

Positive Affect and Health

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ABSTRACT—*Negative affective styles such as anxiety, depression, and hostility have long been accepted as predictors of increased risk for illness and mortality. In contrast, positive affective styles have been relatively ignored in the health literature. Here we highlight consistent patterns of research associating trait positive affect (PA) and physical health. The evidence we review suggests an association of trait PA and lower morbidity and decreased symptoms and pain. PA is also associated with increased longevity among community-dwelling elderly. The association of PA and survival among those with serious illness is less clear and suggests the possibility that PA may be harmful in some situations. We conclude by raising conceptual and methodological reservations about this literature and suggesting directions for future research.*

KEYWORDS—*positive emotion; positive affect; morbidity; mortality; health; symptoms*

The role of emotions in physical health has been a central topic in health psychology for some time. Emotions are thought to represent the principal pathway linking psychological stress to disease, and enduring affective styles such as anxiety and depression have been found to be associated with greater morbidity and mortality. However, when health psychologists have referred to the roles of emotions and affect in health, they have typically meant negative emotions such as anger, depression, and anxiety. Only recently has there been any serious discussion of the potential effect of positive affect (PA).

One challenge in making sense of the literature on PA and health is that there is little agreement on what is meant by PA. We define positive emotion or affect as feelings that reflect a level of pleasurable engagement with the environment, such as happiness, joy, excitement, enthusiasm, and contentment (Clark, Watson, & Leeka, 1989). These can be brief, longer lasting, or more stable trait-like feelings. Importantly, the lack of positive engagement does not necessarily imply negative affect such as anger, anxiety, and depression.

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REVIEW

The strongest links between positive emotions and health are found in studies that examine trait affective style, which reflects a person's typical emotional experience, rather than state affect, which reflects momentary responses to events. Here we provide short descriptions of the associations between trait PA and mortality (longevity), morbidity (illness onset), survival from life-threatening disease, and reports of symptoms and pain. (For a comprehensive review of this literature see Pressman & Cohen, 2005). The studies we review use prospective designs that help to eliminate the explanation that being sick resulted in lower PA. This is done by measuring PA and health at study onset (baseline) and assessing whether PA predicts changes in health over the follow-up period. Because the measure of PA is given before the change in health, it cannot have been caused by that change. Many, but not all, of the studies also include controls for spurious (third) factors such as age, sex, socioeconomic status, and race/ethnicity. Overall, the literature reviewed here is provocative, although it suffers from a range of methodological and conceptual limitations. It does however allow us to highlight both consistencies in results as well as the issues that need to be addressed to ultimately determine if a positive affective style is an important predictor of good health.

Mortality

A study that has received considerable attention evaluated PA by coding autobiographical writing samples collected from a group of nuns when they were in their early twenties (Danner, Snowdon, & Friesen, 2001). The greater the number of positive emotion words and sentences, the greater was the probability (adjusting for age and education) of being alive 60 years later. In contrast, the number of negative emotions reported was not associated with mortality.

However, the overall evidence on PA and mortality is more complex. Most (seven) of these studies have been done in elderly persons (average age over 60) living either on their own or with their families. These studies are virtually unanimous in linking positive emotional dispositions to longer life. But positive emotions are not generally associated with increased longevity in studies of other populations. For example, two studies suggest that institutionalized elderly with high PA are at increased risk

of mortality (Janoff-Bulman & Marshall, 1982; Stones, Dornan, & Kozma, 1989) and an analysis of a sample of gifted children found that PA during childhood was associated with greater risk for death 65 years later (Friedman et al., 1993).

Illness Onset

In a study from our own laboratory (Cohen, Doyle, Turner, Alper, & Skoner, 2003), 334 adult volunteers were phone interviewed seven times over a 3-week period. For each interview, participants rated how accurately each of nine positive and nine negative adjectives described how they felt over the last day. Examples of PA items included *lively, energetic, happy, cheerful, at ease, and calm*. Examples of negative-affect (NA) items included *sad, depressed, nervous, and hostile*. Daily mood scores were calculated and averaged across the 7 days to create summary measures of trait PA and NA. Subsequently, subjects were exposed to one of two viruses that cause a common cold and were monitored for 5 days for the development of clinical illness. Colds were defined by objective markers of illness, including infection, mucus production (assessed by weighing tissues), and congestion (assessed by the amount of time it took for a dye put into the nostrils to reach the back of the throat). Those with high levels of PA were less likely to develop a cold when exposed to a virus (see Fig. 1). This relationship remained after controlling for age, sex, immunity (baseline antibody to the experimental virus), education, and NA.

