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When Feeling Bad Can Be Good: Mixed Emotions Benefit Physical Health Across Adulthood

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Abstract

Traditional models of emotion–health interactions have emphasized the deleterious effects of negative emotions on physical health. More recently, researchers have turned to potential benefits of positive emotions on physical health as well. Both lines of research, though, neglect the complex interplay between positive and negative emotions and how this interplay affects physical well-being. Indeed, recent theoretical work suggests that a strategy of "taking the good with the bad" may benefit health outcomes. In the present study, the authors assessed the impact of mixed emotional experiences on health outcomes in a 10-year longitudinal experience-sampling study across the adult life span. The authors found that not only were frequent experiences of mixed emotions (co-occurrences of positive and negative emotions) strongly associated with relatively good physical health, but that increases of mixed emotions over many years attenuated typical age-related health declines.

Keywords

mixed emotions; health; longitudinal data; emotion–health interactions

Traditional models of the effects of emotion on physical health have mostly emphasized the role that the persistent experience of negative emotions plays in the etiology of illness (e.g., O'Donovan et al., in press; Payne, 1999; Selye, 1956; Wilson et al., 2005). More recently, researchers have also begun to focus on the beneficial effects of positive emotions on health (e.g., Cohen & Pressman, 2006; Ong, 2010). By and large, however, the complex interplay between positive and negative emotions in daily experience has been neglected. One notable exception is the coactivation model of health by Larsen, Hemenover, Norris, and Cacioppo (2003). Drawing on findings from the coping and meaning-making literature (e.g., Bower, Kemeny, Taylor, & Fahey, 1998), the model posits that maintaining a mix of positive and negative emotions enhances physical health. Very little research has directly tested postulates from the model, however, and to the best of our knowledge, no research has prospectively examined the link between the persistent experience of mixed emotions and subsequent physical health outcomes. In the present study, we examine the relationship of mixed emotional experiences reported in an experience sampling study to health outcomes across a 10-year period.

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When facing negative daily events, people may choose to suppress negative emotions (Gross & John, 2003) or express them (e.g., Pennebaker, 1997). Although there can be benefits to suppressing or avoiding negative emotions, there can also be drawbacks. There is some evidence that failing to grapple with negative events in everyday life ultimately leads to poor health (Pennebaker, Kiecolt-Glaser, & Glaser, 1988). A recent metaanalysis, in fact, has shown that people who engage in repression as a coping strategy have a higher risk of suffering from cancer and cardiovascular diseases (Mund & Mitte, in press). Larsen et al. (2003) posit a third strategy for dealing with life's difficulties, "taking the good with the bad," in which people find a way to feel good when feeling bad. Under these circumstances, experiencing negative affect alongside positive affect can be beneficial to long-term health because individuals are able to confront and find something positive in life's stressors. In their framework, allowing for positive affect to be experienced concurrently with negative affect prompts individuals to face negative events in life and gain insight into them.

Zautra and colleagues' work on the dynamic model of affect (DMA; Davis, Zautra, & Smith, 2004; Zautra, Reich, Davis, Potter, & Nicolson, 2000) also speaks to this relationship. Namely, the DMA posits that when people are in calm states, they process information from a variety of sources so as to create a balanced and rich assessment of their environments: benefits can be accrued from gaining a full understanding of contexts and experiences. However, when individuals face difficult and uncertain situations, the need to process information in a quick and rapid fashion ultimately takes precedence over any advantages that might result from a more nuanced assessment of a situation. Attention narrows, in other words, so that one can deal with immediate concerns. On a general level, the DMA suggests that difficult life situations will tend to cause emotional experience to be much less complex than comparatively less difficult situations. Yet, research has shown that there are individual differences in 1) the extent to which people experience both affective complexity in the face of negative situations (Zautra, Berkhof, & Nicolson, 2002), and 2) affective synchrony, or overlapping positive and negative emotions (Rafaeli, Rogers, & Revelle, 2007). Theoretically, just as people experience some degree of affective complexity in calm states to gain a fuller understanding of their environments (Davis et al., 2004), it stands to reason that those individuals who are better able to maintain this mixture of positive and negative emotion will be better able to learn from and ultimately process life's ups and downs.

