

Happiness Unpacked: Positive Emotions Increase Life Satisfaction by Building Resilience

Michael A. Cohn
University of California San Francisco

Barbara L. Fredrickson
University of North Carolina at Chapel Hill

Stephanie L. Brown
University of Michigan

Joseph A. Mikels
Cornell University

Anne M. Conway
University of Pittsburgh

Happiness—a composite of life satisfaction, coping resources, and positive emotions—predicts desirable life outcomes in many domains. The broaden-and-build theory suggests that this is because positive emotions help people build lasting resources. To test this hypothesis, the authors measured emotions daily for 1 month in a sample of students ($N = 86$) and assessed life satisfaction and trait resilience at the beginning and end of the month. Positive emotions predicted increases in both resilience and life satisfaction. Negative emotions had weak or null effects and did not interfere with the benefits of positive emotions. Positive emotions also mediated the relation between baseline and final resilience, but life satisfaction did not. This suggests that it is in-the-moment positive emotions, and not more general positive evaluations of one's life, that form the link between happiness and desirable life outcomes. Change in resilience mediated the relation between positive emotions and increased life satisfaction, suggesting that happy people become more satisfied not simply because they feel better but because they develop resources for living well.

Keywords: happiness, life satisfaction, ego resilience, broaden, build.

A large empirical literature shows that people who are happier achieve better life outcomes, including financial success, supportive relationships, mental health, effective coping, and even physical health and longevity. Moreover, prospective and longitudinal studies show that happiness often precedes and predicts these positive outcomes rather than simply resulting from them (for a review of 225 studies, see Lyubomirsky, King, & Diener, 2005).

Little is known about how or why happiness can lead to such a wide range of beneficial outcomes. Fredrickson's (1998, 2001) broaden-and-build theory of positive emotions offers an overarching theoretical explanation by linking the cumulative experience of

momentary positive emotions to the development of resources for long-term success and well-being. We present a study that links day-to-day positive emotions to improvements in life outcomes via growth in resilience.

Broaden-and-Build Theory

The broaden-and-build theory of positive emotions (Fredrickson, 1998; Fredrickson & Cohn, 2008) proposes that positive emotions are evolved adaptations that function to build lasting resources. Unlike negative emotions, which narrow attention, cognition, and physiology toward coping with an immediate threat or problem (Carver, 2003; Cosmides & Tooby, 2000), positive emotions produce novel and broad-ranging thoughts and actions that are usually not critical to one's immediate safety, well-being, or survival. Over time, however, these novel experiences aggregate into consequential resources that can change people's lives. For example, idle curiosity can become expert knowledge, or affection and shared amusement can become a lifelong supportive relationship. Positive emotions forecast valued outcomes such as health, wealth, and longevity because they help build the resources to get there.

Evidence confirms that positive emotions broaden thought-repertoires: Induced positive emotions produce wider visual search patterns, novel and creative thoughts and actions, more

Michael A. Cohn, School of Medicine, University of California San Francisco; Barbara L. Fredrickson, Department of Psychology, University of North Carolina at Chapel Hill; Stephanie L. Brown, Department of General Medicine, University of Michigan; Joseph A. Mikels, Department of Psychology, Cornell University; Anne M. Conway, Department of Pediatrics, University of Pittsburgh.

This research was supported by National Institute of Mental Health Grant MH59615. We thank our colleagues Kimberly Coffey, Sid Tsai, Bethany Kok, and Emma Buchtel for comments on the manuscript, and Daniel Brickman and John Kraemer for statistics consultation.

Correspondence concerning this article should be addressed to Michael A. Cohn, Osher Center for Integrative Medicine, University of California San Francisco, 1701 Divisadero Street, Suite 150, San Francisco, CA 94115-3011. E-mail: cohnm@ocim.ucsf.edu

inclusive social groups, and more flexible goals and mindsets (for reviews, see Ashby, Isen, & Turken, 1999, and Fredrickson & Cohn, 2008). A recent randomized controlled trial of loving-kindness meditation showed that individuals who learn to self-generate feelings of compassion and love also build resources (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). A variety of indirect (Fredrickson, 1998; Fredrickson & Cohn, 2008) and prospective correlational studies (Fredrickson, Tugade, Waugh, & Larkin, 2003; Waugh & Fredrickson, 2006) support this finding.

Positive Emotions and Ego Resilience

In this study we examine the relationship between positive emotions and change in ego resilience. Ego resilience (J. H. Block & Block, 1980; J. Block & Kremen, 1996) is a fairly stable personality trait that reflects an individual's ability to adapt to changing environments. These adaptive responses may include identifying opportunities, adapting to constraints, and bouncing back from misfortune. Ego resilience is related to a range of important life outcomes: fewer behavioral problems in early childhood (Conway & McDonough, 2006), better interpersonal and intrapersonal adjustment across the life span (Klohn, 1996), faster cardiovascular recovery after a laboratory stressor (Tugade & Fredrickson, 2004), and less depression and more thriving after a real-world tragedy (the terrorist attacks of September 11, 2001; Fredrickson et al., 2003).