In other morbidity studies, trait PA has been associated with lower rates of stroke among noninstitutionalized elderly (Ostir, Markides, Peek, & Goodwin, 2001), lower rates of rehospitalization for coronary problems (Middleton & Byrd, 1996), fewer injuries (e.g., Koivumaa-Honkanen et al., 2000) and improved pregnancy outcomes among women undergoing assisted fertilization (Klonoff-Cohen, Chu, Natarajan, & Sieber, 2001). These

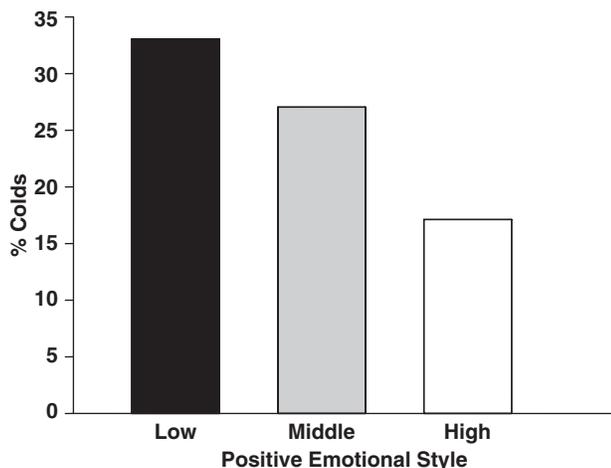


Fig. 1. The association between trait positive emotional style and the incidence of the common cold as diagnosed through objectively assessed markers of disease (infection, mucus weights, and congestion). Adapted from data reported in Cohen, Doyle, Turner, Alper, & Skoner (2003).

studies are often limited by a lack of control for factors such as NA, optimism, and personal control that may influence both PA and disease susceptibility, and many do not rule out the possibility that PA itself (e.g., endorsing of items such as *energetic, full-of-pep, and vigorous*) is merely a marker of subclinical disease processes.

Survival

A popular hypothesis is that trait PA increases longevity of persons suffering from life-threatening disease. However, comparatively few studies have examined whether PA predicts survival among people with chronic diseases, and available findings are at best mixed. A pattern of results does however suggest a hypothesis. Individuals with diseases that have decent prospects for long-term survival, such as early-stage breast cancer, coronary heart disease, and AIDS, may benefit from PA. However, high levels of trait PA may be detrimental to the health of individuals who have advanced diseases with poor and short-term prognoses—e.g., patients with melanoma, metastatic breast cancer, and end-stage renal disease—possibly as a consequence of underreporting of symptoms resulting in inadequate care, or of a lack of adherence to treatment (Pressman & Cohen, 2005).

Symptoms and Pain

There is considerable evidence linking PA to reports of fewer symptoms, less pain, and better health. These outcomes have practical importance, but there is reason to think that this association may be driven primarily by PA influences on how people perceive their bodies rather than by affect-elicited changes in physiological processes (e.g., Pennebaker, 1983).

For example, a study from our own lab suggests that trait PA is associated with less symptom reporting when objective disease is held constant (Cohen et al., 2003). As described earlier, PA and NA were assessed by averaging responses across seven nightly interviews. Volunteers were then exposed to a virus that causes the common cold and monitored for objective signs of illness. To test whether trait affect could influence symptom reporting, we predicted self-reported cold symptoms (collected for 5 days following viral exposure) from trait affect, controlling for the objective markers of disease mentioned earlier. When objective signs of illness were held constant, those higher in trait PA reported less severe symptoms, and those higher in trait NA reported more severe ones. Figure 2 presents the residual scores derived from the PA analysis. These scores represent the extent to which one reports more (+ scores) or fewer (– scores) symptoms than would be predicted from the objective markers of disease. Interestingly, when both PA and NA were entered in the same regression equation, only PA continued to predict symptom reporting, suggesting that low PA (not high NA) may be the driving force in the reporting of unbound symptoms.