Along these lines, Larsen et al.'s (2003) model suggests that across time, a mix of positive and negative emotions may be optimal for health. For example, when experiencing the loss of a loved one, allowing positive memories to be experienced alongside sadness could potentially lead to a healthier bereavement process (Folkman & Moskowitz, 2000). Given that negative life events such as death of close family members, major injury or illness to close family members, financial hardship, or change in employment situation are common experiences in adulthood (Hobson & Delunas, 2001), more frequent experiences of mixed emotions may theoretically benefit health over time, or as Davis, Zautra, and Smith (2004) note, "The ability to maintain affective complexity in the face of life's inevitable difficulties, including challenges to health, may be a hidden key to resilience across the life span" (p. 1155).

Anecdotally, Spiegel (1998) reported that breast cancer patients who partook in expressive group therapy "came to realize that happiness and sadness are not two poles of one dimension," and subsequently learned to achieve happiness not through eliminating their negative emotions, but by confronting them. In the same vein, Rivkin and Taylor (1999) found that a group of participants who visualized both a stressful event and their emotional reactions to that event reported better subsequent coping, which included greater acceptance of the reality of the event, and more positive reinterpretations of the event. Evidence for the

benefits of mixed emotions also comes from research on resilience in the face of trauma (Bonanno, 2005). Bonanno and Keltner (1997), for example, found that bereaved adults who expressed positive emotions when talking about their recently deceased spouse (during an otherwise negative grieving period) experienced reduced grief over time. More directly related, Coifman, Bonanno, and Rafaeli (2007) have shown that people who demonstrate resilience to loss also show a less severe negative correlation between positive and negative emotions. Although such a finding does not necessarily show that mixed emotions can be beneficial to health, it does suggest that those who are more likely to experience a co-occurrence of positive and negative affect in difficult contexts (e.g., grief) are also more resilient. Finally, Ong, Bergeman, Bisconti, and Wallace (2006) found that experiencing higher levels of positive emotion on high-stress days was related to successful adaption among widows in later life.

Although these studies offer peripheral evidence for the beneficial effects of mixed emotions on global measures of well-being and adaptation, the relationship between mixed emotions and physical health, per se, has never been empirically assessed. Thus, in the present study, we sought to examine whether frequent mixed emotional experiences are prospectively linked to attenuated health decline over time. We hypothesized that (1) mixed emotional experiences would be associated with fewer negative health outcomes, and importantly, (2) increases in the experience of mixed emotions over a time interval of up to 10 years would be associated with attenuated health decline over the same time period.

Method

Participants

Data were collected as part of an ongoing experience-sampling study of emotions in a sample that spans the adult age range (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Carstensen et al., 2011). In the initial sample, 184 participants were recruited by a survey research firm in the San Francisco Bay Area. Participants ranged in age from 18 to 94 years ($M = 55$, $SD = 20.4$); we selected a diverse age range to ensure greater variation in both mixed emotional experience (Ersner-Hershfield, Mikels, Sullivan, & Carstensen, 2008) and health symptoms. Of the sample, 54% were women; 31% were African American and 69% were European American; 41% were blue-collar workers and 59% were white-collar workers. Ethnicity, gender, and socioeconomic status were distributed evenly across age.

Following the initial wave of data collection (1994–1995), subsequent waves of data were obtained at 5-year intervals (Wave 2, 1998–2000; Wave 3, 2004–2005). A total of 193 participants completed Wave 2 and 178 participants completed Wave 3. The sociodemographic composition of the sample did not differ across measurement occasions. To ensure that the distribution of participants remained relatively similar across data collection waves, at each wave, additional participants were recruited to replace those lost to attrition. As reported in Carstensen et al. (2011), in order to address issues with selective attrition, we compared participants who were retained from one wave to the next with those who did not continue participating. As is typical in longitudinal studies, participants who were retained from one wave to the next were more likely to be European American; $\chi^2(1, 218) = 4.21$, $p < .05$, and to have more years of education; $M = 15.31$ versus 14.52, $t(375) = 2.80$, $p < .01$. There were no differences by age, gender, socioeconomic status, or health (all $ps > .20$) in the composition of the samples across waves. In total, the present analyses include 312 unique participants, ranging in age from 18 to 94 ($M = 54.04$, $SD = 22.50$) at their entry to the study. Of the sample, 54 participated in all three waves, 87 participated in two waves, and 171 participated in one wave. More complete demographic information across waves can be found in Carstensen et al. (2011).

