

15

TURNING ADVERSITY TO ADVANTAGE: ON THE VIRTUES OF THE COACTIVATION OF POSITIVE AND NEGATIVE EMOTIONS

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Although health psychology has long been concerned with the interplay of emotions and health, research has overwhelmingly focused on negative, rather than positive, emotions. Why the preoccupation with the negative? Negative, compared to positive, emotions have a larger impact on affective judgments (Ito, Cacioppo, & Lang, 1998), beliefs and behavior (Cacioppo, Gardner, & Berntson, 1997; Skowronski & Carlston, 1989; Taylor, 1991), the viscera (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000), and even event-related potentials (Ito, Larsen, Smith, & Cacioppo, 1998). Given the traditional conceptualization of the substrates underlying positive and negative emotions as falling at opposite ends of a single bipolar affective mechanism (e.g., see Russell & Carroll, 1999), health psychology's

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focus on potent and disruptive negative emotional processes to the relative exclusion of positive emotional processes made much sense. It followed from the assumed reciprocity of positive and negative hedonic processes that reducing negative feelings was equivalent to increasing positive feelings. Thus, what was learned from the study of negative emotional processes was thought to transfer directly and completely to positive emotional processes (but see Ito & Cacioppo, 1999).

Given this theoretical context, it is understandable that the vast majority of research on health and emotion has studied the impact of negative emotional experiences on disease processes. Such studies have in fact outnumbered those investigating positive, health-promoting factors by 11 to 1 (Mayne, 1999). A long-standing area of interest has focused on the impact of psychological stress on cardiovascular activity (e.g., Tomaka, Blascovich, Kibler, & Ernst, 1997), neuroendocrine response (e.g., Cacioppo et al., 1995), and immune function (Glaser, Pearl, Kiecolt-Glaser, & Malarkey, 1994), as well as on mental (Folkman, Lazarus, Gruen, & DeLongis, 1986) and physical health (Cohen, Tyrrell, & Smith, 1991). A second major area of research has focused on the effects on physical health of such negative emotions as depression, anxiety, loneliness, hostility, and anger, as well as on emotional personality traits such as neuroticism (e.g., Friedman & Booth-Kewley, 1987). These areas of study have been productive in identifying negative emotional factors that act as health risk factors and in developing models explicating how such factors may contribute to disease outcomes. Given that negative emotions do affect health outcomes, it is likewise understandable that these lines of research have treated negative emotions as something to be avoided or at least diminished, rather than dwelled on.

Nevertheless, recent theoretical developments in the areas of emotions and affective neuroscience call into question the long-standing assumption that the processes underlying positive and negative affect are identical. Elsewhere, we have suggested that the characteristics of the affect system differ across the levels of the nervous system as a function of the unique constraints acting on each level (Cacioppo, Gardner, & Berntson, 1999; Ito & Cacioppo, 1999). Although physical limitations constrain behavioral expressions and incline behavioral predispositions toward a bipolar organization (e.g., good vs. bad; approach vs. withdraw), a central tenet of our evaluative space model (ESM; Cacioppo & Berntson, 1994, 1999; Larsen, McGraw, & Cacioppo, 2001) is that these limiting conditions may lose their power at the level of underlying mechanisms. Activation of positivity (appetition) may therefore be partially distinct and separate from activation of negativity (aversion) at the earliest stages of evaluative processes, even though these processes typically result in bipolar evaluative responses.

The ESM has two important implications here. First, the ESM raises

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the possibility that reducing negative feelings may not be equivalent to enhancing positive feelings. Accordingly, what has been learned from the study of negative emotional processes may not transfer completely to positive emotional processes. As such, the study of linkages between positive emotions and health may be expected to yield associations, mechanisms, and successful interventions that the exclusive study of negative emotions would fail to reveal. The various chapters in this book are testimony to this point.

Second, by conceptualizing the affect system within a bivariate space rather than a bipolar continuum, the ESM allows several modes of evaluative activation, each possessing distinct antecedents, processing properties, and consequences (Cacioppo & Berntson, 1994, Table 1). Bipolar conceptualizations assume that stimuli affect positivity and negativity in opposite directions, such that increases in one system are accompanied by decreases in the other. A bivariate conceptualization allows for such reciprocal activation as well as additional modes of activation. Uncoupled activation occurs when stimuli affect positivity or negativity, but not both. Stimuli may also affect positivity and negativity in the same direction. Coinhibition occurs when a stimulus reduces activation of both systems. Similarly, coactivation occurs when a stimulus increases activation of both systems.

