
EMOTIONS: POSITIVE EMOTIONS AND HEALTH

Folk theories throughout time have promoted the idea that positive emotions are good for your health. This belief dates back at least to biblical times. Proverbs 17:22 advises that “a cheerful heart is a good medicine.” Years later, Norman Cousins’s (1979) chronicle of his battle with a serious collagen illness using humor and laughter rekindled popular interest in this idea. Until recently, however, such widespread sentiments remained as anecdotal wisdom, without a structured theory to explain how or why positive emotions may be useful to health. Given psychology’s penchant to identify, address, and solve problems, research to date has focused primarily on negative emotions. We argue, however, that positive emotions, though relatively mild in nature, are just as noteworthy. In this entry, we discuss Fredrickson’s *broaden-and-build theory* (1998, 2001) to demonstrate that positive emotions may provide a useful antidote to the problems associated with negative emotions. Before we introduce the broaden-and-build theory, we briefly review the literature and demonstrate empirical foundations for the benefits of positive emotions in health.

PHYSICAL AND PSYCHOLOGICAL HEALTH BENEFITS ASSOCIATED WITH POSITIVE EMOTIONS

Researchers have documented numerous salubrious physical and psychological effects associated with positive emotional states. For example, individuals with greater tendencies to use humor to cope (Halley, 1991; Lefcourt, Davidson-Katz, & Kueneman, 1990;

Lefcourt & Thomas, 1998; Stuber, 2002) and who report daily positive mood (Stone et al., 1987; Stone, Neale, Cox, & Napoli, 1994; Stone, Shiffman, & DeVries, 1999) have stronger immune system defenses. In addition, people who are able to regain and maintain positive emotional states are less likely to get sick or to use medical services when faced with a stressful life experience (Catanzaro & Greenwood, 1994; Goldman, Kraemer, & Salovey, 1996). The tendencies to maintain positive emotions, a positive sense of self, and optimistic (even unrealistically optimistic) beliefs of the future act as resources to buffer against the advancement of disease and death (Aspinwall & Taylor, 1997; Taylor, 1983; Taylor & Brown, 1988; Taylor, Kemeny, Reed, Bower & Gruenewald, 2000).

Interventions that promote positive emotions also produce beneficial consequences to health. Pennebaker and his colleagues, for instance, demonstrate that written emotional disclosure can produce significant enhanced health functioning (for a review, see Pennebaker, 1989), especially when positive emotional content is evident in the writings (Pennebaker & Francis, 1996; Pennebaker, Mayne, & Francis, 1997). Corroborating work shows that the advantages associated with positive emotional writing not only provide short-term health benefits, but most important, these benefits can endure for a lifetime. For example, Danner, Snowdon, and Friesen (2001) found that the positive emotional content in the autobiographies of nuns in early adulthood predicted the likelihood of being alive six decades later. Relatedly, Ostir, Markides, Peek, and Goodwin (2001) report that positive emotions in elderly adults protect against physical debility in old age (e.g., less incidents of stroke). In all, these findings exhibit that positive emotions may be valuable tools not only for immediate health concerns but also for establishing long-term beneficial outcomes.

Physical health benefits associated with positive emotions are further established in research on optimism, a dispositional attribute associated with positive emotions. For example, optimists (compared to pessimists) are less likely to suffer from angina and heart attacks (Kubzansky, Sparrow, Vokonas, & Kawachi, 2001) and show better physical recovery immediately after coronary artery bypass surgery and up to 6 months postsurgery (Carver & Scheier, 1998). Taken together, these studies suggest that the relation between physical health and positive dispositional styles (e.g., optimism) may be due in part to the

chronic positive emotional states engendered by the personality style.

In addition to promoting physical health, cultivating positive emotions is associated with psychological health as well (cf. Fredrickson, Maynard, et al., 2000). For instance, coping strategies related to the occurrence and maintenance of positive emotions (e.g., positive reappraisal, problem-focused coping, infusing ordinary events with positive meaning) have been documented as serving to help buffer against stress (Folkman & Moskowitz, 2000; Park & Folkman, 1997; Schaefer & Moos, 1992) and depressed mood (Davis, Nolen-Hoeksema, & Larson, 1998). These strategies help individuals emerge from crises with new coping skills, closer relationships, and a richer appreciation for life, all of which predict increases in psychological well-being.

