the stronger effects.

Recall for positive versus negative emotions was studied by Thomas and Diener (1990), who compared diary and experience sampling data against the same people's general estimates of

their emotional experiences. They found that people tended to underestimate the frequency of positive affect, but not negative affect, which is consistent with the view that the relative weakness of positive emotional experiences makes them more forgettable. (It may also be, however, that positive affect is so much more frequent than negative affect and that the greater frequency accounts for the relative underestimation. Then again, Thomas and Diener did find that people were fairly accurate in estimating the ratio of relative frequency of positive versus negative affect.)

Likewise, recall for emotional events appears to favor bad ones. Finkenauer and Rimé (1998) asked people to recall a recent, important emotional event that they had either shared with others or kept secret. Although both positive and negative emotional events were welcome, and both were recalled, people reported far more bad than good events, by about a four-to-one margin across two studies. Thus, events involving bad emotions remain more salient on people's minds than events involving good emotions.

People's estimations of how long or intensely various events will affect them has been termed *affective forecasting* (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). Gilbert et al. found that, in general, people overestimate the extent to which events in their lives will affect them. Moreover, the data reveal that this phenomenon is stronger for negative events than for positive ones. These data suggest that people have a cognitive heuristic that informs them that negative events are powerful influences on subsequent affective states, more so than positive events, and therefore will affect them longer.

Children's understanding of emotional concepts was studied by Laible and Thompson (1998) in relation to attachment style. Not surprisingly, secure attachment was linked to better emotional understanding in the sample (age 2.5 to 6 years), but this effect was mainly found with negative emotions. Positive emotions were understood about the same in the various categories. The opposite finding might have been expected, given that secure attachment is presumably associated with more experiences of positive rather than negative emotions, but the results fit the pattern of bad emotions being stronger (or at least more important) than good ones. Laible and Thompson speculated that the effects were due to the greater need among nonsecurely attached (such as avoidant) children to avoid negative, unpleasant emotions, with the result that they are slower to develop an understanding of them. This interpretation was admittedly speculative. Still, it does rest on the assumption that bad emotions are more important than good ones, so children who do not have optimal attachment patterns find it more important to downplay bad emotions than to focus on good ones.

The emotional traits of positive and negative affectivity were studied by Major, Zubek, Cooper, Cozzarelli, and Richards (1997) in terms of their effects on adjustment following abortion. A commendable feature of Major et al.'s design is that they measured positive and negative outcomes separately, allowing for subjective well-being and personal distress to be assessed independently. Well-being was predicted by both positive and negative affectivity, and with roughly equal power. Distress, however, was only predicted by negative affectivity. Thus, negative affect influenced both outcome measures, whereas positive affect influenced only one.

There is also evidence that bad moods elicit more thorough and careful information processing than good moods (e.g., Clore, Schwarz, & Conway, 1994; Schwarz, 1990). These findings are consistent with Taylor's (1991) view that negative information stimulates a special set of processes designed to cope with threat. Yet even when a person is not threatened, bad moods seem to lead to greater processing. For example, Bless, Hamilton, and Mackie (1992) induced good and bad moods and then presented to participants information about someone else. They found that participants in good moods tended to cluster information and process it superficially, whereas people in bad moods processed it more carefully. Forgas (1992) extended this work to study the effects of good and bad moods on information about people who either conform to prototypes (stereotypes) or violate them (e.g., the engineer who is vs. the engineer who is not interested in football). The strongest mood effect involved the bad mood and the atypical, nonconforming person, which is precisely the combination that also elicited the most processing.

An exception to the general pattern of thorough, careful information processing during bad

moods was provided by Leith and Baumeister (1996). They focused mainly on high-arousal bad moods, in contrast to most prior work that has emphasized low-arousal moods such as sadness. Leith and Baumeister did, however, replicate the greater processing among sad participants. They found that highly aroused, aversive moods led participants to curtail information processing and make snap decisions when choosing what level of risk to choose (see also Keinan, 1987). Although this result did not conform to the general pattern of greater processing with bad moods, Leith and Baumeister still found that bad was stronger than good. The highly aroused, unhappy participants showed distinctive patterns of high-risk and self-defeating behavior, whereas good-mood participants did not differ from neutral-mood control participants.

Thus, there is an assortment of evidence that negative affect is stronger and more important than positive affect. People have more words for bad emotions than good ones and use them more frequently. Bad emotions generally produce more cognitive processing and have other effects on behavior that are stronger than positive emotions. People try harder to avoid and escape bad moods than to induce or prolong good moods, and they remember bad moods and emotions better.

Learning

Learning refers to behavioral or cognitive change resulting from situational contingencies. Reinforcement and punishment are the two main kinds of situational feedback that produce learning. Given the extensive research tradition in the study of learning, one might expect that the relative power of reward and punishment would be well established, but in fact we found it difficult to locate much in the way of direct comparisons. One reason is that most learning research has been performed with rats, in which food pellets are used for rewards and electric shock for punishments, and it is difficult to calibrate these so as to establish how many food pellets are equivalent to how many shocks.

Still, some researchers have examined the relative power of reward and punishment. In several older studies, researchers compared the effectiveness of reward-and-punishment contingencies on discriminative learning of tasks that require an active response from participants (in contrast with tasks that require the inhibition of a response). The punishment of incorrect responses (by the presentation of an aversive stimulus on mistakes) was consistently found to be more effective than the reward of correct responses: Punishment led to faster learning than reward, across a variety of punishments and rewards. Penney and Lupton (1961) and Penney (1968) used a loud tone as punishment, and Meyer and Offenbach (1962) and Spence (1966) used verbal punishments ("Wrong"). Spence and Segner (1967) compared nonverbal and verbal punishments (i.e., loud tone and "Wrong") with nonverbal and verbal rewards (i.e., candy and "Correct") and found that learning with both types of punishment contingencies led to superior learning as compared with learning with either type of reward contingencies. In other words, people learned more quickly from bad events (punishment) than from good ones (reward).

This work was extended in methodologically rigorous ways by Costantini and Hoving (1973). Children in the reward condition received an empty container and were instructed to win as many marbles as possible by doing a good job on different performance tasks (e.g., match identical figures). Children in the punishment condition received a container full of marbles and were instructed to lose as few marbles as possible by doing a good job on different performance tasks. This procedure is noteworthy because it equates reward and punishment in an important sense, insofar as the same number of marbles was contingent on performance. The only difference was that the child would gain marbles for success in one condition but lose marbles for errors in the other condition. (In contrast, the procedure of comparing candy rewards vs. loud noise punishments is susceptible to question about whether the rewards and punishments were of equal magnitude.) Because Costantini and Hoving were interested in how well children could learn to inhibit responses, the measures consisted of (a) walking as slowly as possible over a board lying on the floor and (b) waiting as long as possible to tell the experimenter after discovering matched animals. For both tasks, punishment contingencies (losing marbles) resulted in longer, more effective inhibition of responses than reward contingencies.

To explain these results, Costantini and Hoving (1973) suggested that the motivation to avoid losing something is greater than the motivation of gaining something. In our view, this conclusion is another way of saying that bad is stronger than good.

To examine whether the effectiveness of punishment on learning varies across developmental stages, Tindall and Ratliff (1974) conducted a study among 540 first (6.4 years), fourth (9.4 years), and eighth graders (13.5 years). Children were assigned to three conditions. In the reward condition, they received a token for correct responses (correctly identifying a particular figure). In the punishment condition, children were exposed to a loud noise for incorrect responses. In the reward–punishment condition, they received both a token for a correct response and a loud noise for an incorrect response. Children in the punishment condition performed significantly better than children in the reward and the reward–punishment conditions, with no significant difference between the two latter conditions. A main effect for developmental stage revealed that eighth graders performed better than the first and fourth graders, but developmental stage did not show any interaction with experimental condition, suggesting that punishment is relatively more effective than reward across all grade levels.

Textbooks in learning and education sometimes assert that reward is better than punishment for learning, but they do not provide a clear basis for this assertion. The assertion itself would provide an important contradiction to the general pattern of bad being stronger than good. Yet they may assert the superiority of reward over punishment because of various side effects of punishment, such as aggravation, anger, and even disorientation, any of which could interfere with optimal learning. Such interference could even occur because bad events are stronger than good ones and because bad events produce side effects, whereas good ones do not. In any case, the studies we have reviewed show that punishment is stronger than reward. We were not able to find studies showing the opposite.

Another way of testing the relative power of good versus bad in learning is to compare approach (good) and avoidance (bad) patterns. In an overview of the early research on these issues, Miller (1944) noted that both approach tendencies and avoidance tendencies grow stronger as the object becomes nearer, but one "fundamental principle" from many studies was that "the strength of avoidance increases more rapidly with nearness than does that of approach" (p. 433). Put another way, the avoidance gradient is steeper than the comparable approach gradient, which indicates the superior power of bad. Miller cited experimental studies by Brown (1940) that provided direct, precise tests of these variables, such as the examination of how hard rats would pull against a restraint in order to approach or avoid some stimulus. In some studies, Brown used both strong and weak versions of both the reinforcers and punishers, but even so the avoidance gradient for the weaker punisher was steeper than the approach gradient for the stronger reinforcer (see Miller, 1944, p. 435).

A similar conclusion was reached, in which human beings and different methods were used, by Kahneman and Tversky (1982). They examined the relationship between subjective and objective values of various possible outcomes, which they termed the *value function*. In general, Kahneman and Tversky concluded that the value function is steeper for losses than for gains. A given increase in possible loss therefore has a bigger impact on a decision than an objectively equal increase in possible gain.

One of the few ways to make reward and punishment comparable is to use money: Research participants receive money for some behaviors and lose money for others, and if the amounts are identical, one can establish which is stronger. This strategy was used by researchers in an approach–avoidance situation in connection with wagering and gambling. Atthowe (1960) had people choose among various possible wagers to see how their preferences varied. Some people were completely rational, in the sense of consistently making the choices with the best expected value. Others departed from rationality in either direction. The "conservative" individuals were defined by Atthowe as those whose choices reflected "an overconcern with the possibility of losing money" (1960, p. 4; thus, for them, bad was stronger than good). In contrast, people showing the "extravagance" pattern showed the opposite motivation, in which they emphasized the possibility of gain and disregarded the possibility of loss. Among the people in Atthowe's study who

were consistently nonrational in their choices, the vast majority (83%) fell into the conservative (i.e., loss-avoiding instead of gain-pursuing) category. Moreover, across the entire sample, the majority (71%) of all nonrational choices were conservative.

Similar findings with a different task were reported by J. L. Myers, Reilly, and Taub (1961): Choices were more affected by the chance of losing than by the chance of gaining money. Thus, although there does exist a minority of behavior that is driven more by seeking gains than by avoiding losses, the clear and consistent majority is primarily motivated by the effort to avoid loss, which implies that for most people, bad is stronger than good when it comes to financial outcomes.

Food likes and dislikes are among the most clear-cut and immediate reactions in humans. Pavlovian associative learning offers an explanation for the association between food and liking. In animal studies, it has been demonstrated that the flavor of a certain food (conditional stimulus) becomes intrinsically disliked after contingent presentation of this flavor with an unconditioned stimulus that produces nausea or vomit-producing reactions (Garcia & Koelling, 1966). This effect is known as *conditioned taste aversion learning.*

The relative power of good and bad associates in taste learning among human beings was investigated by Baeyens, Eelen, Van den Bergh, and Crombez (1990). Artificial flavors that were initially neutral in valence were paired with either an aversive, distasteful substance (Tween20 polysorbate 20) or a pleasant-tasting substance (sugar). After about 12 trials, the bad stimulus had induced participants to dislike the artificial flavors, and these effects were still discernible in a follow-up measure 1 week later. The pleasant stimulus failed to induce participants to like the flavors any better, nor was there any significant effect on the delayed measure. Thus, the bad stimulus had a stronger effect than the good one, in terms of learning.

Thus, there are several findings indicating that learning and conditioning are more strongly affected by bad things than good, even when the objective magnitude of good and bad is precisely equated. People appear to be predisposed to learn more rapidly and easily about the correlates of negative than of positive events.

Neurological Processes

Some evidence suggests that responses in the brain are stronger to bad than good things. Bartholow, Fabiani, Gratton, and Bettencourt (1999) examined event-related brain potentials (ERPs) in response to participants reading about people performing acts that were either consistent or inconsistent with personality descriptions. Larger amplitude P300 responses were observed following negative inconsistencies (i.e., people with positive traits performing bad behaviors) than positive inconsistencies (people with bad traits performing good behaviors). These amplitudes reflect degree of information processing and thus are consistent with the evidence of greater information processing.