Positive emotions lead to higher levels of ego resilience in the future (Cohn & Fredrickson, 2009; Fredrickson & Joiner, 2002; Fredrickson et al., in press). Ego resilience also achieves its effects partly by generating positive emotions. When faced with a stressor, people high on ego resilience experience more positive emotions than do their less resilient peers, even though they experience negative emotions at comparable levels. The difference in positive emotions accounts for their better ability to rebound from adversity and stress, ward off depression, and continue to grow (Fredrickson et al., 2003; Ong, Bergeman, Bisconti, & Wallace, 2006; Tugade & Fredrickson, 2004). In this study, we tested whether positive emotions are associated with growth in ego resilience, which in turn predicts subsequent positive emotions.

Although positive emotions and ego resilience are interrelated in multiple ways, ego resilience provides benefits in negative situations as well as positive situations. Thus, ego resilience is a good candidate for testing the hypothesis that positive emotions reach beyond hedonic experience and temporary broadening and ultimately build resources that enable survival and flourishing.

Happiness Unpacked

Happiness is conceptualized as having multiple empirically separable facets, including global life satisfaction, domain-specific satisfaction, positive beliefs about life, and frequent positive emotions relative to negative ones (Diener, Lucas, & Scollon, 2006; Lucas, Diener, & Suh, 1996). Happiness researchers frequently combine these facets to obtain a thorough assessment of overall well-being. In contrast, the broaden-and-build theory concerns the special and distinct role played by positive emotions: Momentary experiences of positive emotions fuel growth and change over time, helping build resources—in the case of this study, skills for identifying opportunities and bouncing back from adversity.¹

When a person is experiencing positive emotions and using such resources to meet life's challenges and opportunities, global life satisfaction can rise. Thus, from the vantage point of the broaden-and-build theory, positive emotions carry more causal weight than does life satisfaction. We test the model articulated here by separately assessing the three constructs and hypothesizing that positive emotions predict increased ego resilience, which in turn predicts increased life satisfaction.

The "build effect" is not conceptualized as an unusual or dichotomous state. People move between the poles of immediate self-preservation and long-term investment, adjusting their attention and effort in response to changing thoughts, feelings, and circumstances. Thus, we predict that everyday experiences of positive emotions will fuel continuing growth in resources; benefits will not be confined to individuals who are at the extremes of happiness or who become happier after the initial assessment.

Similarly, increases in resources should not require an absence of negative emotions. It is true that negative emotions generally oppose the effects of positive emotions and frequently overcome them subjectively (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Derryberry, 1993), but this describes situations (such as those often used in the laboratory) in which positive and negative stimuli compete for attention. If an individual experiences positive emotions during one part of their day and negative emotions during another, there is no reason to believe that their effects will cancel each other out. A vivid example occurs during bereavement: Many people who are grieving report some episodes of positive emotions amid their high levels of negative emotions, and those who do so experience better psychological outcomes (G. A. Bonanno & Keltner, 1997; A. Bonanno, Moskowitz, Papa, & Folkman, 2005).

We also do not predict that the build effect of positive emotions will be matched by an opposing "demolish effect" of negative emotions. People who experience negative emotions may draw on resources they developed in the past, but there is no reason to believe that these resources are used up, unless negative emotions become pathologically intense or chronic. Thus, we additionally predict that (a) negative emotions will not predict resources and life satisfaction as well as positive emotions do, and that (b) the relationship between positive emotions, resources, and life satisfaction will not be reduced in the context of high levels of negative emotion.

Hypotheses

In the current study we use computer-validated diary data to examine the relationships among day-to-day positive emotions, ego-resilience, and global life satisfaction. We test the broaden-and-build theory with two mediational models. The first examines positive emotions as both a result of ego resilience and a predictor of its future increase. The second tests whether positive emotions enhance life satisfaction specifically because they help build ego-resilience. Finally, we look more closely at the role played by

¹ We suspect that resilience grows as people accrue experience thinking optimistically and taking a broadened perspective on their problems, but this speculation is beyond the scope of the current study.

levels of negative emotions over the same period, and at whether stable levels of positive emotions are as effective at producing change as are rising ones.

Hypothesis 1: Daily positive emotions measured throughout the month predict increases in both ego resilience and life satisfaction over the month. Daily negative emotions have no effect.

Hypothesis 2: The relation between baseline ego resilience and ego resilience 1 month later is partially mediated by daily positive emotions. Although life satisfaction is similarly valenced, it will not similarly mediate.

Hypothesis 3: The relation between positive emotions and increased life satisfaction is mediated by increased resilience.

Hypothesis 4: Levels of negative emotions will not affect the associations among positive emotions, ego resilience, and life satisfaction.