Procedure

As reported in Carstensen et al. (2011), following screening by the survey research firm, participants were scheduled for an initial interview at Stanford University or at the offices of the San Francisco-based survey research firm that did the initial recruiting (Wave 1). At Waves 2 and 3, participants who were not able to come to Stanford due to poor health or lack of transportation were interviewed in their homes or in a private meeting room at the San Francisco Public library. Participants were told that the purpose of the study was to examine feelings in everyday life. After obtaining informed consent and demographic information, the participants completed questionnaires that assessed physical health, happiness, and cognitive ability.

Participants were then provided with detailed instructions about the experimental procedures. They were given an electronic pager and were familiarized with the operations of the pager (e.g., how to set it for vibration or sound, how to indicate that they had received the page by pushing a button, etc.) and instructed to complete the emotion response questionnaires each time they were paged. During the week that followed, participants were paged 5 times each day. Paging times were determined by random selections from all possible 10-min intervals between 9 a.m. and 9 p.m., with one constraint: participants were not sampled more than once within a single 20-min period. At the end of each day, participants returned the five completed response sheets by mail in preaddressed stamped envelopes, allowing us to monitor responses during the data collection period and assure that participants adhered to the experimental protocol. Participants were encouraged to call the laboratory if procedural questions or problems arose and periodic calls were made to participants as well as to ensure that they were not having any procedural or technological difficulties. After participants completed the week-long experience-sampling data collection, they returned to the laboratory for a follow-up interview, at which time they were debriefed and paid for their participation.

Materials

Emotion sampling booklet—Participants rated the degree to which they were feeling each of 19 emotions using a 7-point scale that ranged from 1 (*not at all*) to 7 (*extremely*). The list of emotions included 8 positive emotions (happiness, joy, contentment, excitement, pride, accomplishment, interest, and amusement) and 11 negative emotions (anger, sadness, fear, disgust, guilt, embarrassment, shame, anxiety, irritation, frustration, and boredom).[1] Participants completed the emotion sampling booklet 35 times (5 random times per day over 7 consecutive days). We aggregated across positive emotions and negative emotions for further analyses. Mean values of positive and negative emotions were moderately to highly stable from one wave to the next ($r = .57$ to $.76$, all ps $< .001$).

Cornell Medical Index Health Questionnaire (CMI)—The CMI (Brodman, Erdmann, & Wolff, 1956) is a widely used index of health symptoms. Participants reported whether they have recently experienced each of several symptoms across many domains of physical illness. For the purposes of this study, we computed a more specific index of age-related physical illness based on participants' total number of symptoms (of a possible 40) from the sensory, cardiovascular, musculoskeletal, and genitourinary systems. We chose these bodily systems because they are known to show significant variation and deterioration with age (Costa & McCrae, 1980; Weiss, Boyd, Qu, Wolf, & Leff, 2007). An example item for the sensory system is "Are you hard of hearing?" for the cardiovascular system "Do you have

[1]We used three more negative emotion items than positive emotion items because as suggested by previous research, there may be less variability in the experience of daily negative affect (Eid & Diener, 1999). By sampling more negative emotion items, we were able to obtain sufficient variability in negative affect ($SD = 0.54$) to examine bivariate correlations.

pains in the heart or chest?" for the musculoskeletal system "Are your joints often painfully swollen?" and for the genitourinary system "Do you sometimes lose control of your bladder?" Participants completed the CMI on three separate occasions, immediately prior to each experience-sampling week.