The ambivalence associated with coactivation provides indeterminate behavioral guidance and is therefore presumed to be unstable and unpleasant (Cacioppo & Berntson, 1994, 1999). The thesis of this chapter, however, is that this discomfitting mode of coactivation may allow individuals to make sense of stressors, to gain mastery over future stressors, and to transcend traumatic experiences. That is, coactivation may allow individuals to transform adversity to advantage. More generally, we will point out that the traditional focus on the negative aspects of health and well-being (e.g., Cannon, 1929), as well as the more contemporary focus on the positive aspects (e.g., Ryff & Singer, 1998), need to be complemented by a consideration of the conditions for and consequences of the several modes of evaluative activation.

PRIOR RESEARCH ON THE EFFECTS OF EMOTIONAL REACTIONS TO STRESSORS ON HEALTH

Psychological stress has been known to have negative effects on health since the work of Cannon (1929) and Selye (1956). Contemporary research suggests that negative emotional reactions to stressors can also be detrimental to health, but that emotion management can foster healthy coping (Lazarus & Folkman, 1984). Those who ignore the occasional aggressive driver on the morning commute, for example, avoid the negative

health outcomes often associated with perseverating on daily hassles. But not all stressors are small. Given that extreme, persistent negative events cannot always be ignored, effective coping may require acceptance of the stressor and the negative emotions it evokes. In other words, individuals facing severe traumas must grapple and come to grips with the negative event.

A number of investigations have examined the role of emotional reactions to stressors in healthy coping in the context of the disclosure paradigm. In the disclosure paradigm (e.g., Pennebaker, 1993), participants are asked to write several brief daily essays on their thoughts and feelings about a stressor. A typical finding is that experimental participants subsequently show better health outcomes than control participants who write about nonstressful topics. Importantly, disclosure participants typically express both positive and negative emotional reactions to the stressor in such studies. King and Miner (2000), for instance, found that participants given the standard disclosure instructions used just as many positive and negative words in their essays as those explicitly instructed to focus on the traumatic and beneficial aspects of the stressful event. Work by Spiegel and colleagues (Spiegel, Bloom, Kraemer, & Gottheil, 1989) further shows that individuals who express little or no emotion when faced with dire stressors typically suffer worse health outcomes than individuals who are more emotionally expressive.

These studies were important in calling into question the focus on reducing the negative emotions felt by individuals in periods of dire stress. In one of the initial disclosure studies, Pennebaker, Kiecolt-Glaser, and Glaser (1988) asked participants to write about severe, personally relevant traumas. Pennebaker (1993) later found that those participants in the Pennebaker et al. study who subsequently showed improved health outcomes (e.g., fewer trips to the student health center, superior immune function) used more negative emotion words in their essays (e.g., *sad*, *angry*; $M = 3.0$) than did those who showed no improvement ($M = 2.7$). Moreover, those who improved also used fewer positive emotion words (e.g., *happy*, *joy*; $M = 2.5$) than those who did not improve ($M = 3.1$).

What was not clear from this study was whether it was the increased negativity, decreased positivity, or some optimal balance of the two (i.e., coactivation) that was fundamentally related to the subsequent improvements in health outcomes. Interestingly, subsequent studies examining the relationship between disclosure of positive and negative emotions have not consistently replicated Pennebaker's (1993) initial findings. In one study, Pennebaker and Francis (1996) found that undergraduates who disclosed their thoughts and feelings about the relatively mild stressor of entering college made fewer illness-related physician visits over the following 2 months than did control participants. As in Pennebaker et al. (1988), the experimental participants in Pennebaker and Francis typically used both

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positive emotion words ($M = 3.2$ words) and negative emotion words ($M = 1.9$ words) in their essays, consistent with their writing about the stress of entering college leading to a coactivation of positivity and negativity. Contrary to the findings of Pennebaker (1993), Pennebaker and Francis found that the use of negative words was uncorrelated with physician visits, whereas the use of positive emotion words was negatively correlated with physician visits.