Even more dramatic evidence comes from studies linking brain responses to learning and extinction of fear responses. Apparently fear-inducing events leave indelible memory traces in the brain (LeDoux, Romanski, & Xagoraris, 1989; Quirk, Repa, & LeDoux, 1995). Even after the behavioral response to a fear-inducing conditioned stimulus has been extinguished, the brain retains a changed pattern of neuronal firing in response to that stimulus and of neuronal connections between cells (Quirk et al., 1995; Sanghera, Rolls, & Roper-Hall, 1979).

In an investigation of the effect of reaction times during a forced-choice paradigm found that even patients with brain damage are affected by different types of feedback (Gauggel, Wietasch, Bayer, & Rolko, 2000). Brain-damaged patients with varying etiologies displayed faster reaction times after (false) negative feedback (an effect that remained even when statistically controlling for depression), suggesting that even among patients with profound brain damage, bad still outweighs good.

The existence of a specific brain mechanism to detect self-generated errors (Luu et al., 2000) also suggests that the brain is wired to react more strongly to bad than good. Errors and mistakes are, obviously, unintended responses and hence are more likely to lead to bad outcomes than good outcomes. Research confirms the existence of a neurological process that recognizes self-initiated errors. For instance, studies in which participants are asked to make continued response adjustments have shown that participants know they have made an error, even in the absence of feedback (e.g., Rabbitt,

1966). Moreover, there is a discernible change in the electrophysiological state of the brain that occurs soon after an error is made (within 80–100 ms). This brain response is measured by using ERP methods and is called *error-related negativity (ERN).* The results of another ERP study also support the existence of a neural marker for error detection (Miltner, Braun, & Coles, 1997). Using ERP methods, Miltner et al. found a pattern in the anterior cingulate—a neurological substrate thought to be central to self-regulatory abilities (see Posner, 1994)—similar to the negative pattern reported by Luu, Collins, & Tucker (2000). Moreover, Miltner et al. saw this neurological marker across three different sensory modalities (visual, auditory, and somatosensory), suggesting that our brains have a *generic* system for recognizing self-initiated errors.

Recently it has been suggested that ERN may "represent a means of tracking human self-monitoring in real time" (p. 45, Luu et al., 2000). It is noteworthy that errors, which themselves are bad (because they are unintended responses) and which are strongly linked to aversive consequences, appear to have a neurological correlate; whereas there does not seem to be an analogous neurological reaction for correct responses.

The effect of negative versus positive stimuli on neurological indices of evaluative categorization also supports our proposition that bad outweighs good. Using ERP methodology, Ito, Cacioppo, and Lang (1998) found that brain activation consistent with operations at the evaluative categorization stage changed as a function of the pleasantness and unpleasantness of visual images participants were viewing. Across two experiments, larger amplitude brain responses were found when viewing negative versus positive stimuli. Moreover, this effect occurred despite equating positive and negative stimuli with respect to probability, evaluative extremity, and arousal. That there were valance-related differences at the evaluative categorization stage (as opposed to the output stage, for example) indicates that bad outweighs good at a motivational level.

Although the evidence has only begun accruing, it suggests that the brain responds more strongly to bad than good things and that it retains the memory of bad things, even when the behavioral response has undergone extinction. The extinction of a fear response is therefore not a genuine case of unlearning, it merely reflects a behavioral adaptation. The organism retains the readiness to respond with fear again, so subsequent relearning of the fear response would be facilitated. Clearly, this would be an adaptive pattern insofar as once a threat is recognized, the person or animal will remember the threat more or less forever.

Child Development

Fairly little work is available to examine the relative power of good versus bad events on child development. An authoritative work by the eminent developmentalist Scarr (1992) directly addressed the effects of good versus bad environments on child development. She proposed that normal development depends on having an environment that falls within the normal range. Anything outside that range impairs development. Scarr cited "violent, abusive, and neglectful families" (1992, p. 5) as examples of such environments that can harm child development. The thrust of Scarr's argument was that having exceptionally good parents or a positive environment would not produce any better development than having average parents and an average environment; whereas having bad parents or a bad environment can inflict lasting harm. Thus, only the bad, and not the good, can produce effects that go beyond the average or normal.

Perhaps the most conclusive data come from cognitive and intellectual development. It is fairly well established that intelligence (IQ) is consistently correlated with social class, as well as being strongly influenced by genes and heredity (e.g., Jensen, 1998). The correlation with social class can be interpreted as fitting several different causal hypotheses, and indeed the controversial work by Herrnstein and Murray (1994) proposed that IQ is a decisive determinant of social class, because low intelligence leads to lower success in life. Other authors have, however, emphasized the opposite causal direction, proposing that social class affects IQ, either through the good effects of a well-off family or the harmful effects of growing up in a poor, disadvantaged environment.

Any effect of rich or poor families has to overcome the strong genetic contribution to IQ. Recently, some researchers have begun to ex-

amine how the relative contributions of nature and nurture (operationalized in terms of genetic heredity vs. shared family environment) may change as a function of social class. This permits a rather precise comparison of whether bad is stronger than good: Does the family environment overcome the genetic contribution more effectively in good or poor families? Put another way, one assumes that children start off with a genetic blueprint for a certain level of intelligence, and the crucial questions are whether good parents can increase their children's IQ above that level, whether poor parents can decrease their children's IQ below that same level, or both.

The educational level of parents was selected for investigation by Rowe, Jacobson, and Van den Oord (1999). Consistent with the view that bad is stronger than good, they found that the influence of family educational level (relative to heredity) was stronger at the low end. More precisely, the genetic heritability of intelligence (IQ) was strong and significant among highly educated families but was weak and nonsignificant among poorly educated families. The effects of shared environment on children's IQ showed the complementary pattern, with the effect of the shared family environment approaching zero among the highly educated families but having an appreciable and significant effect among the poorly educated families. Thus, a relatively poor family environment was able to overcome the genetic contribution to intelligence, but the good family environment had no effect and simply allowed the genes to determine the children's intelligence. Parents can make their genetically bright children less intelligent, but they cannot apparently make their unintelligent ones (or any others) smarter.

Similar results were obtained in another study using father's occupational level. Among the occupationally successful fathers, children's IQ depended mainly on genetic heredity, whereas with less successful fathers the family environment effect was strong and the genetic contribution was minimal (Thompson, Tiu, & Detterman, 1999). These findings converge with those of Rowe et al. (1999) and indicate that the effects of parenting and other environmental experiences on children are mainly negative: Bad family environments override the effect of genetic heredity on intelligence, but good environments do not—fitting the view that bad environments are stronger.

Thus, we do not have extensive data comparing good versus bad influences on child development, but the available data are methodologically quite strong because of the research design that separates environmental from genetic effects. The evidence is consistent with the view that bad is stronger than good.

Social Support

Over the past couple decades, the importance of social support has been established as central to health and well-being. Social support is usually defined in terms of emotional bolstering and practical assistance received from other people, particularly friends, relatives, and other relationship partners. Interactions with such individuals are not invariably positive, however, and certainly conflict, undermining, and other detrimental interactions are possible. If bad is stronger than good, we would predict that these aversive interactions with relationship partners will have a stronger impact on health, well-being, and other outcomes than will positive, supportive interactions. Given the general thrust of social support research toward showing positive, beneficial effects, the social support literature may be regarded on an a priori basis as a fairly hostile sphere in which to test the hypothesis about the greater power of bad things.

Various findings have indicated that negative or upsetting social support weighs more heavily than positive or helpful social support (e.g., Manne, Taylor, Dougherty, & Kemeny, 1997). One important approach has people furnish separate ratings of the good and bad behaviors of the members of their social network (e.g., being a source of conflict and distress vs. being helpful and optimistic). Fiore, Becker, and Coppel (1983) used this method and found that the degree to which a person rated his or her network members as upsetting was more predictive of depression than was the rated degree of helpfulness.

Similarly, Rook (1984) found that helpful aspects of the social networks of older widowed women were generally unrelated to psychological adjustment and well-being, but problematic, unhelpful aspects of the widows' networks were associated with lower levels of adjustment and well-being, even after controlling for sev-

eral demographic and health-related variables. More precisely, the number of interpersonal problems and the number of people who provided problematic or conflictual interactions both predicted (lower) well-being, whereas the number of sources of positive social support failed to predict anything (except loneliness, which seems a trivially obvious effect). Rook concluded that aversive social interactions have stronger effects on well-being than positive social interactions.

Using an older sample of both genders, Okun, Melichar, and Hill (1990) found stronger (correlational) effects for bad than good social ties and for bad than good daily events. The bad aspects of the social network predicted psychological distress more strongly than the good aspects. The independent contributions of good and bad aspects of one's social support network on people caring for a spouse with Alzheimer's disease were assessed by Pagel, Erdly, and Becker (1987) in a 10-month longitudinal study. They found that positive aspects (such as helpfulness) were unrelated to depression and social support satisfaction. Negative aspects such as upsetting interactions, however, predicted greater depression and lower satisfaction with the social network. Even after controlling for initial depression and initial problems, changes in negative aspects of social support over time predicted changes in depression.

Similar findings were reported by Finch, Okun, Barrera, Zautra, and Reich (1989). Their sample consisted of recently disabled or recently bereaved older adults and a matched control group. Positive social ties predicted positive well-being, whereas negative social ties predicted both well-being and distress.

The effects of social conflict and social support on coping with abortion were studied by Major et al. (1997). They concluded that conflict in close relationships had a greater impact than support on postabortion distress, although support in close relationships had a greater impact on postabortion well-being. These results fit an affect-matching view (i.e., good things have an impact on good feelings, whereas bad things have an impact on bad feelings) rather than the simpler blanket position that bad is stronger than good, so their results could be considered partly contrary to the main thrust here. Several features of their study prevent it from serving as powerful contrary evidence, though. For one, most of the disclosures were selectively aimed only at people who the women expected would be supportive: Women did not disclose the abortion to someone who was likely to be disapproving, so the range was severely restricted. Furthermore, the effects were obtained mainly after controlling for positive and negative affectivity, and these variables strongly colored the perception of social support and conflict. As noted previously, in terms of pure effects not already adjusted by valence, negative affectivity had a stronger impact overall than the positive, on both types of outcomes combined.

Social support and social conflict (undermining) were examined by Vinokur and van Ryn (1993) in a sample of people who had lost their jobs within the past 4 months, with follow-up questionnaires 2 months and 4 months later. Independent measures were given for social support and social conflict or undermining, and these had been designed to look at behaviors that would, in principle, have precisely opposite effects (i.e., restoring vs. diminishing self-worth). Despite the implicit parallel, the measures of social conflict and social support were not opposite ends of a single factor. They were negatively correlated at about –.70, but were found to be largely independent factors with quite different effects on other variables.

Most relevant were the effects on mental health, which was assessed by measures of anxiety and depression scales from a symptom index. Social conflict or undermining was significantly related to mental health at all three times, with correlations growing from .20 at Time 1 to .47 on the final survey 4 months later. In contrast, positive social support had a weak ($r = -.20$) relation to mental health at Time 1 and even weaker, nonsignificant relationships at later times. Thus, positive social interactions in the form of social support had only a weak effect on mental health, and only at first, whereas social conflict continued to have a strong (and, if anything, an increasing) effect on mental health throughout the period of study. Vinokur and van Ryn (1993) concluded that bad interactions are more influential than good ones: "Interpersonal conflicts that are expressed in undermining behaviors appear to have a stronger concurrent impact on mental health than supportive behaviors" (p. 358).

The separate effects of support and hindrance from one's social network were studied by Ruehlman and Wolchik (1988) in a large sample of undergraduates. They asked participants to choose the three adults who were most important to them in their current life situation and to report the degree to which these individuals supported and hindered the four most important personal projects and goals in the participant's current life. The researchers found that support and hindrance were largely independent, and indeed the correlations between support and hindrance by the same person ranged from .00 to .11. They found that project hindrance predicted both well-being (i.e., positive psychological functioning) and distress (negative psychological functioning). Project support, on the other hand, predicted only well-being. Although their findings represent only cross-sectional correlations, and causal interpretation is therefore necessarily speculative, these findings do point toward the same conclusion that bad events have more pervasive effects than good events. These results also fit the broader pattern in which bad events affect both good and bad outcomes, whereas good events only affect good outcomes.

The role of social support versus social conflict or undermining was studied in relation to several different sources of support by Abbey, Abramis, and Caplan (1985). With regard to the person closest to the respondent, bad was clearly stronger than good: Social conflict was related to three of the four measures of well-being, whereas social support did not correlate significantly with any of them. Likewise, when participants reported on support and conflict from "some one person," conflict predicted with more (four) indices of well-being, whereas support predicted only one. For the vaguest category, however, social support versus conflict with people in general, both support and conflict predicted well-being on almost all of the measures. These results suggest that bad is stronger than good when considering particular and important individuals, but across the broadly nonspecific social network, bad and good social relations were about equally important.