Results

Overview

We first report how we derived our index of mixed emotions from the repeated emotion ratings. Next, we report how we calculated change over time in mixed emotions, positive emotions, negative emotions, and health. We used stepwise multiple regression analyses to test our main hypotheses. To examine our first hypothesis that mixed emotions is negatively associated with health decline, we regressed our index of health decline onto our index of mixed emotions. To examine our second hypothesis that increases in mixed emotions is associated with attenuated health decline over time, we regressed change in health over time onto change in mixed emotions over time. For both analyses, we included age, positive affect, and negative affect at Step 1 as covariates.

Operationalizing Mixed Emotions

Following previous research (Carstensen et al., 2000; Ong & Bergeman, 2004), for each participant in each wave of data collection, we computed a mean rating of all positive emotions and a mean rating of all negative emotions (see above for list of positive and negative emotions) for each of the 35 sampling occasions. For each of the three waves, we then computed a Pearson's *r* correlation between the mean positive emotion rating and mean negative emotion rating across the 35 sampling occasions for each person. The correlation between positive and negative affect is our index of mixed emotions. On average, *r* values were negative (Mean $r = -.38$, range from −.85 to .86), indicating that positive and negative emotions *typically* do not co-occur. However, note that there was substantial variation between participants. Accordingly, positive *r* values indicate that positive and negative emotions were more likely to co-occur. Because the outcome variable was a correlation coefficient, we computed a Fisher's *r-to-z* transformation on each participant's *r* value for subsequent regression analyses (Hays, 1973; Rosenthal, 1991). The index of mixed emotions was moderately stable across time ($r = .42$ and .33, $p < .001$).[2]

Operationalizing Change Across Time

Change across the three time intervals of data collection was computed with hierarchical linear modeling (HLM) using HLM software (Bryk & Raudensbush, 1992). Only data from the 141 participants who completed at least two waves were included in these analyses. At Level 1 (the within-person level), we entered our index of mixed emotions (*r-to-z*-transformed values) as the dependent variable and Time as the independent variable to compute change in mixed emotions over time for each person. We did not enter any predictors at Level 2 (the between-person level). Across participants, mixed emotions significantly increased with time ($b = .05$, $SE = .02$, $t(140) = 2.00$, $p < .05$), a finding that we

[2]We also tested alternative methods to derive the index of mixed emotions. First, we performed analyses in which we adjusted for individual variation in reporting styles. To adjust for differences in means, we within-subject centered positive and negative emotion scores at each sampling occasion by subtracting each participant's positive and negative emotion ratings from their mean rating of all emotions across the 35 measurement occasions before calculating the within-person correlation. To adjust for differences in dispersion, we calculated each person's *SD* on a separate global personality index and included this as a covariate in our analyses. Second, we used multilevel modeling to derive an index of covariation between positive and negative emotion ratings for each person, comparable to Rafaeli et al. (2007)'s method. Here, for each individual, we saved the slope of positive emotions predicting negative emotions. We reran our main analyses with these two alternative indices of mixed emotions. For both indices, we found the same positive association between mixed emotions and health.

have discussed in previous work (Carstensen et al., 2011; Ersner-Hershfield et al., 2008). We then computed each person's change in health over time score by entering physical illness symptoms as the dependent variable and Time as the independent variable. As expected, physical symptoms significantly increased over time on average ($b = .54$, $SE = .17$, $t(140) = 3.28$, $p < .05$). We also computed change over time scores for positive and negative emotions. Across participants, we found that positive and negative emotions did not change over time ($p > .05$).[3] We then used individuals' change in mixed emotions, positive emotions, and negative emotions as predictor variables and change in health as the dependent variable to test our second hypothesis in the following section. Table 1 depicts the mean levels and change across waves for mixed emotions, positive emotions, negative emotions, and health symptoms, as well as correlations with age.

Are Mixed Emotions Associated With Fewer Negative Health Outcomes?