The use of relatively more positive emotion words has also been shown to benefit individuals facing traumas and other severe stressors. Stein, Folkman, Trabasso, and Richards (1997) examined spoken narratives of caregivers whose partners had recently died of AIDS. Each participant provided narratives 2 weeks, 4 weeks, and 12 months after bereavement. Unlike the undergraduates who were dealing with their transition to college (Pennebaker & Francis, 1996), the bereaved caregivers used nearly twice as many negative emotion words ($M = 13.7$) as positive emotion words ($M = 7.8$). Though Stein et al. did not relate health outcomes to the use of negative and positive words in separate analyses, they did find that those caregivers who used a higher proportion of positive emotion words to total emotion words (i.e., positive + negative) showed more positive health outcomes, including more positive morale and less depressed mood.

In sum, beneficial physical and psychological health outcomes have been associated in some studies with the use of more negative and fewer positive emotion words (Pennebaker, 1993) and in other studies with use of more positive emotion words (e.g., Pennebaker & Francis, 1996) or a higher proportion of positive words (Stein et al., 1997). In light of such seemingly inconsistent findings, it may be useful to consider factors that were held constant within studies but varied across studies. For example, the studies seem to differ in the severity of the traumatic event. How might severity affect the relationship between emotional reactions and health outcomes? Moreover, it may be useful to further consider the psychological significance of the proportion of positive emotion words used (Stein et al., 1997). Participants in disclosure studies wrote essays about salient stressors in their lives, so the use of positive emotion words can be viewed in the context of the negative affect associated with the stressor. Thus, the proportion of positive to total emotions may provide a surrogate measure of the configuration of positive and negative reactions. Whereas high and low proportions denote predominantly positive and negative emotions, respectively, middling proportions denote coactivation of both positive and negative emotions. Rather than examining whether those who express more positive and fewer negative emotions show better or worse health outcomes, this approach allows one to examine the circumstances under which various configurations of positive and negative emotions are associated with beneficial health outcomes.

THE COACTIVATION MODEL OF HEALTHY COPING

We are not suggesting that there is a specific configuration of positive and negative emotions that is most beneficial in all circumstances. Drawing on the literature relating emotional disclosure to coping, Figure 15.1 depicts a model relating emotional reactions to beneficial health outcomes. The model contains a number of features, such as the prediction that health outcomes tend to be worse for severe than for mild stressors and worse when individuals respond with entirely negative rather than entirely positive emotions. In this chapter, however, we focus on the two features that are most relevant to the disclosure literature. First, the relationship between positive or negative emotions and health outcomes is depicted as a series of curvilinear functions, rather than a single linear function. Second, the optimal balance of positive and negative emotions for healthy coping is lower for more severe stressors. That is, effective coping with trivial stressors is associated with primarily positive thoughts and emotions, whereas effective coping with major traumas requires dealing with and working through much more negative information and, hence, is associated with a higher proportion of negative thoughts and emotions.

How does this model account for the extant data? First, we assume that bereavement and one's most traumatic experience, the disclosure topics used by Stein et al. (1997) and Pennebaker (1993), respectively, represent particularly severe stressors and can therefore be depicted on the curve in the bottom panel. The Stein et al. participants used a lower proportion of positive words ($M = 0.4$) than did the Pennebaker participants ($M = 0.5$), which places the Stein et al. study to the left of the Pennebaker et al. study on the curve. These studies produced seemingly inconsistent results, such that the proportion of positive emotions and beneficial health outcomes were directly related in the Stein et al. study but inversely related in the Pennebaker study. The data from these studies are compatible, however, if participants in the Stein et al. study fell to the left of the optimal proportion of positive emotions, whereas participants in the Pennebaker study fell to the right.