Supportive and negative interactions with spouses, friends, and relatives were also examined by Schuster, Kessler, and Aseltine (1990). Both types of interactions had effects on emotional functioning (measured in terms of a checklist for depressive symptoms). Comparison of the trends however suggested that the negative interactions had a stronger effect.

Taken together, thus these studies suggest that helpful aspects of one's social network bear little or no relation to depression, well-being, and social support satisfaction, while upsetting or unhelpful aspects do. Some findings fit an affect-matching view, in which positive interactions predict positive outcomes whereas negative interactions predict negative ones. Even in those findings, however, there appears to be an asymmetry: Bad interactions have stronger, more pervasive, and longer lasting effects.

Information Processing

The extent of information processing is an important indicator of power and importance. High motivation and pragmatic concerns cause people to process relevant information more thoroughly (e.g., Fiske & Taylor, 1991). Insofar as people are cognitive misers, they cannot afford to process all information to an equally full extent, so they must prioritize their cognitive resources and focus on what is important. If bad is generally stronger than good, then information pertaining to bad events should receive more thorough processing than information about good events. The greater information processing may be reflected in paying more attention to them and in elaborating them more thoroughly or constructing more extensive cognitive interpretations (such as attributions). The more extensive processing will also tend to lead to enhanced memory for bad material, although this tendency may sometimes be offset if the main goal and thrust of the processing involve defensive responses that retroactively minimize the bad events and thus conspire to erase them from memory (cf. Taylor, 1991).

Early evidence that bad things get more thought was provided by Klinger, Barta, and Maxeiner (1980). On a self-report scale, people claimed to devote more thought to their goals that were blocked than to other categories (including positive things). Threatened personal relationships and projects that had encountered unexpected difficulties topped the list of most frequent topics of thought.

The quantity of cognition in response to various interpersonal events was studied by Abele (1985). People engaged in more thinking and

reasoning about bad than good events. A further and noteworthy feature of Abele's research is that she also explicitly manipulated whether the event was expected or unexpected. This variable yielded its own main effect (unexpected events produced more cognitions), but it did not interact with valence. Thus, bad events elicit more processing than good events, even when the expectedness of the event is held constant. This suggests that the greater power of bad cannot be reduced to expectancy effects, contrary to one of the theories we have proposed.

Quantity (duration) of cognitive processing was measured by Fiske (1980), who showed people photographs of various behaviors that varied in positivity versus negativity. The ostensible purpose of the photographs was to form impressions. Participants spent longer viewing the photographs depicting negative than positive behaviors, suggesting that people paid more attention to bad than good acts when forming impressions.

More generally, it is generally assumed that people seek to understand events that happen to them, and attributional processing is part of this search for meaning (e.g., Baumeister, 1991; Frankl, 1963; Taylor, 1983). To find meaning, people can try to find a cause that provides them with an answer to the question as to why certain events happened or they can try to find a different interpretation and reframe their experiences. Some evidence suggests that negative events cause people to engage in greater search for meaning and making sense than positive events. Baumeister concluded from a broad review that unpleasant events stimulate the need for meaning to a greater degree than positive or pleasant events. An empirical test of the difference was conducted by Gilovich (1983), who examined spontaneous thinking about important outcomes. Participants in his study first placed bets on sporting events and either lost or won money. About 1 week after the event took place, they came back into the laboratory to settle their bets with the experimenter. They also provided tape-recorded accounts of their current thoughts about the games. The amount of time spent discussing the game was greater for the lost games than for the winning games. This difference reflects a greater search for meaning for bad than for good outcomes.

A similar conclusion emerged from a review of 17 studies on causal attribution by Weiner (1985). Spontaneous attributional activity was defined as people's efforts to explain what is happening to them and to identify a cause for what happened. In all studies in which positive events were contrasted with negative ones, spontaneous attributional activity was greater for negative (e.g., failures) than for positive events (e.g., successes).

Pratto and John (1991) set out to test whether attentional resources are automatically directed away from the current task when extraneous stimuli, either good or bad, are presented. Using a modified Stroop paradigm, the researchers presented participants with personality trait adjectives (e.g., sadistic, honest), and participants were instructed to name the color ink in which each word was printed. To the extent that attention was automatically seized by the meaning of the trait, participants would be slower to name the color. In the first study, people took longer to name the ink color when the word referred to a bad trait than when it was a good trait. Thus, the meanings of bad traits had greater power for attracting attention, as compared with good traits. Retrospective self-reports indicated that participants claimed they ignored the words and concentrated on the colors, which is consistent with the view that any interference occurred at an automatic and not a fully conscious level.

In a second study, Pratto and John (1991) replicated the greater interference by bad than good traits and also showed that people had greater memory for the bad than for the good traits: Participants were twice as likely to remember the bad ones than the good ones. This suggests that the automatic shifting of attention to the bad traits stimulated some incidental learning, resulting in the superior recall. In a third study, Pratto and John replicated the effects despite explicitly varying the base rates of good and bad traits, in order to rule out the hypothesis that bad information is stronger simply because it is more unusual. The manipulation of base rates (i.e., whether the stimulus set contained more good or more bad traits in total) was not significant, whereas the valence imbalance remained significant across different base rates. The authors concluded that bad information, at least in the form of undesirable trait terms, has more power than good information for attracting attention in an automatic, nonintentional fashion, and that this effect is not due to greater informativeness of diagnosticity

(based on generally positive expectations and base rates).

The greater attention to bad than good was shown in a different way by Graziano, Brothen, and Berscheid (1980). Participants received either a positive or a negative evaluation from another person. They viewed the other person's evaluation on videotape. Across conditions, all participants monitored the negative evaluation video for significantly more time (56% of the total time) than the positive evaluation video (44% of the total time). This difference was more pronounced when participants expected to interact with the other person as compared with when participants did not expect any future interaction.

Attention to emotionally expressive faces was studied by Oehman, Lundqvist, and Esteves (2001). Schematically drawn faces were presented in groups, and some of them had either a happy smiling face or a threatening, frowning face. Threatening faces were detected more quickly and accurately than the smiling faces under most conditions. A no-difference result was obtained under one condition (involving a background matrix of friendly faces and a short processing time), but overall the frowning faces were noticed better.

Another sign of the attentional priority of bad over good was furnished by Marshall and Kidd (1981), who conducted a series of studies asking whether participants preferred to hear good or bad news first, provided that both were forthcoming. Across several studies, they found a strong majority consistently (from 77% to 88%) asked to hear the bad news first. The greater processing of bad than good events was shown by Holtzworth-Munroe and Jacobson (1985) in the context of marital relationships. Participants generated lists of positive and negative events, frequent and infrequent, that were occurring in their marriage. They were then presented with various items from the list in random order and asked to list their thoughts and feelings that would occur if each event were happening right now. The aversive partner behaviors, regardless of whether frequent or infrequent, led to more attributional activity than positive partner behaviors.

The issue is somewhat more complicated in reactions to other people's emotion displays. Krull and Dill (1998) found that participants made more spontaneous trait inferences from other participant's happy rather than sad behavior. They speculated, however, that sad behavior can result from a variety of causes, so it is complex and not sufficiently unambiguous (diagnostic) to permit a spontaneous inference. In support of this conclusion, Krull and Dill reported that participants were significantly slower at making either inferences about the causes of sad behavior as compared with happy behavior. The slower reaction time is consistent with the general theme of greater processing with regard to negative than positive information. In plain terms, people can make snap judgments about someone who seems happy, but they engage in longer and more complex (but less conclusive) thinking about someone who seems sad.

The longer time taken for the attributions about negative behaviors may be related to the greater specificity of negative traits. Claeys and Timmers (1993) found that bad traits are more specifically and narrowly defined than good traits, in the sense that the bad traits are seen as more different from each other and encompass a narrower range of behaviors. The greater specificity of bad traits may be a linguistic sign of the greater power or importance of bad than good, parallel to the preponderance of words for bad than good emotions.

There is also some evidence that affective consequences of negative information are stronger than those of good information. Ikegami (1993) primed people by having them write first-person sentences containing friendly, hostile, or neutral words. The hostile priming had stronger and longer lasting effects on subsequent emotional states than either the positive or the neutral primes.

Some apparent exceptions may be found in the special category of bad feedback about the self, which people are motivated to avoid. Baumeister and Cairns (1992) found that repressors devoted less processing time to unfavorable personality feedback, under some conditions. The tendency to avoid bad feedback probably does not indicate any lack of strength on the part of the individual, however. More likely, it reflects a tendency to want to shield the self from the negative impact (such as potential loss of self-esteem). Even in this work, moreover, bad information did receive exceptionally long processing when it could not easily be dismissed and avoided, so even the apparent ex-

ception to the general pattern was found under only limited conditions.

The more extensive and elaborate processing of bad than good material has been amply confirmed in practical contexts outside of the laboratory, too. Among journalists and communication scientists, it is considered common knowledge that bad events are more newsworthy and attract more reader attention. Periodic calls for the news to focus more on positive, uplifting stories get nowhere, not because journalists are sadists or misanthropes, but because bad news sells more papers. Likewise, Fiedler's (1966/1982) authoritative history of novels included the pointed observation that no one has ever been able to make a successful novel about a happy marriage, whereas marital problems have filled countless novels. Thus, the most widely read classes of writers—journalists and novelists—both devote the bulk of their writing to elaborating bad rather than good events. Thus, bad information does receive more thorough information processing than good information. Bad information is more likely to seize attention, and it receives more conscious processing as well. The one exception to this general rule involves unflattering information about the self that some individuals such as repressors may simply avoid.

Memory

Memory should be most subject to a positivity bias, in view of the minimization processes that selectively erase bad memories (Taylor, 1991) and other repressive processes. Yet even with memory, there is some evidence that bad is stronger than good, although this effect is bounded by self-enhancement processes and mood-congruent recall processes.

Interviews with children and adults up to 50 years old (in separate studies) about childhood memories found a preponderance of unpleasant memories, even among people who rated their childhoods as having been relatively pleasant and happy (Kreitler & Kreitler, 1968).

Likewise, superior recall for unfavorable information was shown by Dreben, Fiske, and Hastie (1979). Regardless of serial position, sentences describing people's undesirable behaviors were recalled better than sentences describing desirable or neutral behaviors. The superior memory for bad than for good things was also found by Bless et al. (1992). Participants remembered bad behaviors better than good ones. Skowronski and Carlston (1987) also found that bad behaviors were recalled better than good ones, for both extreme and moderate levels.

On the other hand, biases that flatter the self make recall of one's own bad behaviors less likely. Skowronski, Betz, Thompson, and Shannon (1991) explicitly compared memory for everyday life events for both the self and for another person such as a friend whom the participant saw almost every day. They found no difference in recall for the friend's pleasant versus unpleasant events, but for the self there was a memory bias in favor of the pleasant events (although this was limited to events with intermediate typicality; typical and atypical events were recalled better, regardless of pleasantness). These findings suggest that there are certain memory biases that downplay bad experiences of the self but not of other people, consistent with Taylor's (1991) minimization hypothesis.

Also supportive of a motivation to minimize negative events are the findings from a study in which the researchers examined whether recollection of the emotional intensity of a personal event changed as a function on time and initial positivity or negativity of the event (Walker, Vogl, & Thompson, 1997). Walker et al. assessed participants' evaluations of personal experiences—both positive and negative—as they occurred and then reassessed their evaluations of these experiences at intervals of 3 months, 1 year, and 4.5 years. Consistent with previous findings (e.g., Holmes, 1970), they found that the affective intensity of a memory fades as time progressed and that this effect was especially true for memories of negative events. That is, the drop in intensity was steeper for memories of negative, compared with positive, events. Notably, the content of the memories remained intact over time. The researchers interpreted this finding as indicating that people effortfully target the emotional intensity of negative events, hoping to diminish their subsequent influence (see Taylor, 1991).

Cognitive psychologists have examined whether bad items are processed and remembered better than positive ones. Robinson-Riegler and Winton (1996) confirmed that participants showed better recognition memory for

negative than positive items. Furthermore, they were better able to recall the source of bad than good information, as shown by their ability to identify which stimuli had come to them in a second as opposed to a first phase; whereas the positive stimuli seemed simply to get all mixed together. These findings suggest that the bad material received more thorough processing when it was encoded and was, therefore, retained in a more complex, elaborate memory trace.

Ohira, Winton, and Oyama (1997) extended Robinson-Riegler and Winton's work by including measures of eyeblinks and latency, both of which have been associated with increased conscious processing. They too found that participants remembered (recognized) negative words more successfully than positive words. The negative words were also associated with slower responses and more eyeblinks, both of which indicate greater conscious processing. These findings fit the view that negative material evokes more extensive conscious activity, which in turn produces better memory for the material.