First, to assess whether mixed emotions were associated with physical health, we regressed participants' overall CMI physical health symptoms (i.e., total number of physical symptoms in the four subsystems averaged across time intervals) onto their mixed emotions index averaged across time intervals. Because we were interested in the unique effects of mixed emotions above and beyond the effects of positive emotions, negative emotions, and age, in the first step we included average level of positive emotions across time, average level of negative emotions across time, and age at entry as covariates in the overall regression. In the second step, we added the mixed emotions index. Results are shown in Table 2. Replicating previous research, there was a trend for positive emotions to be associated with fewer health symptoms, while age and negative emotions were associated with more health symptoms. Controlling for positive emotions, negative emotions, and age at entry, results indicated that higher levels of mixed emotions were associated with fewer health symptoms (= −.14, $t = -2.70$, $p < .01$; see Figure 1A). Results remain significant when outliers (participants who are more than 3 *SDs* above the mean on mixed emotions) are excluded. Thus, mixed emotions account for health symptoms over and above mean levels of positive and negative emotions.

Are Increases in Mixed Emotions Associated With Attenuated Health Decline?

Second, we examined whether increases in the experience of mixed emotions were associated with attenuated health decline. In this case, we regressed each person's change in health score onto each person's change in mixed emotions score. In a first step, we controlled for changes in positive emotions, changes in negative emotions, and age at entry. In a second step, we added change in mixed emotions (see bottom of Table 2). The more an individual's experience of mixed emotions increased over time, the less their health declined over the same time interval (= −.17, $t = -2.13$, $p < .05$; see Figure 1B). Change in negative emotions did not predict change in health symptoms; there was a trend for increases in positive emotions to predict less health decline (Table 2).

Discussion

The role that mixed emotions may play in physical health outcomes has until now remained relatively unexplored. Larsen and colleagues' (2003) coactivation model of health suggests that when navigating life's ups and downs, a strategy of "taking the good with the bad" may be optimal for physical health outcomes. Such a strategy may allow individuals to better

[3]Note however, that positive and negative emotions were correlated with age at entry (see Table 1), which is consistent with our previous findings (Carstensen et al., 2011). The finding of no relationship between mixed emotions and wave is probably due to the fact that we are narrowing in on a 10-year span, which makes it less likely to find age associations than in a cross-sectional sample spanning 70 years or more.

confront adversity by finding meaning in negative events (Folkman & Moskowitz, 2000). Accordingly, we maintain that frequent mixed emotional experiences may actually be beneficial for one's physical health. Drawing on experience-sampling data from adults across the life span, we found that increased experiences of mixed emotions (greater likelihood that positive and negative emotions co-occur) were associated with fewer physical health symptoms, even when taking into account the effects of positive and negative emotions alone. Notably, for the first time, we showed that an increase of mixed emotions over time was linked to less health decline over time.

Limitations

This study relied on subjective, albeit very detailed, reports of health symptoms as opposed to objective reports such as medical diagnoses. However, subjective health ratings are usually closely related to objective health status as assessed by physicians (Pendleton et al., 2004) and are typically independent, strong predictors of quality of life, morbidity, and mortality (e.g., Helmer, Barberger-Gateau, Letenneur, & Dartigues, 1999). Nevertheless, future research should attempt to examine whether the relationship between mixed emotions and physical health persists when using objective measures of health status.

Although our results demonstrate a link between mixed emotions and physical health, the exact mechanism through which this relationship occurs is currently unknown. Previous research has found that positive emotions in middle-aged men and women are associated with reduced neuroendocrine and inflammatory cardiovascular activity, and less physiological stress response after mental stress testing in the laboratory (Steptoe, Wardle, & Marmot, 2005). Thus, it is possible that relatively frequent mixed emotional experiences operate on a similar mechanism, such that the co-occurrence of positive emotions mitigates the maladaptive physiological impact of negative emotions. Future experimental and longitudinal research utilizing physiological measures of emotional reactivity is necessary to test such a hypothesis.

Furthermore, Larsen et al.'s (2003) coactivation model of health posits that mixed emotions may be particularly helpful during life's toughest times: allowing for positive emotion to be experienced alongside negative emotion prompts individuals to face negative events in life and process them. In the present study, we focused on experience-sampling reports over a 10-year time period, and accordingly, we do not know for certain what types of broad-level experiences participants were undergoing when they were reporting their emotions. Our analysis thus represents a conservative test of the coactivation model. Future work should attempt to examine the exact contexts under which people experience mixed emotions to determine whether frequent mixed emotional experiences in the face of difficult times tend to benefit health even more so than experiencing mixed emotions in the absence of negative events.