In the Pennebaker and Francis (1996) study, participants wrote about entering college. We assume that entering college represents a less severe stressor than bereavement (Stein et al., 1997) or one's most traumatic experience (Pennebaker, 1993). The Pennebaker and Francis study would therefore be expected to reflect the middle panel of Figure 1. The participants in the Pennebaker and Francis study used a higher proportion of positive words ($M = 0.6$) in their essays than did participants in the Pennebaker study ($M = 0.5$). In contrast to Pennebaker, however, Pennebaker and Francis found a direct relationship between proportion of positive emotions and health outcomes. Though these results seem discrepant, they can also be reconciled if the Pennebaker and Francis study fell to the left of

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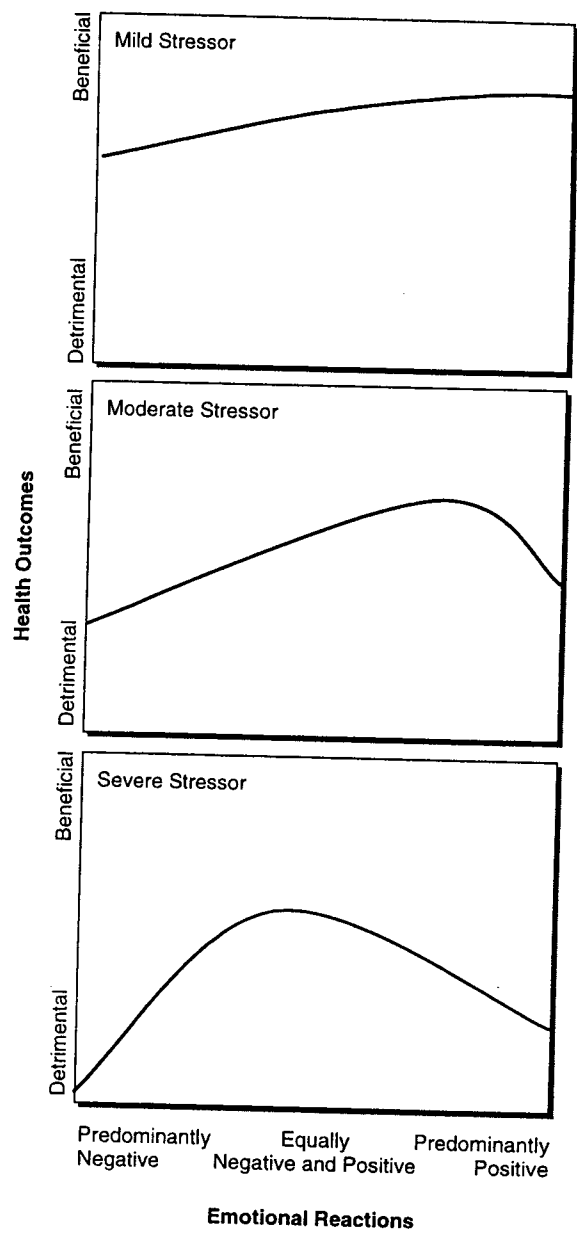


Figure 15.1. The coactivation model of healthy coping. The curves depict a series of curvilinear relationships between emotional reactions to stressors and health outcomes. Beneficial health outcomes are not necessarily associated with entirely positive or entirely negative emotions, but rather with some optimal proportion of positive to total (i.e., positive + negative) emotions. The top, middle, and bottom panels represent stressors of increasing severity. As severity increases, the optimal proportion of positive emotions decreases.

the optimal proportion of positive emotions depicted in the middle panel of Figure 15.1.

Implicit in the coactivation model's prediction that healthy coping is associated with some optimal balance of positive and negative emotions is the additional prediction that the health benefits of disclosure are associated more strongly with coactivation than with neutrality (i.e., the absence of positive and negative emotions). Yet the proportional measure we have used fails to distinguish between individuals experiencing coactivation and neutrality. Evidence for the role of coactivation comes from the basic and often-replicated finding from the disclosure literature that disclosure participants, who typically express more emotions than control participants, also show more beneficial health outcomes than controls. In addition, Spiegel (1998) reviewed evidence that whereas emotional expression can be beneficial among cancer patients (e.g., Spiegel et al., 1989), emotional repression has been associated with detrimental health outcomes (e.g., Jensen, 1987). The extant evidence therefore suggests that beneficial health outcomes are associated more strongly with coactivation than with neutrality.