Hypothesis 5: The models tested in Hypotheses 1–3 will not be improved by the addition of a variable reflecting change in positive emotions across the month.

Method

Participants

University students were recruited via newspaper ads and posters offering up to \$100 for participation in a month-long study of psychological adjustment. Volunteers responded to background questionnaires and a measure of depression (Center for Epidemiological Studies Depression Scale; Radloff, 1977). We accepted volunteers who were ≥ 18 years old, were in their first or second year of college, were native English speakers, and scored below 24 on the Center for Epidemiological Studies Depression Scale. This cut-off included a wide range of levels of well-being but excluded individuals with a high likelihood of clinical depression.

We randomly selected 120 eligible respondents (out of 214 eligible, 559 total), split equally between men and women. One hundred nine began the study, 98 completed the study, and 86 provided adequate daily responses (21 days out of 28). The final sample was 80.5% White and 59.8% women, mean age = 18.7 years ($SD = 0.65$).

Measures

Daily emotions. Participants used our website to submit daily emotion reports (the modified Differential Emotions Scale: mDES; Fredrickson et al., 2003). Responses were automatically uploaded and time-stamped, which enhances compliance and eliminates the common problem of backdated entries (Stone, Schiffman, Schwartz, Broderick, & Hufford, 2002). Participants rated their strongest experiences of 18 emotions in the past day on a 5-point scale (0 = *not at all* to 4 = *extremely*).² The Positive Emotions subscale consists of amusement, awe, compassion, contentment, gratitude, hope, interest, joy, love, and pride (average of 28 daily alphas = .86). The Negative Emotions subscale consists of anger, contempt, disgust, embarrassment, fear, guilt, sadness, and shame (average $\alpha = .82$).

Ego resilience. Ego resilience was measured with the Ego-Resiliency 89, which taps the ability to flexibly respond to challenging and shifting circumstances (J. Block & Kremen, 1996). Participants responded on a 4-point Likert scale to 14 items, including “I quickly get over and recover from being startled,” and “I enjoy dealing with new and unusual situations” ($\alpha_{T1} = .69$, $\alpha_{T2} = .74$).

Life satisfaction. Life satisfaction was measured using the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), a widely used index that is associated with many positive life outcomes (Lyubomirsky et al., 2005). Participants responded to five items, including “So far I have gotten the important things I want in life,” with a 7-point Likert scale ($\alpha_{T1} = .82$, $\alpha_{T2} = .85$).

All measures were converted to z scores. Two individuals included in the analyses below had scores > 3 SD s from the mean on at least one measure. Recoding their extreme scores to 3 SD does not change any results reported here.

Procedure

Participants visited our lab, where an experimenter explained the significance of the project and the importance of consistent participation. They then completed T_1 questionnaires, including ego resilience and life satisfaction. Participants were instructed to visit our website every evening for 28 days. They logged in and completed the mDES for “the past 24 hours,” followed by other measures not reported here.³ After the final daily entry, participants returned to the website to complete T_2 ego resilience and life satisfaction measures. Participants were paid up to \$100, depending on the completeness of their data.

Results

Hypothesis 1: Do Positive (but not Negative) Emotions Predict Increases in Ego Resilience and Life Satisfaction?

Positive and negative emotion scores were calculated for each day and averaged across the month (positive: $M = 1.95$, $SD = 0.51$; negative: $M = 0.63$, $SD = 0.38$). The two scores were not correlated on any day ($Mdn r = -.05$, $Mdn p = .51$) or in aggregate ($r = .17$, $p = .12$).

Correlations between composite emotion scores and the outcome variables are displayed in Table 1. Positive emotions (PE) predict ego resilience and life satisfaction, and also predict increases over the course of the month, over and above any change predicted by T_1 values. Effect sizes are in the medium-to-large range.

Negative emotions (NE) predict T_2 resilience only ($r = -.22$, $p = .05$). This is smaller than the relationship between T_2 ego resilience and PE, but the difference is only marginally significant ($z = .168$, $p = .09$). Negative emotions do not predict any life

² Reports of emotional average are prone to a variety of recall biases, whereas emotional peaks are recalled more vividly (Fredrickson & Kahneman, 1993; Kahneman, 2003).

³ Participants were randomly assigned to one of three groups that did different daily journaling exercises. Group assignment had no effect on the measures in this article and so is not discussed further.

Table 1
Correlations Between Emotion Indices and Resilience and Life Satisfaction

Variable	Resilience			Life satisfaction		
	Baseline	1 month	Residual	Baseline	1 month	Residual
Positive emotions	.320**	.454***	.217***	.273**	.357***	.146*
Negative emotions	-.165 <i>ns</i>	-.217*	-.085 <i>ns</i>	.164 <i>ns</i>	.083 <i>ns</i>	-.052 <i>ns</i>

Note. Residual correlations are standardized regression coefficients when 1-month score is regressed on emotions and baseline score simultaneously. *ns* = not significant.