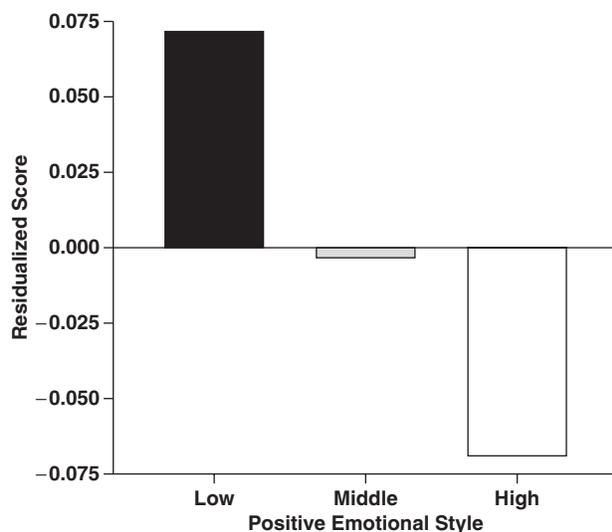


Fig. 2. The association between trait positive emotional style and self-reported symptoms, controlling for objective markers of disease (infection, mucus weights, and congestion). Residualized score represents the extent to which one reports more or fewer symptoms than is predicted by objective signs of illness. Scores above 0 indicate more symptoms than expected and those below 0 indicate fewer symptoms than expected. Adapted from data reported in Cohen, Doyle, Turner, Alper, & Skoner (2003).

Other prospective evidence also reveals that trait PA predicts better self-reported health, fewer symptoms in the elderly, and less pain among rheumatoid arthritis and fibromyalgia patients. Interestingly, experimental evidence suggests that inducing state PA in both healthy and mildly ill individuals results in more favorable self-evaluations of health as compared to individuals induced to feel NA and a neutral control condition (e.g., Salovey & Birnbaum, 1989).

Although these data are provocative, many of these studies also found that NA was associated with greater symptom reporting and poorer self-reported health, begging the question of whether NA or PA is responsible for the effects found. However, there are several studies, like the one described at the beginning of this section, that provide evidence that PA effects on self-reported health are independent of, and often stronger than, those of NA.

LIMITATIONS OF THE EXISTING LITERATURE

Overall, there is provocative evidence that trait PA may influence health and well-being. Strong inferences are not yet possible, however. One problem in interpreting this literature is that in many cases it is difficult to distinguish between the effects of positive and negative emotions. For example, do community-residing elderly live longer because they are happy or because they are not sad? Interestingly, people's experiences of positive and negative emotions are partly independent in some circumstances (e.g., Diener & Emmons, 1985). For instance, in looking back over the last year of one's life (a typical trait PA measure), one can reasonably report having been both happy and sad. A

definitive answer to whether positive or negative emotions are making independent contributions to a health outcome can only come from studies that measure both types of emotions separately. Surprisingly, studies that have focused on the effects of negative emotions on health have similarly failed to control for positive emotions. Consequently, it is difficult to conclude from the existing literature whether sadness results in a less healthy, shorter life or whether happiness leads to a healthier and longer one.

There is also concern that some measures of positive emotions may themselves be markers of associated cognitive and social dispositions such as extraversion, self-esteem, personal control, and optimism. In general, these factors have moderate associations with trait PA, but few existing studies control for the possibility that they, and not PA, are responsible for any associations with health that are found. A further issue with PA measurement is that some types of PA may themselves be direct indicators of physical health. For example, endorsing adjectives such as *energetic*, *full-of-pep*, and *vigorous* may reflect a positive mood, but may also reflect how healthy one feels. Self-rated health has been found to predict illness and longevity above and beyond objective health measures such as physician ratings. Consequently, it is important for future work to include standard measures of self-rated health to help exclude the possibility that we are merely predicting good objective health from good perceived health masquerading as positive emotions.

Another issue is the potential importance of differentiating activated (e.g., enthusiastic, joyful) and nonactivated (e.g., calm, content) affect. Health researchers consider physiological arousal to be a primary pathway through which emotions may influence health. It is thus likely that the arousing nature of an emotion, not only its valence, plays into its potential influences on health outcomes. This is especially relevant given that most measures of PA assess primarily activated emotions.

It is also unclear whether it is important to distinguish among the various subcomponents of PA, such as happiness, elation, and joy, or whether these affects cluster together in experience or in the manner by which they influence health. Few studies explicitly compare different positive emotions or compare individual emotions to a PA aggregate. Finally, there is evidence that the expression of PA varies across cultures, even Western cultures. Consequently, it is difficult to know to what extent this work would apply outside of the United States.

HOW COULD PA IMPROVE HEALTH?

Higher trait PA has been associated with better health practices such as improved sleep quality, more exercise, and more intake of dietary zinc, as well as with lower levels of the stress hormones epinephrine, norepinephrine, and cortisol (Pressman & Cohen, 2005). PA has also been hypothesized to be associated with other health-relevant hormones, including increases in oxytocin and growth hormone and secretion of endogenous

opioids. Induced PA in the laboratory has been shown to alter various aspects of immune function, although the direction of changes are not entirely consistent and seem to be dependent on details of the manipulation and the degree of arousal produced via the induction (see Pressman & Cohen, 2005). PA may also influence health by altering social interactions. Persons who report more PA socialize more often and maintain more and higher-quality social ties. PA may result in more and closer social contacts because it facilitates approach behavior and because others are drawn to form attachments with pleasant individuals. More diverse and closer social ties have been associated with lower risk for both morbidity and premature mortality. Finally, health care providers may be more attentive to persons with more pleasant affect.