Empirical support for the prediction that positive emotions are important facilitators of adaptive coping and adjustment to acute and chronic stress is documented in a number of studies (for a review see Folkman & Moskowitz, 2000). For instance, men who were able to find positive meaning when caring for their partners with AIDS were found to cope more effectively with the distress associated with caregiving and bereavement (Folkman, 1997). Similarly, women who found benefits despite hazardous child delivery and prolonged hospitalization postdelivery evidenced greater well-being, which extended to the developmental well-being of their children (Affleck, Tennen, & Rowe, 1991). The occurrence of positive emotions amidst adversity may provide the necessary psychological rest to help buffer against stress, replenish, and restore further coping efforts (Lazarus, Kanner, & Folkman, 1980).

The Broaden-and-Build Theory of Positive Emotions

What functional significance do positive emotions have in promoting favorable consequences of health? A valuable framework from which to understand why and how positive emotions may be useful is Fredrickson's (1998) broaden-and-build theory of positive emotions. Fredrickson (1998, 2001) has argued that, whereas negative emotions heighten people's autonomic activity and narrow their attention to support specific action tendencies (e.g., attack, escape), positive emotions quell autonomic arousal because they broaden people's attention, thinking, and behavioral

repertoires. The broadening effects can be evidenced in the number of thought-action urges related to particular positive emotions: to play and create when experiencing joy, to explore when experiencing interest, to savor and integrate when experiencing contentment, and to combine play, exploration, and savoring when experiencing love (Fredrickson, 1998).

Evidence for cognitive broadening has been illustrated in a program of research conducted by Isen and colleagues. Across several studies, they have shown that induced positive emotions produce patterns of thought that are notably unusual (Isen, Johnson, Mertz, & Robinson, 1985), flexible (Isen & Daubman, 1984), creative (Isen, Daubman, & Nowicki, 1987), integrative (Isen, Rosenzweig, & Young, 1991), open to information (Estrada, Isen, & Young, 1997), and efficient (Isen & Means, 1983; Isen et al., 1991). As well, induced positive emotions increase people's preferences for variety and broaden their arrays of acceptable behavioral options (Kahn & Isen, 1993). These cognitive effects of positive emotions have been linked to increases in brain dopamine levels (Ashby, Isen, & Turken, 1999). In recent work, Fredrickson and Branigan (2002) demonstrate that, relative to neutral states and negative emotions, positive emotions ranging from low activation (contentment/serenity) to high activation (joy/amusement) broaden the scope of people's visual attention as well as their momentary thought-action repertoires (see also Gasper & Clore, 2002).

According to Fredrickson's theory, these broadened mindsets, in turn, have the effect of *building* an individual's physical, intellectual, psychological, and social resources. Positive emotions can momentarily broaden people's modes of thinking, which in turn can improve one's well-being. Over time, and with repeated experiences of positive emotions, a broadened mindset might become habitual. By consequence, then, the often incidental effect of experiencing a positive emotion is an increase in one's personal resources. Most important, the arsenal of personal resources produced by positive emotions can be drawn on in times of need and used to plan for future outcomes, which may be valuable in facilitating healthy behavioral practices (Fredrickson, Maynard, et al., 2000).

Undoing Effect of Positive Emotions

Evidence for the broadening hypothesis of the broaden-and-build theory (Fredrickson, 1998, 2001)

has clear implications for the strategies that people use to regulate their negative experiences. Negative emotions narrow the momentary thought-action repertoire, producing autonomic nervous system activation, such as increases in heart rate, vasoconstriction, and blood pressure (Fredrickson, Maynard, et al., 2000; Gross, Fredrickson, & Levenson, 1994; Levenson, Ekman, & Friesen, 1990; Ohman, 2000). In contrast, as we have discussed, positive emotions broaden this same repertoire. As such, positive emotions ought to function as efficient antidotes for the lingering effects of negative emotions. In other words, positive emotions might "correct" or "undo" the aftereffects of negative emotions; we call this the undoing hypothesis (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000).

We tested the undoing hypothesis by experimentally inducing high-arousal negative emotion (which engenders increases in cardiovascular arousal) and then randomly assigning participants to view emotionally evocative films. We then measured the time elapsed from the start of the randomly assigned film until the cardiovascular reactions induced by the negative emotion returned to baseline levels. In three independent samples, participants in two positive emotion conditions (high activation: joy/amusement, and low activation: contentment/serenity) exhibited faster cardiovascular recovery than those in a neutral control condition, and faster than those in a sadness condition, which exhibited the most protracted recovery (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, et al., 2000).