In contrast, there is evidence for mood-congruent recall for semantic material (for a review, see Matt, Vasquez, & Campbell, 1992). Nondepressed individuals show a bias toward recalling positively valenced stimulus words; depressed individuals recall equal numbers of positively valenced and negatively valenced stimulus words.

In summary, three psychological forces appear to collide in the human memory. The memory literature does supply limited evidence for the greater power of bad over good, but this does not appear to be the dominant force. This evidence coexists with a tendency for individuals to recall positive information (a self-enhancement effect), particularly when in a positive mood (a mood-congruent recall effect). This is true for self-relevant memories and semantic recall.

Stereotypes

A generalization about a category or group of people can in principle be either good or bad. Although undoubtedly some stereotypes are favorable, the majority of them appear to be negative and pejorative. This suggests that the process of forming and maintaining stereotypes is biased toward negativity, which would be yet another sign that bad is stronger than good.

One important source of stereotype formation and persistence is illusory correlation based on distinctive events. A meta-analytic review of 23 studies on this pattern was conducted by Mullen and Johnson (1990). They found that distinctive negative behaviors have stronger effects, in the sense of being better able to generate illusory correlations, than distinctive positive behaviors or neutral behaviors. In particular, minority groups (which are already salient by virtue of minority status) are likely to be assigned undesirable stereotypes based on illusory correlations.

One important sign of differential power would be the relative ease with which stereotypes are formed and disconfirmed, as a function of whether the stereotype is favorable or unfavorable. Rothbart and Park (1986) found strong correlations between the favorability of a trait and the number of instances required for its confirmation ($r = .71$) and disconfirmation ($r = -.70$). Specifically, the more unfavorable the trait, the fewer the number of instances required for confirmation and the greater the number of instances necessary for disconfirmation.

In other words, bad reputations are easy to acquire but difficult to lose, whereas good reputations are difficult to acquire but easy to lose. These findings suggest that unfavorable characteristics once acquired as part of a stereotype may be difficult to lose in part because a large number of observations are necessary for their disconfirmation. The findings certainly confirm that bad is stronger than good: It takes far more to overcome the bad than the good trait, and more to change the bad than the good reputation.

Forming Impressions

Impression formation is one of the few topics with which researchers have recognized and discussed a general pattern of valence imbalance (e.g., Kanouse & Hanson, 1972). The usual term is *positive–negative asymmetry,* indicating that bad information about a stimulus person or new acquaintance carries more weight and has a larger impact on impressions than good information (e.g., Peeters & Czapinski, 1990).

An early demonstration of this asymmetry was provided by Anderson (1965), who pre-

sumably hoped for different findings because he was trying to advance an additive and averaging model of impression formation. That is, he sought to show that people form impressions of someone by adding up and averaging all of the information they have about that person, good and bad alike.

To support his averaging model, Anderson (1965) provided participants with various personality traits that allegedly characterized a stimulus person. These traits had been given precise weights based on favorability ratings, so he carefully chose positive and negative traits that were equally distant from the neutral point on the favorability scale. The participants were then asked to rate their overall impression of the stimulus person. Anderson could then investigate how these global impressions departed from the midpoint of the scale as a function of how the various traits departed from the favorability midpoint. He found that the bad trait adjectives were stronger than the good ones. The mean ratings of stimulus persons defined by all negative traits departed farther from the global scale midpoint than did the mean ratings of stimulus persons defined by all positive traits, even though the traits were equally distant from the midpoint. Furthermore, when stimulus persons were described with both favorable and unfavorable traits, the unfavorable ones lowered the global impression rating more than a simple additive or averaging model would predict, unlike the favorable traits, which did not exert an influence beyond averaging. Anderson concluded that unfavorable trait adjectives were more powerful than favorable ones in shaping impressions.

Another early demonstration was provided by Feldman (1966; see also discussion in Wright, 1991), who was also interested in averaging models. Participants in his study provided ratings of stimulus persons who had been described with one positive, one negative, or one of each type of adjective. The overall ratings of people described by both positive and negative labels were more negative than a simple averaging of impressions would have predicted: Thus, the bad information carried more weight. Wyer and Hinkle (1971) likewise found that bad information carried more weight in impression formation than in good information.

Similar findings were provided by Hodges (1974). Participants in his study rated pairs of traits, and Hodges then calculated whether the combined impression deviated from the average of the two traits. A pure averaging model successfully predicted impressions when only both traits were positive. In all others, the more negative trait carried greater weight. Thus, even when both traits were negative, the total impression was more negative than a simple averaging of the two traits would predict. Of course, when the traits were one of each, the bad one carried more weight. Thus, bad information consistently had a stronger effect on the final impression.

Hamilton and Huffman (1971) also found that undesirable traits received more weight in impression formation than did desirable ones. The authors explained this on the basis of distinctive usefulness of information: Because good behavior is common and expected, bad things are more revealing and hence more important to know. Hamilton and Zanna (1972) found that negative traits exerted a stronger effect than positive traits on impressions, as shown by greater departure from the mean ratings of neutral targets. Moreover, negative traits had a stronger effect than positive traits on participants' confidence in their impressions. That is, raters were more confident of the accuracy of their bad impression of someone with bad traits than they were confident about their good impression of someone with good traits. Taken together, these findings show that bad information has greater power both objectively and subjectively. The objective power is shown in the stronger effect on the impression, and the subjective power is shown in the greater confidence in the accuracy of the impression.

Evidence that negative information carries more weight than positive information in terms of influence on likeability was provided by Fiske (1980). She showed photographs depicting various behaviors that differed in valence (i.e., positive or negative) and extremity. Negative behaviors had more impact on likeability than positive information, especially when the level of extremity was high. The greater power of bad information than good information has continued to be found in recent work (e.g., Vonk, 1993, 1996, 1999; Vonk & Knippenberg, 1994).

The greater power of bad than good information can also be seen in speed of decision making and the amount of information sought. Yzer-

byt and Leyens (1991) had participants make decisions about whether a given actor was suited to play a theatre role that was described as likeable or unlikable. Participants were told how much total information was available about each actor and were given this information a little at a time, so they were free to make a decision as soon as they felt confident enough to do so. The greater impact of negative trait information was shown in speedier decisions (i.e., with less information): A little evidence that the actor was unlikable was enough to discredit him or her for the likeable role. In contrast, a small amount of evidence that an actor was likeable was not enough to disqualify him or her for the unlikable role. (That is, with the unlikable role, the difference was eliminated but not significantly reversed.) When initial information was favorable but unfavorable information followed it (with the likeable role), participants shifted strongly and quickly to rejecting the candidate, which again shows a disproportionately strong impact of bad traits. In general, then, people made faster decisions with less information when they were given negative rather than positive information.

The evidence and theories about the positive–negative asymmetry were reviewed by Skowronski and Carlston (1989). These authors also put forward their own theory, based on category diagnosticity (see also Czapinski, 1986). The basic assumptions of their theory were, first, that people categorize other individuals by using available informational cues. Second, people see some behaviors as more helpful than others in discriminating between various trait categorizations. In other words, some behaviors are more informative than others. For example, the behavior of stealing is more informative about someone's honesty than is the behavior of running. This usefulness of behaviors for making such judgments is what Skowronski and Carlston meant by category diagnosticity. Third, attributes perceived as more diagnostic for category membership will be more influential in impression formation than others. Fourth, and most relevant, extreme or negative behaviors are perceived as more diagnostic than moderate or positive behaviors.

Why should this be so? Skowronski and Carlston (1989) proposed that bad behaviors are more diagnostic than good ones simply because the category requirements of consistency are more stringent for good than bad traits. To be categorized as good, one has to be good all of the time (consistently). To be categorized as bad, a few bad acts are sufficient, and presumably hardly anyone is consistently bad. Hence, negative behaviors carry more weight than positive behaviors for ruling out some categories.

The diagnosticity view was tested in a later paper by Skowronski and Carlston (1992). They noted that to be morally good means to be always good, whereas immorality does not require consistent immorality, so single immoral behaviors are more diagnostic. For example, one may be regarded as a liar despite telling the truth on many occasions, but one will not be regarded as an honest man if he tells many lies. The opposite may apply to intelligence, however, because a stupid person can never be brilliant, whereas a very intelligent person can occasionally do a stupid thing. Skowronski and Carlston did find that the negativity bias held true for moral behaviors but was reversed for intelligence-related behaviors: Extremely positive (intelligent) acts had a bigger effect than extremely negative ones.

The greater power of bad in the sphere of moral behavior was the focus of Riskey and Birnbaum (1974) in an article with the revealing subtitle, "Two Rights Don't Make Up for a Wrong." They found that morally bad actions create a powerful effect on overall judgment, and this effect is only slightly mitigated by adding morally good actions. Riskey and Birnbaum's conclusion was "the overall goodness of a person is determined mostly by his worst bad deed, with good deeds having lesser influence. . . . Given a person has done evil, an infinite number of good deeds may not produce a favorable overall impression" (p. 172). Skowronski and Carlston (1992) found that the impression impact of morally good behaviors was easily overridden by new information depicting immoral behaviors, but the reverse did not hold: An initial impression based on morally bad behaviors was not easily changed by new information about morally good behaviors.

Some researchers have pointed out that in certain domains, positive information should carry more weight. Skowronski and Carlston (1987) contended that diagnosticity helps predict differential weighting of information as a function of whether the judgment pertains to morality or competence. With morality, bad

acts are more diagnostic because only immoral people do bad things, whereas both moral and immoral people do good things. With ability, however, good performances should be more diagnostic than bad ones because only competent people achieve superior performances, whereas both competent and incompetent people can perform badly. Their findings confirmed a negativity bias with moral traits (e.g., dishonest behaviors influenced impressions more than honest ones) but a positivity bias with traits based on competence (e.g., intelligent behaviors had a stronger effect than stupid ones). The dependent variable in these studies was the participant's estimate that the stimulus person would act a certain way in the future, which differs from simply giving a subjective judgment of favorability or likeability. Thus, the results indicate mainly that having performed well (i.e., competently) leads to stronger predictions about future performance than having performed badly, whereas having acted immorally leads to stronger predictions about future performance than having acted morally.

Similar results were reported by Martijn, Spears, van der Pligt, and Jakobs (1992), but with an added twist that they surveyed the net effect of various combinations on overall impressions. The global impression was more affected by bad behaviors than good ones, regardless of whether the information referred to ability or morality. That is, Martijn et al. examined various combinations of traits (e.g., morally incorruptible plus clever, incorruptible plus stupid, corrupt plus clever, and corrupt plus stupid) and assessed overall impressions. All of the combinations, except the double-positive condition, were more negative than a simple averaging model would have predicted. Thus, any bad information carried a disproportionately stronger impact than any good information. Another way of describing their results is that they replicated the diagnosticity effect but also showed that the greater power of bad than good information goes beyond issues of diagnosticity.

Hiring and personnel decisions constitute an especially important sphere of impression formation, and it is one in which situational contingencies probably underscore the greater importance of bad information: It may be more costly to hire a bad, undesirable employee than to reject a good, desirable one. Bolster and Springbett (1961) studied how interviewers' opinions changed as a function of new good or bad information about a candidate. Across a variety of measures and procedures, they found consistently that bad information exerted a more powerful effect than good information. For example, if the initial judgment favored hiring (i.e., acceptance), only 3.8 unfavorable bits of information were required to shift the decision to rejection; whereas 8.8 favorable pieces of information were necessary to shift an initially negative decision toward acceptance. Likewise, Webster (1964) concluded that personnel interviewers use unfavorable information as a basis for rejecting candidates to a greater extent than they use favorable information as a basis for hiring them. Webster suggested that it was more common (and hence presumably required less information) to change from a favorable to an unfavorable impression of a candidate than to change from unfavorable to favorable.

The influence of speaking with positive versus negative words on impressions was studied by Berry, Pennebaker, Mueller, and Hiller (1997). They instructed one set of participants to "tell us about yourself and what is going on in your life," and they videotaped these speeches. The tapes were then shown to other participants, who rated each one on several dimensions. Berry et al. found that people used far more positive than negative emotion words in their self-disclosures (consistent with the view that positive things outnumber bad things), but the negative emotion words had significantly more impact on impressions. Specifically, the more people used negative emotion words, the less warm/likable and the less competent they were judged to be. Positive emotion words had no significant impact on either type of rating and, in fact, on ratings of dominance, positive emotion words actually had a negative effect. Berry et al. speculated that the reason for the discrepancy is that it is acceptable and even expected for people to discuss positive feelings during a first encounter, but speaking about negative feelings is not expected and generates a stronger reaction.