Another unresolved issue concerns the temporal course of the mixed emotions that participants in our study experienced. Experience-sampling comes much closer to assessing in-the-moment affect than other assessment techniques, such as retrospective monthly or daily reports. Yet, it is still unclear in the current study whether participants' responses reflected their overall assessment of the psychological moment that they just experienced, or if their reports are indicative of the blends of emotions that they were actually experiencing upon being paged. It is possible that individuals could experience oppositely valenced emotions in a sequential fashion that oscillates so rapidly that it appears as if it is a mixed experience. Notably, Larsen and McGraw (2011) recently demonstrated that when using in-themoment rating scales, individuals could in fact experience happiness and sadness simultaneously. In terms of health outcomes over time, it may not matter whether emotions

from opposing valences occur simultaneously or sequentially, but further research needs to be conducted to determine whether such time courses are more or less optimal.

There may also exist third variables that could be related to or account for additional variance in the relationship between mixed emotions and attenuated health declines. Rafaeli, Rogers, and Revelle (2007), for example, have found that there are stable individual differences in the extent to which people experience mixed emotions, and that one predictor of *affective synchrony* (or the tendency to experience mixed emotions regularly) is possessing an integrated self-concept (Showers, 1992). In addition to individual differences, future research should attempt to examine how group-level moderators of the tendency to experience mixed emotions, such as culture, influence the association between increased mixed emotions and attenuated physical health decline.

For example, a separate body of work has looked at cultural differences in how emotion may influence physical health (e.g., Consedeine, Magai, Cohen & Gillepsie 2002; Curhan et al., under review; Miyamoto & Ryff, 2011). Miyamoto and Ryff (2011) observed that mixed emotions are associated with fewer health problems in a Japanese sample. The specific types of positive and negative affective states examined in Miyamoto and Ryff differed from those assessed in the present study, thus preventing direct comparisons; however, future research is needed that considers specific positive and negative states that are associated with better and worse health outcomes across cultures. Miyamoto, Uchida, and Ellsworth (2010) found that cultural differences between East Asians and Americans in mixed emotions were specific to pleasant events. Thus, future work comparing mixed emotional experiences across cultural contexts may help determine the underlying processes linking mixed emotional experiences to health. The question that remains is: do apparent benefits of mixed emotions result from finding a way to feel good when feeling bad, feeling bad when feeling good, or some combination of the two?

Moreover, the findings from the current research may have implications for coping with difficult times in life, such as the death of a spouse or loved one. Although it focuses on mental health outcomes and not necessarily physical ones, Stroebe and Schut's (1999) dual process model of coping with bereavement is highly relevant. They hypothesize that healthy coping involves individuals alternating between loss-oriented strategies, such as working through their grief, and restorationoriented strategies, such as denying their grief and focusing on new, positive things in their lives. They theorize that attending solely to one strategy and not the other may be detrimental to the coping process, but that taking a balanced overall approach, and oscillating between the negative and the positive, may be the healthiest form of grieving.

In sum, the present study is the first to use three waves of experience sampling data across 10 years to show a positive relationship between mixed emotions and physical health. Our findings lend strong support to the postulate that mixed emotions may benefit physical health. Thus, encouraging individuals to "take the good with the bad" may be a useful strategy that is ultimately linked with preserved health over time.