* $p < .05$. ** $p \leq .01$. *** $p \leq .001$.

satisfaction scores ($ps > .13$). All estimated effect sizes for negative emotions are small.

Ego resilience and life satisfaction were not correlated at either time point ($r_{T_1} = .14, p = .21; r_{T_2} = .07, p = .54$), but change in ego resilience predicted change in life satisfaction ($\beta = .32, p = .003$).⁴

Hypothesis 2: Do Positive Emotions (but not Life Satisfaction) Partially Mediate the Relation Between Initial and Final Ego Resilience Scores?

We constructed a mediation model in which T_1 ego resilience predicted T_2 ego resilience, with daily positive emotions as a mediator. We used the Sobel test for mediation with bootstrap estimation for coefficients (Preacher & Hayes, 2004). Positive emotions continued to predict T_2 ego resilience ($\beta = .22, p = .001$), as did T_1 ego resilience ($\beta = .74, p < .001$). The indirect pathway— T_1 influences T_2 through positive emotions—was significant ($\beta = .09, p < .01$), indicating that positive emotions partially mediate the relationship between T_1 and T_2 ego resilience.⁵

We assessed life satisfaction as a mediator in place of positive emotions, using life satisfaction at T_1 , T_2 , and their average. In each case, the indirect path was nonsignificant and near zero ($\beta < .01, p > .15$; change in direct path $\leq .01$).

Hypothesis 3: Are Increases in Ego Resilience Responsible for the Relation Between Positive Emotions and Increased Life Satisfaction?

Positive emotions predicted change in life satisfaction ($\beta = .15, p = .03$). To determine whether this is consistent with contributing to life satisfaction specifically by building resources, we tested change in ego resilience as a mediator. T_2 life satisfaction was treated as the outcome, with T_1 life satisfaction as a predictor. Thus, semipartial correlations of other variables with T_2 life satisfaction predict variance above and beyond those predicted by T_1 levels. Positive emotions were an additional predictor, and change in resilience was a mediator.

When the paths through all predictors are taken into account, change in resilience remains significant ($\beta = .15, p = .02$). The direct path from positive emotions to change in life satisfaction becomes nonsignificant ($\beta = .08, p = .22$), but the indirect path through change in resilience is significant ($\beta = .05, p < .01$). This pattern indicates that the relationship of positive emotions to change in life satisfaction is fully mediated by change in resilience.

The relations described here can be illustrated by viewing change in ego resilience across positive emotions quartiles (Figure 1a) and change in life satisfaction across ego resilience change quartiles (Figure 1b).

Hypothesis 4: Do Negative Emotions Reduce the Effects of Positive Emotions?

Although negative emotions were not a significant predictor of change in ego resilience or life satisfaction, they may reduce the predictive value of positive emotions. We tested a model in which the relationship between T_1 and T_2 ego resilience was simultaneously mediated by positive emotions, negative emotions, and their interaction. Positive emotions remained a significant predictor of change in resilience ($\beta = .27, p < .001$). Negative emotions became a significant negative predictor ($\beta = -.17, p = .01$), but there was no significant interaction ($\beta = .10, p = .10$). The indirect path through positive emotions accounted for a significant portion of the relationship between T_1 and T_2 ego resilience ($\beta = .09, p < .01$), but the paths through negative emotions ($\beta = .03$) and through the interaction ($\beta = -.03$) did not ($p \geq .15$). This model was a significant improvement over the model with positive emotions as the sole predictor ($\Delta R^2 = .03; \Delta F = 4.1, p = .02$).

The significant coefficient for negative emotions indicates how strongly they predict low change in ego resilience when PE is held constant at zero (because variables used here are standardized, zero represents the mean score). The interaction term indicates that NE will relate to ego resilience change differently depending on the level of PE. Specifically, when both NE and PE are above zero, the positive interaction term will partly cancel out the NE term. Using the “pick-a-point” strategy (Rogosa, 1980), we determined that the “balance point” is when PE is $\geq .45 SD$ above the sample mean. At that level of PE, an increase in NE no longer significantly predicts a decrease in ego resilience change. In contrast, PE becomes a stronger predictor of ego resilience change at high levels of NE (PE becomes nonsignificant when NE is $> 1 SD$ below the mean). This indicates that high levels of PE reduce the impact of any increase in NE, but high NE does not reduce the impact of PE.

⁴ Here and elsewhere, “change” refers to deviation from the value expected on the basis of T_1 (i.e., the residual). For discussion of this use of change, see Campbell and Kenny (1999, chap. 6).

⁵ We followed Campbell and Kenny’s (1999, p. 158) recommendation to test the reversed model (T_2 predicting T_1). The indirect path coefficient also reversed ($\beta = -.03, p = .30$), consistent with a genuine effect and not a statistical artifact.