Thus, the greater power of bad than good information in forming impressions has been well documented and recognized by researchers. Multiple theories have been put forward to address this asymmetry, including expectations, memory, and category diagnosticity. Although

these theories can each explain a substantial amount of the findings, the greater power of bad than good information appears to survive even when these explanations do not apply.

Self

Self-concepts should seemingly be one sphere in which bad is not stronger than good. It is well recognized that most people hold rather favorable opinions of themselves. Taylor and Brown (1988) documented a substantial amount of evidence indicating that people think more favorably of themselves than objective evidence warrants (see also Greenwald, 1980). Baumeister, Tice, and Hutton (1989) showed that self-esteem scores on all different scales tend to be distributed from very high to medium, with hardly any participants scoring in the truly low self-esteem range. Other reviews have confirmed that implausibly high majorities of people consider themselves to be above average on various dimensions (see Gilovich, 1991). If bad performances carried greater weight in forming self-concepts, then presumably most people would regard themselves as below average rather than above.

Yet perhaps a direct prediction that people would have unfavorable self-concepts is unrealistic. It is generally agreed that people have strong motivations to maintain favorable concepts of themselves (e.g., Banaji & Prentice, 1994; Baumeister, 1998; Sedikides, 1993). Hence, it is likely that they exert themselves to prevent bad information and bad experiences from producing an unfavorable self-concept. Thus, bad information could actually have greater power than good, without necessarily resulting in a bad self-concept—provided that people's responses to bad experiences or threatening information are capable of discounting any implications about the self. This was a central thrust of Taylor's (1991) paper, which recognized the power of bad feedback but proposed that minimization processes selectively discredit and erase the negative implications for self.

These arguments suggest a way to reformulate the question of whether bad is stronger than good with respect to the self. The strong motivation to have a good rather than a bad opinion of self can be decomposed into two strivings: one of which is to avoid a bad opinion of self (self-protection), and the other is to gain a good opinion of self (self-enhancement). If bad is stronger than good, then the self-protective motivation should be stronger than the self-enhancement one.

Self-concept theory has traditionally placed more emphasis on self-enhancement than on self-protection, such as embodied in the concept of the ideal self (a positive view of self) that is seen as the main motivator. Ogilvie (1987) surveyed psychology students and faculty as to whether life satisfaction depended more on becoming like their ideal selves or becoming unlike their undesired selves, and nearly 90% of both students and faculty said the desire to meet one's positive ideals was stronger. Yet Ogilvie's own data pointed strongly in the opposite direction: The undesired self (operationally defined as "How I hope never to be") was a more powerful motivator than the desired self. General satisfaction in life had significant correlations with both closeness to the ideal self and closeness to the undesired self, but the latter was significantly higher (for ideal self, $r = .368$; for undesired self, $r = -.719$). Regression analyses suggested that the motivation to approach one's ideals might even be derivative of the motivation to avoid becoming one's undesired self. Ogilvie suggested that many people form their ideals precisely in response to their undesired selves. For example, Ogilvie described 1 participant who said his most undesired self was to be dependent, needy, and selfish and who correspondingly erected ideals for himself to be unselfishly helpful to others. "It is likely that his ideal self was derived from his undesired self and not vice versa, and it is suspected that this is the normal course of events" (Ogilvie, 1987, p. 384).

The distinction between protection and enhancement was also made by Baumeister et al. (1989) with regard to individual differences in self-esteem and self-presentational motivations. They concluded that people with low self-esteem are primarily concerned with self-protection, consistent with the view of the greater power of bad events. In contrast, however, Baumeister et al. concluded that people with high self-esteem are oriented toward self-enhancement, which seemingly suggests the opposite motivational pattern (of greater concern with good than bad). Yet the self-enhancement orientation of people with high self-esteem does

not actually indicate an indifference to bad outcomes or failure. If anything, people with high self-esteem show even more dramatic and striking responses to failure than people with low self-esteem (e.g., Baumeister & Tice, 1985; Baumeister, Heatherton, & Tice, 1993; McFarlin & Blascovich, 1981). The difference appears to be that people with high self-esteem do not worry much about failure or rejection because they do not expect these to happen. Their highly favorable expectations account for the surprising discrepancy between seeming disregard of possible future failure and strong and distraught reactions when they actually receive failure feedback (Blaine & Crocker, 1993).

The distribution of self-esteem scores may be relevant. As Baumeister et al. (1989) noted, participants scoring above the median in self-esteem do actually have high self-esteem scores in an absolute sense, so it is plausible that they do not spend much time worrying about possible bad outcomes. In contrast, participants scoring below the median (thus low in self-esteem) typically have scores that are medium in self-esteem, in absolute terms, indicating that they have roughly comparable familiarity with success and failure. Thus, when both success and failure are familiar, bad is stronger than good, and only the people who rarely encounter failure (according to their belief and perception, anyway) disdain self-protection.

A direct test of the relative power of the two motivations was undertaken by Tice (1991). She used the motivated pattern of self-handicapping, a strategic behavior that consists of creating obstacles to one's own performance, such as inadequate practice or alcohol impairment (Jones & Berglas, 1978). In principle, self-handicapping can both enhance success (e.g., succeeding despite minimal practice is doubly impressive) and protect against failure (e.g., failing after inadequate practice is no disgrace). Although Tice's findings confirmed the general hypothesis that low self-esteem people would self-handicap for self-protection while high self-esteem people would do it for self-enhancement, the self-protection pattern was stronger overall. For example, the self-protective benefits of self-handicapping were endorsed by participants at both high and low levels of self-esteem, whereas the self-enhancing benefits were endorsed only by participants with high self-esteem. Put another way, everyone recognizes the value of self-handicapping for protecting against bad outcomes, whereas the value for enhancing good outcomes is confined to people with high self-esteem (who do not worry much about failure anyway). The more widespread appeal of self-protection is consistent with the view that bad is stronger than good.

Likewise, self-serving biases can operate either to protect against bad outcomes or to enhance good ones, but, again, some evidence points to greater power and pervasiveness of self-protection, suggesting that people are more motivated to avoid the bad than to embrace the good. Distortion of information in a self-serving bias was studied by Klein (1992), and he found that biases were stronger in connection with bad than good things. In an initial pair of studies, students were asked to estimate how often they engaged in positive health-related behaviors (e.g., eating fruit, brushing teeth, and eating vitamins) and negative health-related behaviors (e.g., sunbathing, driving in bad weather, and eating salty foods). They also estimated how often their peers performed the same behaviors. There was ample evidence of self-serving bias: On average, students estimated that they performed the good acts more often, and the bad acts less often, than their peers. For present purposes, the relevant point is that Klein found greater bias in connection with the bad than the good behaviors. In fact, in the second study, the bias (i.e., the difference between self and peer estimates) reached significance for the bad behaviors but not for the good ones. In a third study, Klein used the same behavior (eating raisins) and presented it as either a healthful or an unhealthful behavior. When it was presented as health enhancing, because of the high vitamin content of raisins, students claimed to eat more raisins than their peers, but when it was presented as unhealthful, because of a high sulfur content of raisins, students estimated that they ate fewer raisins than their peers. (Control participants, for whom eating raisins was not presented as either healthful or unhealthful, showed no bias either way.) For present purposes, the most relevant finding was that the positive bias was weaker than the negative bias. All these findings point to the conclusion that avoiding the bad is a stronger motivation than embracing the good.

More generally, people seem to show more self-favoring biases for negative than for positive behaviors. Hoorens (1996) reviewed multiple studies showing this pattern, which is to say that people seek to avoid bad traits more than they seek to claim good traits. Hoorens's (1995) earlier work found a contrary pattern, in which participants claimed to possess more good and fewer bad traits than the average person, so the effect is not unanimous, but the contrary findings are often confounded. Thus, Hoorens's (1995) results were confounded by differential base rates: The rates of endorsement of bad traits were relatively low for both self and the average person, so there was relatively little statistical room for the denial of bad traits to emerge.

Personal optimism was also studied by Hoorens (1995) by having participants rate the relative likelihood that various positive and negative events would happen to them, as opposed to being likely to happen to the average person of their same age, sex, and school. The motivational bias fit the view that bad is stronger than good: Hoorens found that personal optimism was more pronounced with regard to bad events than good events. In other words, participants underestimated their own chances of having various bad experiences (relative to the average person) more strongly than they overestimated their chances of having various good experiences.

In performance settings, self-enhancement and self-protection are often indistinguishable. Doing one's best accomplishes both the goal of avoiding failure and securing success. Only a few studies have effectively sought to separate these motivations, but they too confirm that bad is stronger than good. Goodhart (1986) had people engage in either positive or negative thinking prior to an achievement task. These assigned thinking strategies involved recalling oneself being in a situation in which one might have the assigned series of thoughts, such as "Deep down I think I'm a pretty competent person" (positive) or "No matter how hard I try, I just can't seem to grasp certain things" (negative). They were then given an anagrams task. The negative thinking led to better performance on the test. Obviously, this does not reflect any direct self-suggestion or self-fulfilling prophecy (because the results point in the opposite direction). Goodhart concluded that the negative thoughts evoked more powerful motivations than the positive thoughts.

The distinction between self-enhancement and self-protection has been recast by Higgins (1987, 1996) as a distinction between prevention and promotion. In Higgins's view, the self has some goals that involve striving toward positive ideals and others that involve preventing the self from misdeeds, which he discusses in terms of "ought" goals. Direct comparison of these two was recently undertaken by Shah, Higgins, Friedman, and Kruglanski (1999). They found that the positive goals or ideals were more substitutable than the negative or ought goals, which is another way of attesting to the greater importance of the bad. That is, if people refuse to accept a substitute for a particular goal, it seems fair to assume that that goal is more important than another goal for which they will readily accept an alternative. In the study by Shah et al., participants performed two tasks, which were both framed as ideals, both as oughts, or one of each. When both were framed as ideals, then success on one reduced effort on the second, whereas failure on the first led to increased effort on the second—consistent with the view that people believed success on one would substitute for nonsuccess on the other. In contrast, when both were framed as oughts (or when they were mixed), there was no evidence of substitutability, in the sense that there was no effect for feedback on the first task on effort on the second.

A conceptual replication of this pattern was done by Liberman, Chen, and Higgins (1999; cited by Shah et al., 1999). In that study, participants were interrupted and prevented from completing a first task and later given the opportunity to do another task or to resume work on the same task. When both tasks were framed as ideals, they were willing to move to the new task, consistent with a substitutability interpretation. In contrast, when both tasks were oughts, participants wanted only to resume the old task, presumably because the new task was not seen as a substitute. Thus, this line of work suggests that preventing one bad outcome is not an adequate substitute for preventing another bad outcome, whereas reaching one good outcome is often an acceptable substitute for another.

The relative motivational power of good and bad traits can also be examined in indirect tactics. Indirect tactics of self-enhancement and protection were studied by Cialdini and his colleagues. The best known of these is probably that of basking in reflected glory (Cialdini et al.,

1976), by which people link themselves to successful others and successful groups. These studies, however, relied on the procedure of ascertaining how much students identified with their university (such as by wearing school colors) following victories versus defeats by the football team, so it is plausible that the effects were mainly due to efforts to distance oneself from the unsuccessful team (rather than linking oneself to the successful team).

A more rigorous follow-up study was therefore done by Cialdini and Richardson (1980), who explicitly distinguished between "basking and blasting" (p. 406). In that study, *basking* referred to enhancing the positivity of one's own university, whereas *blasting* referred to derogating a rival university, and both tendencies were assessed as responses to personal criticism in the form of failure feedback on a creativity test. Thus, basking invokes the good, whereas blasting invokes the bad. Across two studies, Cialdini and Richardson found the blasting effect to be consistently stronger, and, in fact, the basking effect did not reach significance in either study (unlike the blasting effect). Thus, the tendency to depict one's rival university as bad was stronger than the tendency to describe one's own university as good. The implication is that the motivation to avoid the bad is more powerful than the motivation to embrace the good, which is precisely what one would expect if bad is stronger than good.

Thus, multiple lines of evidence suggest that bad is stronger than good with regard to the self-concept, even though the simple fact of positively inflated self-appraisals might give the opposite impression. The positivity of self-concepts reflects the combined motivational effects of self-protection (avoiding the bad) and self-enhancement (embracing the good). In many cases, such as a simple desire to do well, these two motivations operate in tandem. When they can effectively be separated, though, the weight of the evidence suggests that people are more strongly motivated to avoid bad views of self than to claim good ones.

Feedback

The relative power of good versus bad feedback is yet another sphere in which to test whether bad is generally stronger than good. Some researchers have reviewed, as discussed in preceding sections, work that already points to bad feedback as more potent. For example, some of the data on reacting to daily events are probably mediated by feedback received during events, and the finding that bad days have more lasting impact than good days is probably a sign that bad feedback is stronger. Likewise, the more widespread use of self-handicapping for self-protection than self-enhancement (Tice, 1991) suggests that people are more concerned about avoiding bad feedback than about maximizing good feedback, which points to a greater motivational power of bad feedback.