Resilience and Positive Emotions

To the extent that positive emotions broaden an individual's array of thoughts and actions, helping to undo the lingering aftereffects of negative emotions, the broaden-and-build theory (Fredrickson, 1998, 2001) proposes that positive emotions should, in turn, help to build personal resources, such as psychological resilience. Theoretical descriptions of psychological resilience indicate that resilient individuals are able to "bounce back" from stressful experiences quickly and efficiently (Carver, 1998; Lazarus, 1993). This theoretical definition suggests that, compared to their less resilient counterparts, resilient individuals would exhibit faster cardiovascular recovery from negative emotional arousal. Together with our work on the undoing hypothesis (Fredrickson & Levenson,

1998; Fredrickson et al., 2000), the broaden-and-build theory suggests that this ability to bounce back to cardiovascular baseline may be fueled by experiences of positive emotion.

In line with previous correlational studies reporting on a link between positive emotionality and psychological resilience (e.g., Block & Kremen, 1996; Klohnen, 1996; Kumpfer, 1999; Masten, Best, & Garmezy, 1990; Werner & Smith, 1992), we predicted that positive emotions contribute to the effects of psychological resilience on effective emotion regulation. We induced negative emotion in participants with a time-pressured speech preparation task. Individuals high in self-reported psychological resilience (Block & Kremen, 1996) reported greater positive emotions in general and in response to the speech preparation task. Moreover, those with higher resilience demonstrated faster cardiovascular recovery from the speech task. Most important, positive emotions at least partially mediated the effect of resilience on cardiovascular recovery. These findings suggest that resilient people may harness positive emotions and use them “intelligently” to achieve their superior coping outcomes (Tugade & Fredrickson, 2002).

Positive Emotions Build Enduring Resources

To the extent that positive emotions broaden thinking and build enduring psychological resources like resilience, they should also trigger upward spirals toward enhanced emotional well-being. Research on depression had already documented a downward spiral in which depressed mood and the narrowed, pessimistic thinking it brings, influence one another reciprocally, leading to ever worsening functioning and moods, and even clinical levels of depression. In contrast, the broaden-and-build theory predicts a comparable upward spiral in which positive emotions and the broadened thinking they bring also influence one another reciprocally, leading to appreciable increases in functioning and well-being (Fredrickson & Joiner, 2002). Fredrickson and Joiner (2002) examined affective experiences and broad-minded coping (e.g., considering different ways to deal with problems) across two assessment periods, five weeks apart. They found that the effects of positive emotions on well-being increased over time, creating an upward spiral towards enhanced well-being. Positive emotions predicted improved broad-minded coping, which in turn, predicted increases in subsequent experiences of positive

emotions. And again, new experiences of positive emotions enhanced future coping behavior, and so on.

In line with this conceptualization, recently, we have found that positive emotions help to build psychological resources that are essential in coping effectively with traumatic circumstances, such as the September 11, 2001, terrorist attacks on the United States. As part of our ongoing research on positive emotions and resilience, we studied a sample of students prior to the terrorist attacks. This afforded us the opportunity to make a prospective assessment of the benefits of psychological resilience and positive emotions in this crisis. We found that higher psychological resilience was associated with greater experiences of positive emotions, such as gratitude, interest, and love amidst negative emotions, such as anger, sadness, and fear. In addition, higher resilience was linked to postcrisis growth (indexed by increases in optimism, subjective well-being, tranquility). In line with the broaden-and-build theory (Fredrickson, 1998, 2001), postcrisis experiences of positive emotions fully mediated the effect of psychological resilience on psychological growth after the attacks (Fredrickson, Tugade, Waugh, & Larkin, 2002).

CONCLUSIONS

The broaden-and-build theory (Fredrickson, 1998, 2001) proposes that positive emotions are useful to health in many ways. They facilitate healthy behavior in the present by broadening one's thoughts and attention, which set the stage for creative and innovative pursuits when faced with negative situations. As well, positive emotions build personal and social resources, which serve as protective factors useful in promoting good health in the future. New research indicates that finding ways to cultivate meaningful positive emotions is a critical necessity for optimal physical and psychological functioning. Indeed, positive emotions are good for your health. With increasing research, we continue to empirically substantiate age-old folk theories about positive emotions and health that have persisted through time.

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See also EMOTIONS: NEGATIVE EMOTIONS AND HEALTH

Further Reading

Affleck, G., Tennen, H., & Rowe, J. (1991). *Infants in crisis: How parents cope with newborn intensive care and its aftermath*. New York: Springer-Verlag.