COACTIVATION AS A CONTRIBUTORY STEP TOWARD COPING

To this point we have argued that the coactivation of positive and negative emotions may be associated with healthy coping. We now consider whether coactivation represents a contributory step toward healthy coping. Although health has typically been conceptualized as the avoidance of stress or disease, positive psychology has begun to reconceptualize health as the possession of the goods in life (Ryff & Singer, 1998). Both models can be seen as providing strategies for healthy coping. To borrow the words of songwriter Johnny Mercer, the former view suggests that individuals dealing with stressful events and the resulting negative emotions must eliminate the negative; the latter view, that such individuals must accentuate the positive. We consider these strategies and their potential limitations for emotion-focused coping, then propose an alternative strategy.

Eliminate the Negative?

The ability to inhibit emotions has been treated as a developmental milestone (e.g., Kopp, 1989) and as an important skill among healthy adults (Tomkins, 1984). Emotional suppression may therefore represent a useful coping strategy. A variety of research, however, including findings that use of negative words during disclosure can be associated with bene-

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ficinal health outcomes, suggests that emotional suppression may not always be most effective. Gross and Levenson (1997), for example, found that undergraduates could suppress their overt emotional reactions to amusing or sad films when instructed to do so, but only at the physiological cost of increased sympathetic activation.

Additional research by Wegner, Erber, and Zanakos (1993) suggests that suppression of negative emotions not only is difficult under cognitive load, but can also have the ironic effect of making negative emotions more accessible. In their study, participants first wrote a brief essay about a personal failure, then tried to either think about or avoid thinking about the failure. In a subsequent Stroop-type color-naming task, words related to failure were more accessible among those participants who had avoided thinking about failure, thus raising the possibility that individuals' attempts to suppress the negative emotions associated with stressors can have insidious effects on affect and cognition. Moreover, theorists have recently implicated thought suppression in the etiology and maintenance of posttraumatic stress disorder, phobias, and other mental disorders (Purdon, 1999).

Accentuate the Positive?

A viable alternative to eliminating the negative may be to accentuate the positive. For example, Folkman and Moskowitz's (2000) review suggests that positive reappraisal (focusing on the good in what is happening or what has happened), problem-focused coping (focusing on thoughts and instrumental behaviors that manage or solve the underlying cause of the distress), and creation of positive events (creating a positive psychological time-out by infusing ordinary events with positive meaning) can benefit coping. Indeed, one of positive psychology's most impressive lines of research has examined the beneficial effects of optimism on health and well-being. Scheier et al. (1989), for example, found that dispositional optimism predicted problem-focused coping, physical recovery, and postsurgical quality of life among coronary surgery patients.

Taylor and Brown's (1988) work on positive illusions shows that even those with unrealistically optimistic outlooks enjoy better psychological health outcomes. Taylor and Brown also argued, however, that although the social environment fosters mild illusions, it does not tolerate extreme illusions (Taylor, 1989; Taylor & Brown, 1994). Supportive evidence comes from Epstein and Meier's (1989) development of the Constructive Thinking Inventory (CTI), which contains factors termed Behavioral Coping and Naïve Optimism, among others. Behavioral Coping entails maintaining an optimistic outlook and planning and carrying out effective action; Naïve Optimism entails simplistic, overly positive thinking. Whereas Behavioral Coping was positively correlated with various indicators of successful living (e.g., academic achievement), Naïve Optimism provided a mixed bag

(Epstein & Meier, 1989). Those high in Naïve Optimism did enjoy more effective social relationships, but they also suffered more physical symptoms of illness.

Take the Good With the Bad?

A third strategy, which is similar to the approach articulated by Folkman and Moskowitz (2000), follows from the notion that healthy coping is associated with some optimal proportion of positive and negative emotions. That is, we suggest that coactivation can play a crucial role in the resolution of stressful events. Turning adversity to advantage requires planning and problem solving, which are served by working memory. Working memory, in turn, involves both an active maintenance of information in short-term memory and an executive control governing the activation of, suppression of, and operation on this information. The activation of memories of stressful events can itself be aversive, thereby reducing the likelihood of subsequent activation. Consistent with this hypothesis, traumatic events appear to be particularly disorganized (Foa & Riggs, 1993) and fail to be integrated into the personal narratives that characterize the processing of memories for ordinary events (Christianson, 1992). If these memories are to be organized, integrated into one's personal narratives, and ultimately transformed into something beneficial, they must be retained in working memory. A key to maintaining stressful negative information in working memory sufficiently long, and with sufficient clarity of mind to grapple with the stressor, may be the simultaneous activation of positive emotional processes—that is, a coactivation of positivity and negativity.