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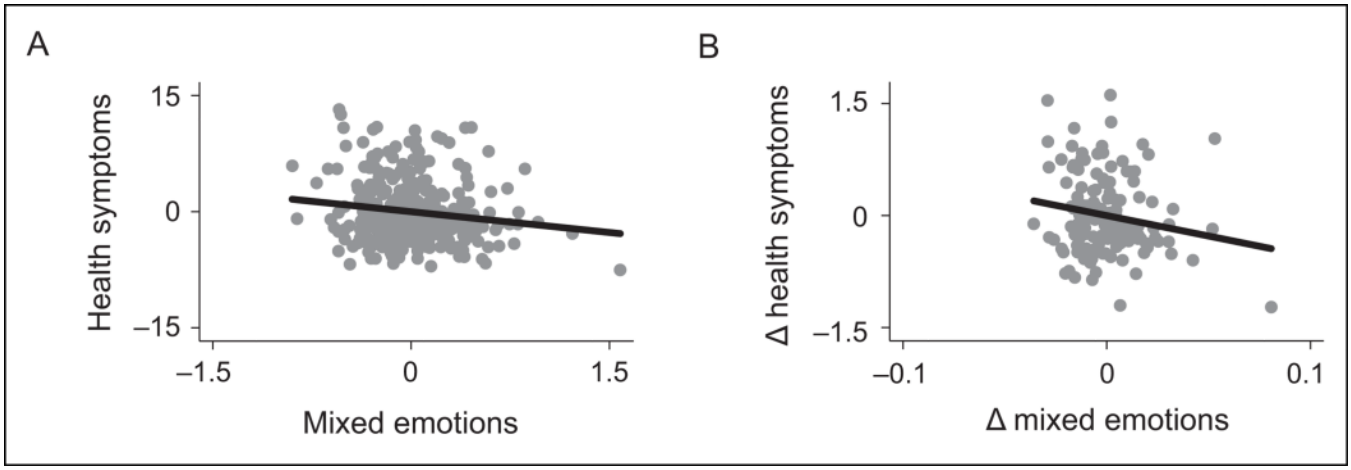

Figure 1.
Partial plots showing relationship between mixed emotions and physical health symptoms, controlling for age, positive emotions, and negative emotions. (A) Average mixed emotions (Fisher's *r*-to-*z* transformation of Pearson's *r* correlation between aggregates of positive and negative emotions) are negatively associated with average physical health symptoms. (B) Changes in mixed emotions over time (hierarchical linear modeling [HLM] coefficient indicating change in mixed emotions over waves of participation) are negatively associated with changes in health symptoms over time (HLM coefficient indicating change in health symptoms over waves of participation).

Table 1

Descriptives and Age Correlations of Central Study Variables

	Mean	*SD*	Correlation With Age at Entry
Mean levels (aggregated across waves)[a]			
1. Mixed emotions (*r*-to-*z*)	−.39	.35	.22***
2. Positive emotions	3.60	1.03	.23***
3. Negative emotions	1.64	.55	−.11*
4. Physical health symptoms	6.63	4.64	.46***
Change by wave[b]			
1. Mixed emotions (*r*-to-*z*)	.050*	.026	.21*
2. Positive emotions	.015	.107	−.07
3. Negative emotions	.027	.041	−.03
4. Physical health symptoms	.542*	.567	.37***

*** $p < .001$

* $p \leq .05$.

[a] Full sample ($N = 312$).

[b] Significance tests for mean-level change are from hierarchical linear modeling (see text). Only participants with at least two waves of data are included ($n = 141$).

Table 2

Results of Regression Analyses Predicting Mean Levels and Changes Over Time in Health Symptoms

Predictor	β	*t*	*p* Value	ΔR²
Predicting mean physical health symptoms[a]				
Step 1				.226***
Age at entry	.49	9.39	.001	
Positive emotions	−.07	−1.32	.188	
Negative emotions	.11	2.16	.032	
Step 2				.018**
Age at entry	.52	9.86	.001	
Positive emotions	−.09	−1.81	.072	
Negative emotions	.11	2.21	.028	
Mixed emotions (*r*-to-*z*)	−.14	−2.70	.007	
Predicting change in physical health symptoms across waves[b]				
Step 1				.162***
Age at entry	.36	4.60	.001	
Change in positive emotions	−.15	−1.87	.063	
Change in negative emotions	.06	.77	.445	
Step 2				.027*
Age at entry	.40	5.00	.001	
Change in positive emotions	−.13	−1.72	.089	
Change in negative emotions	.03	.39	.694	
Change in mixed emotions (*r*-to-*z*)	−.17	−2.13	.035	

*** $p < .001$

** $p < .01$

* $p \leq .05$

[a] Full sample ($N = 312$).

[b] Sample with at least two waves of data ($n = 141$).