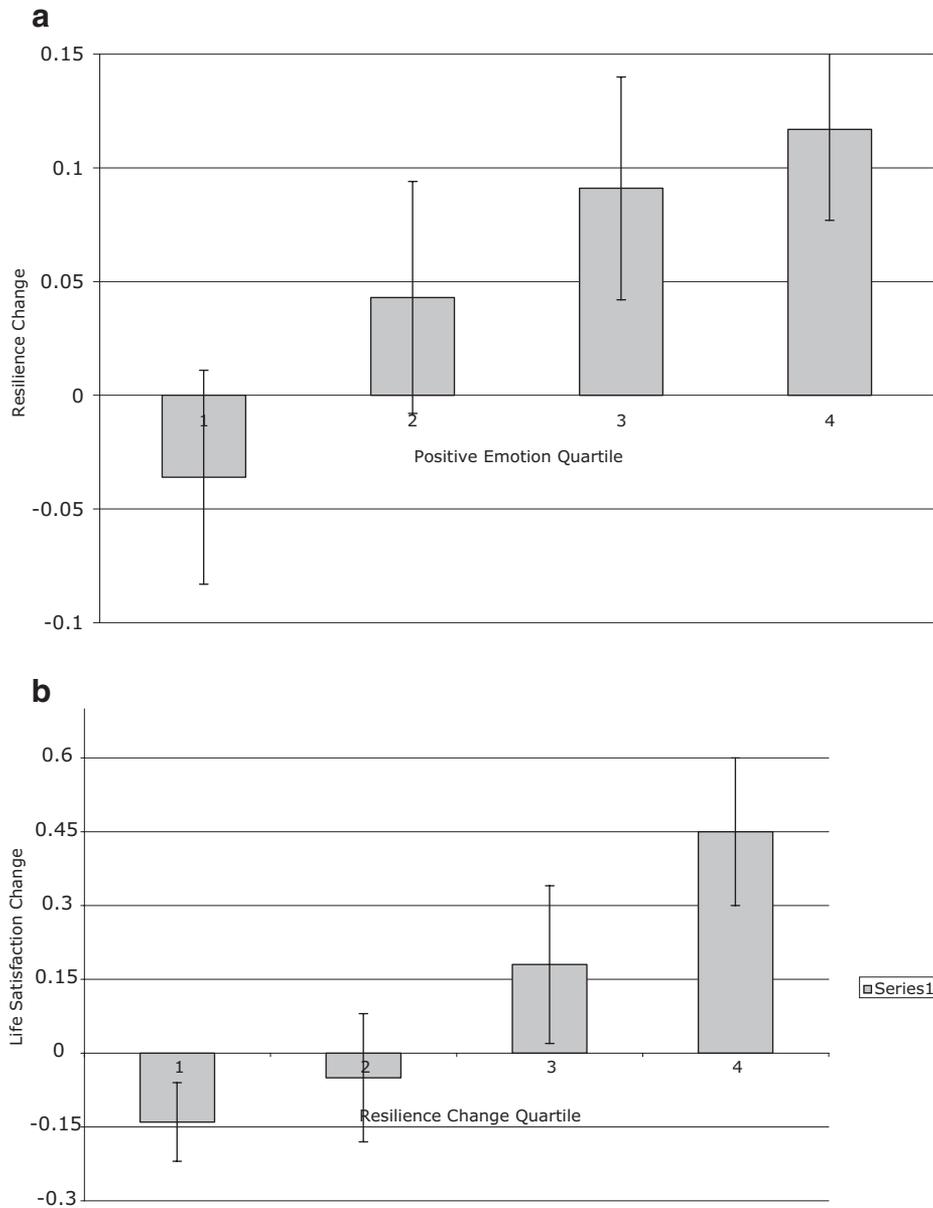


Figure 1. (a) Raw change in ego resilience scores by positive emotion quartiles. (b) Raw change in life satisfaction by ego resilience change quartiles.

We also tested positive emotions, negative emotions, and their interaction as predictors of increases in life satisfaction. Positive emotions remained significant ($\beta = .17, p = .01$), negative emotions remained nonsignificant ($\beta = -.10, p = .15$), and the interaction was nonsignificant ($\beta = .09, p = .19$). This model did not improve over using positive emotions alone ($\Delta R^2 = .01; \Delta F = 1.5, p = .23$).

Hypothesis 5: Are Rising Levels of Positive Emotions Necessary?

We tested whether increases in ego resilience and life satisfaction required not just the presence of positive emotions but also an

increase in positive emotions over baseline. We created a change variable from the Week 4 positive emotions score with Week 1 positive emotions partialled out and repeated the tests described above, using the change variable in place of the aggregate positive emotions variable. Change in positive emotions did not significantly predict baseline, 1-month, or change scores for ego resilience or life satisfaction ($r < .19, p \geq .09$). It also did not have a significant indirect effect in the relationship between T_1 and T_2 ego resilience ($\beta = .10, p = .12$). We replicated these tests again with aggregate positive emotions and change in positive emotions entered simultaneously (despite overlap in predictors, all tolerance scores were $>.78$). The regression coefficients for positive emo-

tions change declined, while aggregate positive emotions remained significant. Thus, it appears that absolute levels of positive emotions matter more than do positive emotions relative to baseline.