Self-enhancement and self-protective strategies were studied by Agostinelli, Sherman, Preston, and Chassin (1992). Specifically, these authors examined whether people would respond to feedback by perceiving failure as relatively common and perceiving success as relatively uncommon. Both distortions benefit the self, regardless of whether the self succeeds or fails, because the self's success gains in prestige by being seen as relatively special; whereas the self's failure loses its stigma if many other people fail, too. Participants in their study received success, failure, or no feedback about their performance on a decision-making problem; they were then given measures of how other people would likely do. Biases in judgment were stronger following failure than success (as compared with the no-feedback control): After failure, people rated failure as more common and likely but success as rarer in the general population. Success, in contrast, yielded no departures from the control group. Thus, participants were more affected by bad than good outcomes, and their responses suggested stronger motivations to protect the self against failure than to amplify or enhance the impact of success.

Students' reactions to feedback from teachers were studied by Coleman, Jussim, and Abraham (1987). Bad feedback had a stronger effect on the students' perceptions of their own performance than good feedback. Bad feedback was also seen as more indicative of the teachers' true evaluations, although not surprisingly students regarded the good feedback as more accurate than the bad.

Reactions to social feedback of acceptance and rejection were studied by Leary, Tambor, Terdal, and Downs (1995). Participants were told that they either had been selected by other members to be included in a group or excluded from it or had been randomly assigned to be

included or excluded. Only the intentional rejection led to a change in self-esteem (and a corresponding change in ratings of other participants). Acceptance did not have an effect. In another study, Leary et al. provided participants with specific individual feedback indicating that another person who had listened to their self-disclosures did or did not (a) like them, (b) accept them, or (c) desire to meet them. The rejection feedback resulted in self-esteem scores that were significantly lower than the individuals' own pretest self-esteem, but no feedback and the positive (acceptance) feedback failed to produce any significant change in self-esteem. Thus, bad feedback was clearly stronger because it alone had a significant effect.

The role of counterfactuals in responding to borderline feedback was explored by Medvec and Savitsky (1997). They compared participants who had just barely made it into a desirable grade category (e.g., getting the lowest possible "A") against those who had just barely missed it (e.g., getting the highest possible "B"). Satisfaction was high among participants who had just made the category and low among those who had just missed it, and the borderline status enhanced these reactions. Thus, those who barely missed getting an A were more distraught and engaged in more counterfactuals than those who missed getting an A by a wide margin. For present purposes, the important finding was that the effects of just missing a category were stronger than the effects of just making it. Medvec and Savitsky interpreted this discrepancy in relation to prospect theory (Kahneman & Tversky, 1979), which holds that losses have more impact than comparably sized gains in economic decision making; in other words, bad is stronger than good.

The picture becomes more complicated with regard to memory, because the defensive processes may succeed in suppressing memory for unwelcome feedback. Indeed, Kuiper and Derry (1982) found that participants were less likely to remember bad than good trait words after they had merely been asked whether the words described them, which shows a memory bias against unwelcome views of self even when these were not feedback but merely questions. (Depressed individuals did not have the same bias, however.) Hence, findings of selective forgetting of bad feedback should not be surprising. Mischel, Ebbesen, and Zeiss (1976) found that participants remembered more positive than negative feedback, overall, although the effects were strongest when they either expected success or had had a recent success experience.

As we noted with self, however, the memory trace or net result can be biased in favor of positive feedback, even if bad feedback is stronger, because the bad feedback is processed in a more biased and hostile fashion. Baumeister and Cairns (1992) examined how individuals processed and remembered bad feedback, with special attention paid to repressors (who are most likely to show defensive or self-deceptive responses in the relatively mild context of a laboratory study). Bad feedback elicited clear defensive responses during encoding, and these defenses ranged from avoiding exposure to elaborating it with refutational thoughts. Repressors recalled the good feedback better than the bad feedback overall, although a slight reversal was found among nonrepressors. In this study, moreover, feedback was mixed to varying degrees, so even the good feedback condition contained some bad feedback, and vice versa. The highest memory scores in the entire experiment were obtained among repressors for the small amount of bad feedback embedded in the generally good feedback. (The next highest was nonrepressors in that same condition.) Inconsistency and salience no doubt contributed to these high memory scores, but inconsistency and salience should also have operated to improve memory for small bits of praise embedded in the generally bad feedback; there was not much evidence of this. The explanation is apparently that when feedback is generally good, people let their defenses down, whereupon any small bits of criticism emerge as extremely powerful and are therefore remembered exceptionally well. Put another way, bad is clearly stronger than good when the defenses are down.

Taken together, these studies suggest greater impact and power for bad than good feedback. The main limitation is that defensive responses sometimes succeed in miminizing the long-term impact of bad feedback. When these defenses are not operating, however, bad feedback is stronger than good. Moreover, the greater and more pervasive efforts to minimize bad feedback than to maximize good feedback reflect a motivational asymmetry that also recognizes bad feedback as more important than good.

Health

The importance of physical health makes it a desirable sphere in which to consider the relative importance of good versus bad outcomes. Although we have not found a great deal of evidence, there are some findings that fit the idea that bad is stronger than good.

A review of human psychoneuroimmunology and the biological and environmental factors suggested that bad events have greater impact than good ones (Cohen & Herbert, 1996). Numerous studies have reported the deleterious effects of psychological and physical stress on immune status. For instance, Glaser, Rice, Sheridan, Fertel, and Stout (1987) and Kiecolt-Glaser et al. (1984) have investigated the effects of medical school examinations as a form of psychological stress on the immune functioning of medical school students. Relative to a low-stress time (e.g., immediately after vacation), students' immune systems are significantly compromised by the presence of psychological stress. Psychological stress results in decreased activity of the natural killer cells, which protect the body against disease (Kiecolt-Glaser et al., 1984). Stress also increases the proliferation of lymphocyte production (e.g., Glaser et al., 1987) and heightens the production of herpes viruses antibodies (e.g., Glaser et al., 1987). The effects of negative events such as stress on the body appear to be not only consistent but also swift. In a study of immune cell levels and functioning, Herbert, Cohen, Marsland, Bachen, and Rabin (1994) found weakened immune parameters as soon as 5 min after the induction of the stressor.

Given that stressful events happen to everyone at some point, researchers have sought to assess whether relaxation techniques would yield benefits to physiology comparable to the harm caused by stress. Thus far, the answer appears to be no. There has only been one study to assess immune functioning after a stress-reduction intervention in the presence of a stressful event (Kiecolt-Glaser, Glaser, Strain, Stout, & Tarr, 1986). These researchers found that training medical students in relaxation techniques did not affect the immune changes that occurred as the result of stressful first-year exams. Cohen and Herbert (1996) concluded that there is little evidence for the benefits of stress-reduction techniques on immunological health. In other words, bad events impair the body's protective system, but good events do not boost it.

A different method of reducing stress is to increase social support. However, evidence from controlled studies on the advantageous effects of social support is also limited. One study found that residents in a geriatric home who were visited three times per week by college students showed no change in cellular immune functioning (Kiecolt-Glaser, Glaser, Williger, Stout, & Messick, 1985). In another study, Arnetz, Wasserman, Petrini, Brenner, and Levi (1987) examined the effect of social support on lymphocyte proliferation. Swedish women who had been unemployed for more than 9 months were given both emotional and informational support (e.g., giving them information on getting another job). However, this intervention was not successful in boosting immune functioning.

In contrast, a lack of social support and loneliness have been shown to have a variety of damaging health consequences. Kiecolt-Glaser et al. (1984) found that medical students who reported high levels of loneliness had weaker immune functioning than students who did not report high levels of loneliness. Similarly, psychiatric patients who reported high levels of loneliness also had depressed immune systems.

In summary, various studies and reviews of the immunology literature indicate that bad is stronger than good. In particular, researchers have found that stress and the absence of social support are reliably associated with immunosuppression, whereas their opposites—relaxation and increases in social support—do not seem to have beneficial effects.

Optimism and pessimism were examined by Schulz, Bookwala, Knapp, Scheier, and Williamson (1996) in an effort to predict the mortality of cancer patients. Across 8 months, 70 of the 238 patients in a radiation therapy sample died. Using Scheier and Carver's (1985) Life Orientation Test, Schulz et al. assessed both optimism and pessimism traits. Optimism failed to predict survival, either alone or in interaction with age. Pessimism, however, did yield a significant prediction of mortality, although only for the youngest (30–59) age range. (Thus, the only significant predictor was pessimism interacting with age.) Although the results are correlational, the longitudinal prediction does en-

hance the plausibility that the trait caused the survival outcome rather than vice versa. The implication is that the negative thoughts and feelings associated with pessimism had a stronger effect on mortality outcomes than the positive thoughts and feelings that characterize optimism.

A similar conclusion emerged from a longitudinal study by Robinson-Whelen, Kim, MacCallum, and Kiecolt-Glaser (1997). Pessimism, not optimism, uniquely predicted psychological and physical health outcomes, 1 year later. More precisely, pessimism during Year 3 significantly predicted anxiety, stress, and self-rated health (but not depression) in Year 4. In contrast, optimism during Year 3 did not make a significant contribution to predicting any of the outcomes in Year 4. Although the data are correlational, the longitudinal design makes it likely that the causal relationship went from pessimism to the health outcome rather than the reverse.

A very different approach has been taken by Pennebaker and his colleagues (Francis & Pennebaker, 1992; Greenberg & Stone, 1992; Pennebaker & Beall, 1986; Pennebaker, Kiecolt-Glaser, & Glaser, 1988) in a program of research on how writing about traumatic personal experiences can affect subsequent health. In these studies, participants are typically asked to write about "the most traumatic experience of your entire life," whereas control group participants write about plans for the day, going to college, or minor traumas. People who write about their most traumatic experiences typically show significant improvements in physical health, as compared with the control group, on measures such as visits to the medical centers, immune system function, and sick days. In an attempt to see what aspects of stories might predict (and possibly cause or mediate) these subsequent improvements, Pennebaker (1993) subjected the essays from several previous investigations to linguistic analysis and then checked these against the data on health outcomes. Participants whose essays had contained more words referring to negative, unpleasant emotions showed significantly greater improvement than those who used fewer such words. Use of words referring to positive emotions had, if anything, the opposite effect (and in any case, the effect for positive emotions was weaker). Even those participants who showed the biggest increases in the number of references to positive emotion across the multiple sessions of the study (which seemingly should be a sign of improvement) failed to show a relative improvement in health. Pennebaker concluded that the participants who consistently expressed the most anxiety, sadness, and other negative feelings were the ones who subsequently showed the greatest gains in health.

Thus far we have considered health as a dependent variable, but it can also be considered as an independent variable (although, again, most work remains correlational). The effects of health on happiness and subjective well-being have been studied by several researchers. They believe health has a large impact on happiness (e.g., Diener, 1984), but the actual links tend to be quite weak across the population. One large and thorough study concluded that health is irrelevant to happiness, except for older adults and chronically ill people (Campbell, Converse, & Rodgers, 1976). The exceptions may help explain the seemingly mistaken perception that health is extremely important for happiness. When health is bad, it does have a major impact on happiness, but variations in good health have small or negligible effects. Put another way, the difference between being moderately sick and very sick is relatively powerful, whereas the corresponding difference between being moderately well and very well has little impact, so health mainly affects happiness when health is bad. Thus, health too conforms to the pattern in which bad is stronger than good.

General Discussion

The principle that bad is stronger than good appears to be consistently supported across a broad range of psychological phenomena. The quantity and strength of the evidence were not consistent and in fact varied widely from one topic to another. The breadth and convergence of evidence, however, across different areas were striking, which forms the most important evidence. In no area were we able to find a consistent reversal, such that one could draw a firm conclusion that good is stronger than bad. This failure to find any substantial contrary patterns occurred despite our own wishes and efforts. We had hoped to identify several contrary patterns, which would have permitted us to develop an elaborate, complex, and nuanced the-

ory about when bad is stronger versus when good is stronger. The most we can say is that occasionally other psychological patterns will override the greater strength of bad things, and the greater strength of bad varies with respect to size, amount of evidence, and methodological strength of evidence. However, the greater strength of bad was apparent nearly everywhere. Hence, we must conclude that bad is stronger than good at a pervasive, general level.