- Ashby, F. G., Isen, A. M., & Turken, A. U. (1999). A neurophysiological theory of positive affect and its influence on cognition. *Psychological Review*, *106*, 529-550.
- Aspinwall, L. G., & Taylor, S. E. (1997). A stitch in time: Self-regulation and proactive coping. *Psychological Bulletin*, *121*, 417-436.
- Block, J., & Kremen, A. M. (1996). IQ and ego-resiliency: Conceptual and empirical connections and separateness. *Journal of Personality and Social Psychology*, *70*, 349-361.
- Carver, C. S. (1998). Resilience and thriving: Issues, models and linkages. *Journal of Social Issues*, *54*, 245-266.
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. New York: Cambridge University Press.
- Catanzaro, S. J., & Greenwood, G. (1994). Expectancies for negative mood regulation, coping, and dysphoria among college students. *Journal of Counseling Psychology*, *41*, 34-44.
- Cousins, N. (1979). *Anatomy of an illness*. New York: Bantam Books.
- Danner, D. D., Snowdon, D. A., & Friesen, W. V. (2001). Positive emotions in early life and longevity: Findings from the nun study. *Journal of Personality & Social Psychology*, *80*, 804-813.
- Davis, C. G., Nolen-Hoeksema, S., & Larson, J. (1998). Making sense of loss and benefiting from experience: Two construals of meaning. *Journal of Personality and Social Psychology*, *75*, 561-574.
- Estrada, C. A., Isen, A. M., & Young, M. J. (1997). Positive affect facilitates integration of information and decreases anchoring in reasoning among physicians. *Organizational Behavioral and Human Decision Processes*, *77*, 117-136.
- Folkman, S. (1997). Positive psychological states and coping with severe stress. *Social Science and Medicine*, *45*, 1207-1221.
- Folkman, S., & Moskowitz, J. T. (2000). Positive affect and the other side of coping. *American Psychologist*, *55*, 647-654.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology: New Directions in Research on Emotion*, *2* [Special Issue], 300-319.
- Fredrickson, B. L. (2000). Cultivating positive emotions to optimize health and well-being. *Prevention and Treatment*, *3*. Retrieved from <http://journals.apa.org/prevention>
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56* [Special Issue], 218-226.
- Fredrickson, B. L., & Branigan, C. A. (2002). *Positive emotions broaden the scope of attention and thought-action repertoires: Evidence for the broaden-and-build theory*. Manuscript submitted for publication.
- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychological Science*, *13*, 172-175.
- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition and Emotion*, *12*, 191-220.
- Fredrickson, B. L., Mancuso, R. A., Branigan, C., & Tugade, M. M. (2000). The undoing effect of positive emotions. *Motivation and Emotion*, *24*, 237-258.
- Fredrickson, B. L., Maynard, K. E., Helms, M. J., Haney, T. L., Siegler, I. C., & Barefoot, J. C. (2000). Hostility predicts magnitude and duration of blood pressure response to anger. *Journal of Behavioral Medicine*, *23*, 229-243.
- Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. (2002). *What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001*. Manuscript submitted for publication.
- Gasper, K., & Clore, G. L. (2002). Attending to the big picture: Mood and global versus local processing of visual information. *Psychological Science*, *13*, 34-40.
- Goldman, S. L., Kraemer, D. T., & Salovey, P. (1996). Beliefs about mood moderate the relationship of stress to illness and symptom reporting. *Journal of Psychosomatic Research*, *41*, 115-128.
- Gross, J. J., Fredrickson, B. L., & Levenson, R. W. (1994). The psychophysiology of crying. *Psychophysiology*, *31*, 460-468.
- Halley, F. M. (1991). Self-regulation of the immune system through biobehavioral strategies. *Biofeedback & Self Regulation*, *16*, 55-74.
- Isen, A. M., & Daubman, K. A. (1984). The influence of affect on categorization. *Journal of Personality and Social Psychology*, *47*, 1206-1217.
- Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Social Psychology*, *52*, 1122-1131.
- Isen, A. M., Johnson, M. M. S., Mertz, E., & Robinson, G. F. (1985). The influence of positive affect on the unusualness of word associations. *Journal of Personality and Social Psychology*, *48*, 1413-1426.
- Isen, A. M., & Means, B. (1983). The influence of positive affect on decision-making strategy. *Social Cognition*, *2*, 118-131.