Discussion

Why do happier people do better in life? This prospective study strengthens the evidence that positive emotions actively help people create desirable outcomes (Lyubomirsky et al., 2005). As the broaden-and-build theory predicts, participants who experienced frequent positive emotions became more satisfied not simply because they were enjoying themselves, but because they built resources that help deal with a wide range of life's challenges. Daily positive emotions predicted growth in ego resilience, a psychological resource that has proven useful in dealing with both mild and severe stressors (Fredrickson et al., 2003; Ong et al., 2006; Tugade & Fredrickson, 2004). Growth in ego resilience then accounted for the relation between daily positive emotions and increases in global life satisfaction. Although these findings are correlational and cannot fully support the causal direction predicted by the broaden-and-build theory, they are consistent with other findings that positive emotions can build resources (Fredrickson et al., in press; Lyubomirsky et al., 2005).

The finding that positive emotions predict growth better than does life satisfaction is crucial. A wide variety of positive feelings, states, and evaluations predict positive life outcomes (Lyubomirsky et al., 2005), but when momentary positive emotions were disentangled from general life satisfaction, it was the momentary emotions that remained predictive. This very specifically supports the core tenet of the broaden-and-build theory: The short-term cognitive and attentional effects of positive emotions are what lead to gradual, long-term growth. We expect that along with ego resilience, many traits and skills that help people generate positive emotions will lead to broadened outlooks and new resources. In contrast, improvements in material wealth and living circumstances—which increase life satisfaction but produce relatively few positive emotions (Diener, 2007)—will not have these beneficial effects.

These findings also suggest that life satisfaction is more than just the summation of good and bad feelings over time (Kahneman, 1999). Life satisfaction in our sample was correlated with positive emotions but ultimately depended on growth in ego resilience, a multifaceted skill involving emotion regulation, problem solving, and the ability to change perspective—one that goes well beyond the pleasurable emotions that gave rise to it.

Positive and Negative Emotions

Positive emotions also emerged as functionally distinct from an absence of negative emotions. Growth in life satisfaction was predicted specifically by feeling good, not by avoidance of feeling bad. Growth in ego resilience was predicted by both independently, disconfirming our hypothesis that negative emotions would not have an effect. However, it appears that positive emotions at moderately high levels (approximately half a standard deviation) can buffer against the effects of negative emotions. Positive emotions, consistent with their role in grief and stress recovery (G. A. Bonanno & Keltner, 1997; A. Bonanno et al., 2005; Fredrickson et al., 2003), remained a positive predictor no matter how intense

negative emotions became. At time scales as short as 1 month, the typical finding that negative emotions overwhelm positive ones appears to reverse: Positive emotions were the better predictor of whether people built important resources and became more satisfied with their lives, and these benefits persisted even in the midst of negative emotions.

The effects of positive emotions were predicted well by the aggregate level of positive emotions over the month and much less well by the change in positive emotions from baseline. For example, an individual who spent the first half of the month with a score of 3 and the second half with a score of 5 would show the same increase in resilience and life satisfaction as an individual who spent the entire month with a score of 4. This is consistent with our suggestion that the broaden-and-build process responds to ordinary, common experience rather than being restricted to times of unusual positivity or change. Future research on this question should examine the predictive power of change in data sets that cover longer time spans or capture a greater range of emotional experience.

Individuals with depression or other mental illnesses may not exhibit the patterns described above: A person with extremely strong negative emotions may need to relieve them before becoming able to benefit from positive emotions. A person with extremely low positive emotions may show additional benefits from any increase in positive emotions. Our study excluded individuals with clinical or subclinical depression symptoms, and so we may have failed to detect these boundary conditions in our findings. However, early evidence suggests that individuals with mild or moderate depression still benefit from deliberately induced positive emotions (Seligman, Rashid, & Parks, 2006). Future work should investigate more severe depression, as well as other mental illnesses. We speculate that psychopathology interferes with the broaden-and-build process primarily by reducing positive emotions (via anhedonia, cognitive impairment, or strong and frequent negative emotions) but that when positive emotions do arise, they will still be beneficial.

These results help assuage concerns that happiness research endorses a "Pollyanna-ish" denial of the challenging or upsetting aspects of life. Participants with average and stable levels of positive emotions still showed growth in resources (see Figure 1a), even when their days also included substantial negative emotions. Perpetually increasing levels of happiness are not required (see also Fredrickson & Losada, 2005) nor is an unresponsive positivity that blocks out negative experience. This is consistent with the broaden-and-build theory, which views positive emotions and long-term growth as part of everyday human functioning rather than as a rare or exceptional state. Indeed, extreme positive emotions may be less beneficial than would merely high ones in certain domains (Diener, Sandvik, & Pavot, 1991; Oishi, Diener, & Lucas, 2007).