Let us briefly summarize the evidence. In everyday life, bad events have stronger and more lasting consequences than comparable good events. Close relationships are more deeply and conclusively affected by destructive actions than by constructive ones, by negative communications than positive ones, and by conflict than harmony. Additionally, these effects extend to marital satisfaction and even to the relationship's survival (vs. breakup or divorce). Even outside of close relationships, unfriendly or conflictual interactions are seen as stronger and have bigger effects than friendly, harmonious ones. Bad moods and negative emotions have stronger effects than good ones on cognitive processing, and the bulk of affect regulation efforts is directed at escaping from bad moods (e.g., as opposed to entering or prolonging good moods). That suggests that people's desire to get out of a bad mood is stronger than their desire to get into a good one. The preponderance of words for bad emotions, contrasted with the greater frequency of good emotions, suggests that bad emotions have more power. Some patterns of learning suggest that bad things are more quickly and effectively learned than corresponding good things. The lack of a positive counterpart to the concept of trauma is itself a sign that single bad events often have effects that are much more lasting and important than any results of single good events. Bad parenting can be stronger than genetic influences; good parenting is not. Research on social support has repeatedly found that negative, conflictual behaviors in one's social network have stronger effects than positive, supportive behaviors. Bad things receive more attention and more thorough cognitive processing than good things. When people first learn about one another, bad information has a significantly stronger impact on the total impression than any comparable good information. The self appears to be more strongly motivated to avoid the bad than to embrace the good. Bad stereotypes and reputations are easier to acquire, and harder to shed, than good ones. Bad feedback has stronger effects than good feedback. Bad health has a greater impact on happiness than good health, and health itself is more affected by pessimism (the presence or absence of a negative outlook) than optimism (the presence or absence of a positive outlook).

Convergence is also provided by Rozin and Royzman (in press). Quite independently of this project, these authors reviewed the literature on interactions between good and bad, and they too concluded that bad things generally prevail. Our review has emphasized independent, parallel effects of good and bad factors, whereas theirs emphasized good and bad factors competing directly against each other in the same situation (such as contagion). Both approaches have confirmed the greater power of bad factors.

Thus, the greater impact of bad than good is extremely pervasive. It is found in both cognition and motivation; in both inner, intrapsychic processes and in interpersonal ones; in connection with decisions about the future and to a limited extent with memories of the past; and in animal learning, complex human information processing, and emotional responses.

Searching for Exceptions

Given the scope and variety of the evidence, the appropriate question to ask is not whether bad is generally stronger than good but rather, how general or universal is this pattern? When we began this review, we anticipated finding some exceptions that would demarcate the limits of the phenomenon. Although a few isolated studies have deviated from the general pattern, we were unable to locate any significant spheres in which good was consistently stronger than bad. At most, the greater power of bad can occasionally be overridden, such as when positive information is made to be more diagnostic than negative information (Skowronski & Carlston, 1989, 1992)—but even in this instance, the greater power of bad than good can be found lurking in the background (Martijn et al., 1992).

The closest to a general reversal was in anticipation of future events, insofar as prevailing optimism about the future reflects a greater power of good future events (e.g., Weinstein, 1980). Even this pattern, however, did not con-

stitute a reliable exception. When people are making decisions about specific, impending events, they seem more motivated to avoid bad outcomes than to pursue good ones, at least in many cases in which the magnitude of the two outcomes has been carefully calibrated to be the same (as the gambling studies showed).

A related pattern showing a preference for good is the so-called "pollyanna hypothesis," which suggests that people are biased toward more positive ideas and conclusions. Boucher and Osgood (1969) observed that "there is a universal human tendency to use evaluatively positive (E+) words more frequently . . . than evaluatively negative words (E–)" (p. 1). Similarly, Matlin and Stang (1978) observed that negative words consist more often of a positive root that becomes negative by a prefix (e.g., *un*pleasant) than the reverse. Likewise, when people are instructed to attribute traits to a target person, they tend to assign more positive than negative ones, with approximate proportions of 62% positive and 38% negative (e.g., Adams-Webber, 1977; Benjafield, 1984; Benjafield & Adams-Webber, 1976; Tuohy & Stradling, 1987). Still, such findings are not really contrary evidence, and, in fact, they may help perpetuate the greater power of bad by keeping it in the minority so that it remains more salient (e.g., Berlyne, 1971). One could also suggest that the preference for positive words and positive traits makes the greater power of bad ones especially remarkable because it must overcome bias. Our view is simply that the greater frequency of good is the natural complement to the greater power of bad: Good can only match or overcome bad by strength of numbers.

The memory literature also yielded several findings demonstrating a reversal of the bad is stronger than good pattern. This reversal appears to be driven by two distinct processes: a *self-enhancement effect* whereby negative memories were suppressed or positive memories accessed, and a *mood congruency* whereby nondepressed individuals (the majority) showed a tendency for recalling information that was positively valenced and thus matched their current mood. At least in memory, the bad is stronger than good effect will at times take a back seat to other psychological principles. Still, the occasional finding of greater recall for positive experiences probably reflects a selective and motivated process by which bad memories are suppressed, so it does not really indicate that the bad experiences had lesser power. The very emergence of processes designed to suppress unpleasant memories can be regarded as a testimonial to the power of bad experiences.

There was also some evidence that positive and negative events have differential effects on memory. Some researchers have found that people remember pleasant events better than unpleasant events (e.g., Brewer, 1988; Holmes, 1970). However, we found as many or more studies indicating that negative events leave a longer and more lasting mark on memory (e.g., Banaji & Hardin, 1994; Skowronski & Carlston, 1987; see the *Memory* section in this article). Although our search did yield some mixed evidence on the effects of bad versus good on memory, the overall consensus was that, at least in the short term, bad has a greater impact on memory (e.g., Bless et al., 1992; Dreben et al., 1979); with time, it seems that there exist cognitive operations to reduce the longevity of this effect (e.g., Walker et al., 1997).

There are individual differences in the degree to which people are oriented toward good versus bad. Nondepressed people seem to seek out positive information and avoid negative information more than depressed ones, as noted in several spheres. These include optimism regarding the future (Taylor & Brown, 1988) and biased recall for positive information (Matt et al., 1992). There are also repressors who systematically ignore negative information about the self (e.g., Baumeister & Cairns, 1992). Likewise, there are well-established individual differences in general tendencies toward approach and avoidance motivation (Elliot & Covington, 2001) that may be linked to the relative response to bad and good stimuli. These exceptions seem, however, to reflect preference for good over bad rather than subjective impact, and many of those individuals are actually strongly affected by bad events when they do confront them. The individuals for whom good is actually stronger than bad constitute a small and atypical minority.

Another factor to consider is the possibility that overall bad outweighs good (i.e., there is a main effect for bad vs. good) but that the type of outcome may moderate the strength of the effect. That is, if the dependent measures are broken down into negative (e.g., judging how clumsy a target is) versus positive (e.g., judging

how graceful a target is), the bad and good will affect the positive measures, but only the bad will affect the negative measures. Although numerous studies in this review (e.g., Major et al., 1997) showed this pattern, it was not consistent enough for us to pronounce this a true boundary condition. However, the idea is intriguing and suggests directions for future research. For instance, in attempts to use a manipulation that produces the strongest effects, researchers would be wise to use something bad so as to influence both positive and negative outcomes.

The general lack of reliable counterexamples has made it difficult to specify boundary conditions on the general rule that bad is stronger than good. Indeed, when reviewing the evidence, we had hoped to find more exceptions, reversals, moderator variables, and boundary conditions. The presence of these factors would have made for a more sophisticated and nuanced theory as to why bad would be stronger than good. Accordingly, the lack of these variables renders it somewhat difficult to formulate a theory that can account for such broad and consistent findings. The safest conclusion, then, is that the bad is stronger than good effect is a robust and broad-level psychological principle that underlies a range of psychological phenomenon and operates in the company of a limited number of similarly broad principles.

Revisiting Theory

We began this article by briefly suggesting that the relative strength of bad over good is an adaptive response of the human organism to its physical and social environment. In view of how pervasive the relative strength of bad is, it seems unlikely that this pattern is maladaptive. In particular, we found that bad was stronger than good with regard to health, social support, and learning—all of which are important spheres for adaptations. It seems especially unlikely that maladaptive patterns would have remained powerful there. We also noted that people for whom good is stronger than bad (e.g., people insensitive to pain or to guilt) seem prone to misfortunes and early deaths; this too is consistent with the view that it is adaptive for bad events to have greater power. We turn now to the question of why bad would be stronger than good across such diverse areas and with such reliability.

Is it adaptive? At the broadest level, we argue that bad is stronger than good because responding to the world in this way is adaptive.

Generally, individuals who are attuned to preventing and rectifying bad things should flourish and thrive more than individuals oriented primarily toward maximizing good things. This argument is admittedly speculative.

The broadest argument we can devise is based on a change in motivational states in the presence of negative events, stimuli, and information. When considering why bad outweighs good, an intriguing possibility is that bad things indicate a need for the self to change something about itself; that is, that bad things prompt self-regulation. Through self-regulation, an organism can adapt and change itself to fit its environment, a strategy that is adaptive, given that the organisms most likely to reproduce are those that can be flexible in the face of ever-changing circumstances. Rigid adherence to behavioral patterns that were useful in the past is not effective when met with new challenges and threats. Thus, one of the best methods of increasing survival and gene transmission is to be closely attuned to the current environmental contingencies. Moreover, changing the environment to fit the self is neither effective nor practical as a route to maximize evolutionary fitness.

A related argument is that progress may be best facilitated by having bad events have a lasting impact while good events have a temporary one. This too is based on the idea that bad events signal a need for change, whereas good ones do not. If satisfaction and pleasure were permanent, there might be little incentive to continue seeking further benefits or advances. The ephemeral nature of good feelings may therefore stimulate progress (which is adaptive). If bad feelings wore off, however, people might repeat their mistakes, so genuine progress would best be served by having the effects of bad events linger for a relatively long time.

Organisms require not only a system to signal the need for change, but also one that communicates quickly and intensely, with little energy or effort required and without awareness, because the necessary change may require swift responding. Empirical findings have demonstrated that bad things satisfy these criteria. Research confirms that negative stimuli have greater influence on neural responses than positive stimuli (Ito, Larsen, Smith, & Cacioppo,

1998); that negative traits, relative to positive traits, have greater influence on the overall impression of another person (Peeters & Czapinski, 1990); and that negative trait adjectives command more attention, at a nonconscious level, than positive trait adjectives (Pratto & John, 1991).

In summary, it may be that humans and animals show heightened awareness of and responded more quickly to negative information because it signals a need for change. Hence, the adaptiveness of self-regulation partly lies in the organism's ability to detect when response modifications are necessary and when they are unnecessary. Moreover, the lessons learned from bad events should ideally be retained permanently so that the same dangers or costs are not encountered repeatedly. Meanwhile, good events (such as those that provide a feeling of satisfaction and contentment) should ideally wear off so that the organism is motivated to continue searching for more and better outcomes. As a result, organisms that possess mechanisms for adept perception and processing of negative cues will achieve greater fitness with the environment and, consequently, will have a greater chance of surviving threats and more successful reproductive attempts.

A related argument might be made on the basis of social (and biological) systems. In order for a system to function effectively, each component of the system must do its part. If one component breaks down, the entire system can be disrupted. Hence, at the level of the individual on the system, bad is undeniably stronger than good. Any individual part can prevent the system from functioning; but no individual part can by itself cause the system to succeed. This is especially true of social groups (or at least those marked by division of labor): Water must be found, food must be obtained and distributed, predators must be kept away, and enemies must be intimidated or defeated. No one of those successes can ensure the group's survival, but failure in any of those spheres can ensure its demise. Biological systems have similar properties, and if even one vital organ ceases to function (heart, lungs, brain, stomach), the person will die. This concept was proposed under the name of the *chain principle* by Weinberg (1975; Peeters & Czapinski, 1990). A chain's efficacy depends on its weakest link, and weakening any one link weakens the entire chain; whereas strengthening any one link (other than the weakest) or adding stronger links will have minimal effect on the chain's overall strength.

A final consideration is that bad has greater power because good entails consistency across time and events, which cannot be created by a single good event but can be destroyed by a single bad one (see Rozin & Royzman, in press). The importance of stability with regard to good things may well have contributed to evolving a broad orientation to respond more strongly to bad than good. In a crucial sense, the stability argument is linked to the asymmetry of life and death: The individual remains alive after several years only if he or she managed to survive every single day, and no degree of optimal experience on any given day can offset the effects of failing to survive on another. Individuals who failed to emphasize the consistency and stability of good outcomes might well have taken more extreme risks in pursuit of powerfully good outcomes and hence failed to survive and reproduce. In this way, natural selection would have shaped the human organism to give high priority to consistency and stability, which in turn would foster the basic orientation that bad is stronger than good.