- Isen, A. M., Rosenzweig, A. S., & Young, M. J. (1991). The influence of positive affect on clinical problem solving. *Medical Decision Making, 11*, 221-227.
- Kahn, B. E., & Isen, A. M. (1993). The influence of positive affect on variety seeking among safe, enjoyable products. *Journal of Consumer Research, 20*, 257-270.
- Klohn, E. C. (1996). Conceptual analysis and measurement of the construct of ego-resiliency. *Journal of Personality and Social Psychology, 70*, 1067-1079.
- Kubzansky, L. D., Sparrow, D., Vokonas, P., & Kawachi, I. (2001). Is the glass half empty or half full? A prospective study of optimism and coronary heart disease in the normative aging study. *Psychosomatic Medicine, 63*, 910-916.
- Kumpfer, K. L. (1999). Factors and processes contributing to resilience: The resilience framework. In M. D. Glantz & J. L. Johnson (Eds.), *Resilience and development: Positive life adaptations* (pp. 179-224). New York: Kluwer Academic/Plenum.
- Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology, 44*, 1-21.
- Lazarus, R. S., Kanner, A. D., & Folkman, S. (1980). Emotions: A cognitive-phenomenological analysis. In R. Plutchik & H. Kellerman (Eds.), *Theories of emotion* (pp. 189-217). New York: Academic Press.
- Lefcourt, H. M., Davidson-Katz, K., & Kueneman, K. (1990). Humor and immune-system functioning. *Humor: International Journal of Humor Research, 3*, 305-321.
- Lefcourt, H. M., & Thomas, S. (1998). Humor and stress revisited. In W. Ruch (Ed.), *The sense of humor: Explorations of a personality characteristic* (pp. 179-202). Berlin, Germany: Walter de Gruyter.
- Levenson, R. W., Ekman, P., & Friesen, W. V. (1990). Voluntary facial action generates emotion-specific autonomic nervous system activity. *Psychophysiology, 27*, 363-384.
- Masten, A. S., Best, K. M., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology, 2*, 425-444.
- Ohman, A. (2000). Fear and anxiety: Evolutionary, cognitive, and clinical perspectives. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 573-593). New York: Guilford.
- Ostir, G. V., Markides, K. S., Peek, M. K., & Goodwin, J. S. (2001). The association between emotional well-being and the incidence of stroke in older adults. *Psychosomatic Medicine, 63*, 210-215.
- Park, C. L., & Folkman, S. (1997). Meaning in the context of stress and coping. *Review of General Psychology, 1*, 115-144.
- Pennebaker, J. W. (1989). Stream of consciousness and stress: Levels of thinking. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 327-350). New York: Guilford.
- Pennebaker, J. W., & Francis, M. E. (1996). Cognitive, emotional, and language processes in disclosure. *Cognition & Emotion, 10*, 601-626.
- Pennebaker, J. W., Mayne, T. J., & Francis, M. E. (1997). Linguistic predictors of adaptive bereavement. *Journal of Personality & Social Psychology, 72*, 863-871.
- Schaefer, J. A., & Moos, R. H. (1992). Life crises and personal growth. In B. Carpenter (Ed.), *Personal coping: Theory, research, and application* (pp. 149-170). Westport, CT: Praeger.
- Stone, A. A., Cox, D. S., Valdimarsdottir, H., & Jandorf, L. (1987). Evidence that secretory IgA antibody is associated with daily mood. *Journal of Personality & Social Psychology, 52*, 988-993.
- Stone, A. A., Neale, J. M., Cox, D. S., Napoli, A., Valdimarsdottir, H., & Kennedy-Moore, E. (1994). Daily events are associated with a secretory immune response to an oral antigen in men. *Health Psychology, 13*, 440-446.
- Stone, A. A., Shiffman, S. S., & DeVries, M. W. (1999). Ecological momentary assessment. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 26-39). New York: Russell Sage.
- Stuber, M. (2002, February). *Humor and immune function*. Lecture presented at the University of California, San Diego, CA.
- Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist, 38*, 1161-1173.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin, 103*, 193-210.
- Taylor, S. E., Kemeny, M. E., Reed, G. M., Bower, J. E., & Gruenewald, T. L. (2000). Psychological resources, positive illusions, and health. *American Psychologist, 55*, 99-109.
- Tugade, M. M., & Fredrickson, B. L. (2002). Positive emotions and emotional intelligence. In L. Feldman Barrett & P. Salovey (Eds.), *The wisdom of feelings: Psychological processes in emotional intelligence* (pp. 319-340). New York: Guilford.
- Tugade, M. M., & Frederickson, B. L. (in press). Resilient individuals use positive emotions to bounce back from

negative emotional experiences. *Journal of Personality and Social Psychology*.

Werner, E., & Smith, R. S. (1992). *Overcoming the odds: High-risk children from birth to adulthood*. Ithaca, NY: Cornell University Press.