In contrast, the relatively small effects of negative emotions may not remain stable under normal circumstances. Resources such as optimism, physical energy, and supportive relationships may become depleted temporarily when they are used to cope with a stressor, but the underlying beliefs, abilities, and connections are not lost. Again, this pattern may not hold in cases involving prolonged stressors or psychopathology, which can take a toll on resources in forms such as learned helplessness, poor health, and social support burnout. Future work with more distressed popula-

tions will help determine whether this “demolish effect” emerges more clearly at high levels of negative emotions.

Limitations and Future Work

This study was able to go further than was past research in determining what aspects of happiness lead to positive life outcomes. Using a computer-validated diary method, we gathered data on day-to-day positive emotions with greater accuracy than is possible with broad retrospective ratings or paper diaries (Stone et al., 2003). We also elaborated on the functional distinction between experiencing positive emotions and making a general positive evaluation of one’s life: Only in-the-moment positive emotions helped build resources.

This study relied on self-report instruments with demonstrated external validity: The mDES emotions measure correlates well with peer reports (Cohn & Fredrickson, 2009), and ego resilience measured with the Ego-Resiliency 89 predicts important biological markers and life outcomes (Fredrickson et al., 2003; Khlonen, 1996; Tugade & Fredrickson, 2004), as does life satisfaction measured with the SWLS (Lyubomirsky et al., 2005). Our measurement of emotions could be improved if the mDES, which measures peak intensity, was supplemented with a measure of emotion frequency. Because frequency and duration of emotions are recalled less accurately than is peak intensity (Fredrickson & Kahneman, 1993; Kahneman, 2003), this might require more in-depth reporting measures, such as the Day Reconstruction Method (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2005). The relationship between positive emotions and ego resilience may have been inflated if optimism and positive self-perceptions enhanced participants’ impressions of themselves, but in moderation, optimism and positive self-perception are also legitimate predictors of mental health and coping ability (Scheier & Carver, 2003; Taylor & Armor, 1996). Our findings pave the way for future work that incorporates performance tasks, biological measurements, and practical life outcomes, which can further verify the benefits of positive emotions and test their appropriateness for specific, real-world applications.

The study’s primary weakness is its reliance on correlational analysis. Although the repeated-measures data helped support our claims of causality, the next step will be to induce positive emotions consistently, over time. Long-term follow-up assessments will be vital for understanding how durable these resources are, especially if positive emotions later decrease or negative emotions rise. Sampling a population with high baseline negative emotions would help determine whether there is a point at which negative emotions can begin to interfere with the benefits of positive emotions. Finally, future research will benefit from daily measures of mechanisms that may link positive emotions and increased resources, which include broadened thought–action repertoires and improved regulation of stress responses (see Fredrickson & Cohn, 2008). Our findings suggest that resilience is one of these and that increasing positive emotions may be an important target of intervention.

Conclusion

Positive emotions are a powerful source of growth and change, predicting both individuals’ judgments about life and their skills

for living well. The relation between ego resilience scores across 1 month depends partly on the fact that ego resilience generates positive emotions, suggesting an upward spiral in which ego resilience and positive emotions maintain and build on one another. Positive emotions and ego resilience are associated with rising life satisfaction, but life satisfaction itself is static and does not contribute to its own positive feedback loop. In other words, it is not sufficient to appreciate or approve of one’s life in a general way; lived experiences such as joy and interest are what start the process of exploring, learning, connecting, and ultimately building new resources. Those resources can later improve one’s life, offering up new opportunities for enjoyment and resource building. We look forward to further exploring this potential for daily positive emotions to feed a cycle of lifelong growth.