In summary, the propensity to experience bad as stronger than good may confer a significant adaptive advantage for individuals, such that those who mobilized their attention and resources toward the bad would be more likely to survive and reproduce. To see how life would be lived if bad were not stronger than good, we can look to the rare individuals who are born with a congenital insensitivity to pain. These individuals do experience pleasurable physical sensations to a relatively greater extent and intensity than negative ones. Yet they tend to die from physical mishaps stemming from their inability to feel pain, with children reportedly biting off their fingers or tongues and suffering severe burns from contact with hot surfaces and adults having to find substitute signals for pain. For example, one sufferer was reported to not feel a ruptured appendix and therefore failed to seek treatment in time; another suffered severe spinal deformations as a result of neglecting proper posture (Sternbach, 1968). Thus, as humans, we are well served by having bad stronger than good, on both a personal level and an evolutionary level.

Insights from prior theory. Researchers concerned with impression formation have already debated some of these theoretical issues because their area is the main one in which the predominant strength of the bad side has been recognized (also known as the *positive–negative asymmetry*). Kellermann (1984) examined the greater power of negativity in initial interactions. She managed to articulate six different theories: the first three were based on the greater frequency of good than bad information, which makes bad information more salient and perhaps more powerful in other ways. As Kellermann noted, however, salience does not really provide a full and satisfactory explanation, particularly for laboratory experiments in which positive information is made equally salient. One might, however, revive this theory by proposing, at the broadest level, that life as a whole has more good than bad events, such that bad events will inevitably stand out (even if on a local basis, such as in a given laboratory experiment, their frequency is made comparable to good events). One might even suggest that the lives of American and Western European citizens (from whom the majority of data are collected) are exceptional in the disproportionately high frequency of good events, and that if researchers were to study people who live in harsh, desperate times, individual good events would be relatively rare and might therefore have greater power by virtue of this salience.

Another theory was that negative information is actually more informative, insofar as it departs more from what is normative: People are supposed to behave well, and so bad acts defy social and situational pressures and hence are presumably more revealing about the inner dispositions of the actors (and therefore more likely to promote correspondent inferences; see Jones & Davis, 1965). Extremity of information (Fiske, 1980) is also relevant because extremely positive information can also be quite informative, so the informativeness hypothesis is a variation on the correspondent-inference theory. Kellermann's (1984) review leaned toward favoring the view that bad information is more informative (based on extremity and distance from the average or norm). Skowronski and Carlston (1989) likewise favored the view that bad events carry more weight in forming impressions because they are more diagnostic of the traits and dispositions of individuals. Even if this assessment is correct, however, it is confined to the sphere of forming impressions of newly met acquaintances, so something additional would be needed if there is indeed a more general pattern in which bad is stronger than good.

Working from a perception background, Wright (1991) has proposed a "fundamental negative bias" (p. 471) in which perception will be guided more by negative than positive events. She also proposed that this negativity will carry over into the thoughts and feelings following the initial perception. Furthermore, she proposed that these effects are likely to be strongest to the extent that the stimulus is salient and the context is vague or sparse. A rich context may mitigate the effect of the stimulus, whereas salience should enhance it. We note, however, that if bad is indeed stronger than good, then it is plausible that a mitigating context might nullify the effects of good, positive information even more thoroughly than the effects of bad, negative information. In this sense, the logic behind Wright's proposition is not entirely persuasive. Then again, Wright might simply have meant that the differential impact of negative information may be clearest when all effects are strongest, which means in the absence of mitigating context.

Wright's (1991) account is thus again at best a partial explanation. If perception has a fundamental negative bias, then most other psychological phenomena will show the same asymmetry to the extent that they depend on perception. The perceptual asymmetry, however, requires explaining itself, so again we are left searching for a more comprehensive explanation.

The same problem is found in Maslow's (1968) motivational theories. Although he did not explicitly speak of the superior power of bad over good, he did propose that the most basic and primary motivations involve escaping from aversive states, such as hunger, deprivation, cold, and danger. The more positive motivations of seeking esteem, love, belongingness, and self-actualization only begin to direct behavior when the negative or *deficiency* (his term) motives have been satisfied. As with Wright's (1991) perception-based theory, Maslow's motivation-based theory can effectively explain why affect, cognition, and behavior give precedence to escaping the bad, insofar as these responses depend on motivation. How-

ever, the reason for the motivational asymmetry is simply postulated rather than explained. In our view, these patterns point back toward evolutionary selection. We have suggested that survival and reproduction (in K-selected species) depend on giving priority to avoiding bad rather than pursuing good. If this argument is broadly correct, it would hardly be surprising that the basic phenomena of perception and motivation would already show signs of this bias.

A more sophisticated theoretical formulation by Taylor (1991) is also relevant. Indeed, in her article, she devoted some space to documenting the greater power of negative than positive events. Taylor proposed that aversive events produce complex cognitive and affective reactions that good, desirable events do not because the bad events present problems that require solving. One can thus ignore something good more easily than something bad. In Taylor's account, bad events set off two relevant sets of responses: the first mobilizes resources to meet the threat, and the second tries to minimize the damage or trauma afterward. In contrast, pleasant events can be quietly and passively enjoyed without either the mobilization or the minimization.

Taylor's (1991) theory addresses a different problem than the one with which we are concerned. The mobilization and minimization patterns she delineated could be entirely correct even if good were stronger than bad. The extra cognitive and affective work involved in responding to bad events (as opposed to good ones) would contribute something to the greater psychological impact of bad events, insofar as more effort may be required and more extensive processing may leave clearer psychological traces (e.g., improving memory). Then again, to the extent that the minimization process is successful, the long-term impact of bad events may turn out to be less than the impact of good events: People do not minimize good events, so these may live on even as the psyche attempts to purge its memory of prior woes and misfortunes.

A motivational account of the differential effects of bad versus good has been proposed by Cacioppo and colleagues (e.g., Cacioppo & Berntson, 1994; Cacioppo, Gardner, & Berntson, 1997). They proposed a *negativity bias* in their model of evaluative space, such that comparable degrees of activation have greater effects on the negative, as opposed to positive, motivational system. Accordingly, there is a steeper slope for the relationship between the activation and motivational response for negative stimuli. Several investigations have confirmed this negativity bias (Bradley, Lang, & Cuthbert, 1997; Cacioppo & Berntson, 1994; Ito et al., 1998).

In summary, it is apparent that prior work has contributed an important set of mid-level theories about the relative power of good versus bad events. Taken alone, these formulations and insights do not provide a full accounting for why bad should be stronger than good as a general psychological principle. The most sophisticated theories about the asymmetry in impression formation appear to zero in on diagnosticity and correspondence of inferences, which are specific to impression formation and could not easily apply, say, to taste aversion learning or trauma. We found that bad was stronger than good in a remarkably broad and diverse set of phenomena. A specific or mid-level theory may not be broad enough to account for it. Instead, it appears to be a basic, pervasive fact of psychology that bad is stronger than good.

Implications

The role of culture. Our review focused exclusively on the individual's experience of bad and good and concluded that experiencing bad as stronger than good is adaptive to the individual. In other words, nature may have shaped the human psyche to treat bad as stronger than good. Culture, however, would not necessarily have to conform to this. In fact, if one considers the myths and ideals that cultures present, there does not seem to be any clear message that bad is stronger.

For example, religion is widely regarded as a supremely cultural phenomenon. In recent millennia, religious ideas have emphasized salvation as much as retribution (e.g., Eliade, 1982, 1985). Heaven and hell are equally extreme in the Christian tradition, and there seems little basis for assuming that hell is in any sense more powerful or extreme than heaven. Indeed, in most modern nations, belief in hell is significantly less widespread than belief in heaven (e.g., Aries, 1981), which might be construed as indicating that the cultural ideas emphasize good more strongly than bad.

Love has likewise received idealization in cultural mythology that has made of it a more extreme good than is empirically justified. Songs, films, novels, and wedding vows continue to promise that love is forever, even though the statistics on divorce, marriage therapy, and infidelity indicate that it is not. In fact, Baumeister (1991) concluded that cultural ideals of fulfillment have a general pattern of promising more permanence than is typically found, whether these fulfillments involve love, happiness, spiritual enlightenment, fame and celebrity, wealth, creativity, or others.

Thus, culture certainly presents individuals with mythical images of extreme possibilities in both directions. Probably the reason for this is that these cultural myths are important means by which a society can motivate its individuals to behave in socially desirable ways, and mitigating the extremity of the myth would simply weaken the motivations. In particular, culture may find it optimal to encourage people to delay gratification over periods that are far longer than what prevailed in our evolutionary history. As just one example, the multiyear process of attending college or graduate school is probably best sustained by a positive image of how wonderful life will be afterward, whereas nature has few contingencies that require one to adopt such a long-range time perspective.

Happiness. We have concluded that bad is stronger than good, yet a wealth of data suggest that life is good and people are largely happy (D. G. Myers, 1992). How can good overcome the greater power of bad to make life seemingly so wonderful? There are several answers.

Good can overcome bad by force of numbers. To maximize the power of good, these numbers must be increased. This can be done by creating more goods. For example, in a romantic relationship each partner can make an effort to be nice to the other consistently. Such small acts of kindness are important for combating the bads that will typically occur. Indeed, if Gottman (1994) is correct, the ratio should be at least five goods for every bad. Likewise, individuals can make an effort to recognize and appreciate the goods that they have—celebrating each small success, being thankful for health, and having gratitude for supportive others.

Another contributor to the perception of life as good involves selective perception and memory. As Taylor (1991) argued, the human psyche has powerful mechanisms for retrospectively minimizing bad experiences. Although both good and bad feelings may fade with time, the bad ones are actively suppressed; whereas the good memories may be cultivated and sustained (e.g., through reminiscence). By the same token, people may treat bad experiences as isolated events while integrating good ones into an ongoing general perception of goodness. In this way, individuals may sustain a broadly favorable view of their lives. Something like this must after all be operating in most marriages, given that most people rate their marriages favorably, but half of marriages end in divorce. Probably they rate their marriage favorably (by regarding the problems as temporary or exceptions) until they begin to contemplate divorce seriously.

These considerations are quite consistent with the view that the good life consists of a consistent pattern of good outcomes, even if these are individually relatively small and weak. A few bad outcomes can be minimized by making external attributions or regarding them as unimportant, thereby preserving the subjective impression of a stable pattern of good outcomes. As long as the individual perceives that pattern of consistent goodness, life may seem strongly good overall even if nothing strongly good ever happens.

Learning and child development. We have also noted that certain areas are characterized by a belief in the superior power of good. These areas include learning and child development. We presented research earlier to suggest that such beliefs are mistaken. Specifically, punishment produces faster learning than reward, and bad parenting has a stronger effect than good parenting. Still, it is possible that some genuine exceptions can be found in these areas. On the other hand, it may be that ethical and practical concerns are mainly responsible for the advocacy of reward instead of punishment. Any seeming disadvantage of punishment (as compared with reward) in promoting learning may arise because punishment has side effects that interfere with effective learning, so punishment may be quite strong in general. Ethical and political concerns may make people reluctant to hit their children, and those individuals who do hit may sometimes encounter resentments and other long-term problems, but these concerns do not prove that punishment is itself weak. In

other words, punishment may not be optimal for education, even if it does produce optimal learning, because the side effects of punishment can be damaging.

The question about punishment and learning raises a broader issue. To examine whether reward or punishment promotes better learning is to look for only one kind of effect—in particular, a good one (insofar as learning is good). In a number of the studies we have reviewed here, researchers found that positive independent variables affected positive dependent variables, whereas negative independent variables affected negative dependent variables—although often the negative independent variables also affected the positive dependent variables. Put more simply, good affects good, whereas bad affects both bad and good. If one were to look only at good outcomes, however, one might well often find that good and bad events have roughly equal impact, and sometimes the good events will show up as stronger. This would, however, be a misleading conclusion caused by the one-sided focus on good outcomes. Only when the range of outcomes includes both good and bad ones, such as illness versus health, or a happy marriage versus a divorce, or liking versus disliking, can one claim to have provided a full and balanced assessment of the relative power of good and bad causes.

Concluding Remarks

In our review, we have found bad to be stronger than good in a disappointingly relentless pattern. We hope that this article may stimulate researchers to search for and identify exceptions; that is, spheres or circumstances in which good events outweigh bad ones. Given the large number of patterns in which bad outweighs good, however, any reversals are likely to remain as mere exceptions. The lack of exceptions suggests how basic and powerful is the greater power of bad. In our view, this difference may be one of the most basic and far-reaching psychological principles.

Although it may seem pessimistic to conclude that bad is stronger than good, we do not think that such pessimism is warranted. As we have suggested, there are several reasons to think that it may be highly adaptive for human beings to respond more strongly to bad than good. In the final analysis, then, the greater power of bad may itself be a good thing. Moreover, good can still triumph in the end by force of numbers. Even though a bad event may have a stronger impact than a comparable good event, many lives can be happy by virtue of having far more good than bad events.

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