As mentioned above, the ESM holds that coactivation provides indeterminate behavioral guidance and therefore tends to be unstable and aversive (Cacioppo & Berntson, 1994). Nevertheless, unavoidable negative events must be resolved, and coactivation in the short run may be an important step toward instigating the cognitive mediators of healthy coping in the long run. Recent research by Taylor and her colleagues has investigated two such cognitive mediators, specifically, engagement in the stressor and meaning making. Rivkin and Taylor (1999) found that a group of participants who visualized an ongoing stressful event, as well as their own behavioral and emotional reactions to the stressful event, subsequently reported greater engagement coping (Carver, Scheier, & Weintraub, 1989), including greater acceptance of the reality of the event and more positive reinterpretations of the event.

The ability to engage or confront stressors may also promote the ability of individuals to find meaning in the event (cf. Folkman & Moskowitz, 2000). In a study of bereaved HIV-seropositive men, Bower, Kemeny, Taylor, and Fahey (1998) found that effortful, deliberative cognitive processing about traumas was necessary but not sufficient for improved health out-

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comes; only those men who were also able to find meaning in the trauma had better immune function and lower AIDS-related mortality. These findings suggest that coping depends not only on grappling with the stressor, but also on coming to grips with and gaining insight into it.

CONCLUSION

Positive psychology has blazed a new trail across the landscape of contemporary psychology, bringing with it an emphasis on positive factors that promote health and well-being. Although it has long been suspected that the reduction of negative emotions can reduce illness and disease, positive psychology has added the important complement that positive emotions can independently promote health and well-being. What is missing in both literatures is a further consideration of the configuration of positive and negative affective processing, especially when dealing with a major life stressor. Although brooding over trivial failures and tribulations or fixating on the negative aspects of more significant life stressors can be detrimental to health, negative emotions are often aroused for a reason—to interrupt ongoing activity, to counteract a threat, to modify one's actions, or to change one's environment. Although emotion management (Lazarus & Folkman, 1984) may be seen as the ability to reduce negative and enhance positive emotions, we suggest that emotion management might often entail experiencing and working through, rather than simply reducing, negative emotions (see also Gross, 1998). Reflexive withdrawal or denial may improve one's immediate mood but will do little to increase adaptability—a feature of a good life that may be just as important as happiness.

Among those with terminal illness, confronting and overcoming negative emotions may be critical not only to a good life, but to extending life itself. In a landmark study on the relationship between coping and health outcomes, Spiegel et al. (1989) found that breast cancer patients randomly assigned to a support group where they were encouraged to express their feelings about their illness survived on average 37 months, twice as long as control patients survived. Spiegel (1998) reported that breast cancer patients in support-expressive group therapy "came to realize that happiness and sadness are not two poles of one dimension," a point that is central to our coactivation model and to the ESM from which it has been derived (p. 67). These women achieved happiness not by eliminating their negative emotions, but by confronting them. One woman finally attended the Santa Fe Opera only after accepting that she might not be able to wait until she felt better. She later remarked, "I brought my cancer with me and put it in the seat next to me. It was there but I had a wonderful time" (Spiegel, 1998, p. 67). To say that this woman had neutralized her

negative emotions is to miss the point. She did not eliminate her fear; rather, she accepted it. As a result, she engaged her illness, found meaning in it, and ultimately adapted to it.

Spiegel's research also makes clear, however, that it is often not enough to experience negative emotions. Indeed, we have argued that it may be necessary to experience positive emotions if one is to be able to grapple with the negative emotions associated with a stressor. The coactivation of positive and negative affective processes is unstable, unpleasant, and disharmonious, however (Cacioppo et al., 1997, 1999), and thus is best viewed not as a frequent or commonplace affective state but only as a means to a more enduring affective endpoint. Thus, it is conceivable that the ability to experience coactivation and withstand its ambiguous implications for behavior enhances the likelihood that one can work through and transcend major life stressors. As such, the ability to withstand the tension of feeling both positive and negative emotions may represent an important human strength. More generally, although positive psychology has made it clear that an exclusive focus on negative emotions is insufficient, the present perspective implies that an exclusive focus on positive emotions may also ultimately prove insufficient.

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