References

- Ashby, F. G., Isen, A. M., & Turken, A. U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review*, *106*, 529–550.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, *5*, 323–370.
- 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.
- Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the origination of behavior. In W. A. Collings (Ed.), *Minnesota symposia on child psychology*. (pp. 39–101). Hillsdale, NJ: Erlbaum.
- Bonanno, A., Moskowitz, J. T., Papa, A., & Folkman, S. (2005). Resilience to loss in bereaved spouses, bereaved parents, and bereaved gay men. *Journal of Personality and Social Psychology*, *88*, 827–843.
- Bonanno, G. A., & Keltner, D. (1997). Facial expressions of emotion and the course of conjugal bereavement. *Journal of Abnormal Psychology*, *106*, 126–137.
- Campbell, D. T., & Kenny, D. A. (1999). *A primer on regression artifacts*. New York: Guilford Press.
- Carver, C. S. (2003). Pleasure as a sign you can attend to something else: Placing positive feelings within a general model of affect. *Cognition and Emotion*, *17*, 241–261.
- Cohn, M. A., & Fredrickson, B. L. (2009). *Continuing benefits from loving-kindness meditation, one year later*. Manuscript in preparation.
- Conway, A. N., & McDonough, S. C. (2006). Emotional resilience in early childhood: Developmental antecedents and relations to behavior problems. *Annals of the New York Academy of Sciences*, *1094*, 272–277.
- Cosmides, L., & Tooby, J. (2000). Evolutionary psychology and the emotions. In M. Lewis & J. M. H. Jones (Eds.), *Handbook of emotions* (pp. 91–115). New York: Guilford Press.
- Derryberry, D. (1993). Attentional consequences of outcome-related motivational states: Congruent, incongruent, and focusing effects. *Motivation and Emotion*, *17*, 65–89.
- Diener, E. (2007, October). *The well-being of planet earth*. Paper presented at the Global Well-Being Forum, Washington, DC.
- Diener, E., Emmons, R. A., Larson, R. J., & Griffin, S. (1985). The satisfaction with life scale: A measure of life satisfaction. *Journal of Personality Assessment*, *49*, 1–5.
- Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: Revisions to the adaptation theory of well-being. *American Psychologist*, *61*, 305–314.
- Diener, E., Sandvik, E., & Pavot, W. (1991). Happiness is the frequency, not the intensity, of positive versus negative affect. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being: An interdisciplinary perspective*. Oxford, England: Pergamon Press.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, *2*, 300–319.

- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*, 218–226.
- Fredrickson, B. L., & Cohn, M. A. (2008). Positive emotions. In M. Lewis, J. Haviland, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed.). New York: Guilford Press.
- Fredrickson, B. L., Cohn, M. A., Coffey, K., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: Positive emotions, induced through meditation, build consequential personal resources. *Journal of Personality and Social Psychology, 95*, 1045–1062.
- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychological Science, 13*, 172–175.
- Fredrickson, B. L., & Kahneman, D. (1993). Duration neglect in retrospective evaluations of affective episodes. *Journal of Personality and Social Psychology, 65*, 45–55.
- Fredrickson, B. L., & Losada, F. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychologist, 60*, 678–686.
- Fredrickson, B. L., Tugade, M., Waugh, C. E., & Larkin, G. R. (2003). 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. *Journal of Personality and Social Psychology, 84*, 365–376.
- Kahneman, D. (1999). Objective happiness. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 3–25). New York: Russell Sage Foundation.
- Kahneman, D. (2003). Experienced utility and objective happiness: A moment-based approach. In I. Brocas & J. D. Carrillo (Eds.), *The psychology of economic decisions: Vol. I. Rationality and well-being*. New York: Oxford University Press.
- Kahneman, D., Krueger, A., Schkade, D., Schwarz, N., & Stone, A. A. (2005). A survey method for characterizing daily life experience. *Science, 306*, 1176–1180.
- Klohn, E. C. (1996). Conceptual analysis and measurement of the construct of ego-resiliency. *Journal of Personality and Social Psychology, 70*, 1067–1079.
- Lucas, R. E., Diener, E., & Suh, E. (1996). Discriminant validity of well-being measures. *Journal of Personality and Social Psychology, 71*, 616–628.
- Lyubomirsky, S. L., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 14*, 803–855.
- Oishi, S., Diener, E., & Lucas, R. (2007). The optimum level of well-being: Can people be too happy? *Perspectives on Psychological Science, 2*, 346–360.
- Ong, A. D., Bergeman, C. S., Bisconti, T. L., & Wallace, K. A. (2006). Psychological resilience, positive emotions, and successful adaptation to stress in later life. *Journal of Personality and Social Psychology, 91*, 730–749.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, and Computers, 36*, 717–731.
- Radloff, L. S. (1977). The CES–D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401.
- Rogosa, D. (1980). Comparing nonparallel regression lines. *Psychological Bulletin, 88*, 307–321.
- Scheier, F. M., & Carver, C. S. (2003). Self-regulatory processes and responses to health threat: Effects of optimism on well-being. In J. Suls & K. A. Wallston (Eds.), *Social psychological foundations of health and illness* (pp. 395–428). Malden, MA: Blackwell.
- Seligman, M. E. P., Rashid, T., & Parks, A. C. (2006). Positive psychotherapy. *American Psychologist, 61*, 774–788.
- Stone, A. A., Shiffman, S., Schwartz, J. E., Broderick, J. E., & Hufford, M. R. (2003). Patient compliance with paper and electronic diaries. *Controlled Clinical Trials, 24*, 182–199.
- Taylor, S. E., & Armor, D. A. (1996). Positive illusions and coping with adversity. *Journal of Personality, 64*, 873–898.
- Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology, 86*, 320–333.
- Waugh, C. E., & Fredrickson, B. L. (2006). Nice to know you: Positive emotions, self–other overlap, and complex understanding in the formation of a new relationship. *Journal of Positive Psychology, 1*, 93–106.

Received February 4, 2008

Revision received November 13, 2008

Accepted January 8, 2009 ■