As an alternative to the arguments above, which assume that PA directly affects health, PA may influence health primarily through its ability to ameliorate the potentially pathogenic influences of stressful life events. For example, Fredrickson (1998) suggests that positive emotions encourage exploration and creativity and result in the building of social, intellectual, and physical resources. Similarly, Salovey, Rothman, Detweiler, and Steward (2000) suggest that positive emotions generate psychological resources by promoting resilience, endurance, and optimism.

WHERE DO WE GO FROM HERE?

Some key strategies to move this literature forward include (a) using more sophisticated measures of PA to differentiate between dimensions of affect (e.g., activated vs. unactivated; discrete positive emotions); (b) including both PA and NA in studies in order to assess whether they have independent associations with health outcomes; (c) including social and cognitive factors that correlate with PA, such as extraversion, personal control, purpose, self-esteem, and optimism, in order to assess whether these factors are responsible for associations attributed to PA; (d) including measures of self-reported health to exclude it as an alternative explanation; and (e) assessing alternative pathways through which PA could influence health.

Overall, we consider the literature associating trait PA with health provocative but not definitive. Nonetheless, the current findings should encourage those interested in affect and health to include PA as a potential predictor and to test the potential pathways that may link PA to health.

Recommended Reading

- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin*, *131*, 803–855.
- Pressman, S.D., & Cohen, S. (2005). (See References)
- Salovey, P., Rothman, A.J., Detweiler, J.B., & Steward, W.T. (2000). (See References)
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REFERENCES

- Clark, L.A., Watson, D., & Leeka, J. (1989). Diurnal variation in the positive affects. *Motivation and Emotion*, *13*, 205–234.
- Cohen, S., Doyle, W.J., Turner, R.B., Alper, C.M., & Skoner, D.P. (2003). Emotional style and susceptibility to the common cold. *Psychosomatic Medicine*, *65*, 652–657.
- 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.
- Diener, E., & Emmons, R.A. (1985). The independence of positive and negative affect. *Journal of Personality and Social Psychology*, *47*, 1105–1117.
- Fredrickson, B.L. (1998). What good are positive emotions? *Review of General Psychology*, *2*, 300–319.
- Friedman, H.S., Tucker, J.S., Tomlinson-Keasey, C., Schwartz, J.E., Wingard, D.L., & Criqui, M.H. (1993). Does childhood personality predict longevity? *Journal of Personality & Social Psychology*, *65*, 176–185.
- Janoff-Bulman, R., & Marshall, G. (1982). Mortality, well-being, and control: A study of a population of institutionalized aged. *Personality & Social Psychology Bulletin*, *8*, 691–698.
- Klonoff-Cohen, H., Chu, E., Natarajan, L., & Sieber, W. (2001). A prospective study of stress among women undergoing in vitro fertilization or gamete intrafallopian transfer. *Fertility & Sterility*, *76*, 675–687.
- Koivumaa-Honkanen, H., Honkanen, R., Viinamaki, H., Heikkila, K., Kaprio, J., & Koskenvuo, M. (2000). Self-reported life satisfaction and 20-year mortality in healthy Finnish adults. *American Journal of Epidemiology*, *152*, 983–991.
- Middleton, R.A., & Byrd, E.K. (1996). Psychosocial factors and hospital readmission status of older persons with cardiovascular disease. *Journal of Applied Rehabilitation Counseling*, *27*, 3–10.
- 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.
- Pennebaker, J.W. (1983). *The psychology of physical symptoms*. New York: Springer-Verlag.
- Pressman, S.D., & Cohen, S. (2005). Does positive affect influence health? *Psychological Bulletin*, *131*, 925–971.
- Salovey, P., & Birnbaum, D. (1989). Influence of mood on health-relevant cognitions. *Journal of Personality & Social Psychology*, *57*, 539–551.
- Salovey, P., Rothman, A.J., Detweiler, J.B., & Steward, W.T. (2000). Emotional states and physical health. *American Psychologist*, *55*, 110–121.
- Stones, M.J., Dornan, B., & Kozma, A. (1989). The prediction of mortality in elderly institution residents. *Journals of Gerontology*, *44*, P72–P79.