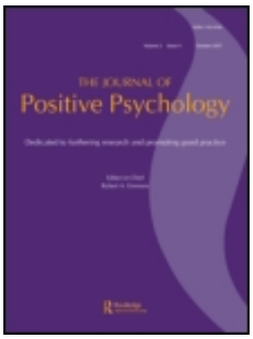

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How to increase and sustain positive emotion: The effects of expressing gratitude and visualizing best possible selves

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Abstract
A 4-week experimental study ($N = 67$) examined the motivational predictors and positive emotion outcomes of regularly practicing two mental exercises: counting one's blessings (''gratitude'') and visualizing best possible selves (''BPS''). In a control exercise, participants attended to the details of their day. Undergraduates performed one of the three exercises during Session I and were asked to continue performing it at home until Session II (in 2 weeks) and again until Session III (in a further 2 weeks). Following previous theory and research, the practices of gratitude and BPS were expected to boost immediate positive affect, relative to the control condition. In addition, we hypothesized that continuing effortful performance of these exercises would be necessary to maintain the boosts (Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005a). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, *9*, 111–131). Finally, initial self-concordant motivation to perform the exercise was expected to predict actual performance and to moderate the effects of performance on increased mood. Results generally supported these hypotheses, and suggested that the BPS exercise may be most beneficial for raising and maintaining positive mood. Implications of the results for understanding the critical factors involved in increasing and sustaining positive affect are discussed.

Keywords: *Affect; gratitude; possible selves; happiness interventions*

Introduction

Growing evidence suggests that, beyond making people feel good, the experience of positive emotions such as joy, happiness, and contentment holds numerous social, intellectual, and physical benefits for the individual (Fredrickson, 2001; Lyubomirsky, King, & Diener, 2005). Furthermore, most people around the world report wanting to feel happier (Diener, 2000; Diener, Suh, Smith, & Shao, 1995). Enhancing people's levels of positive emotion thus appears to be an important empirical objective. In this paper, we investigate how positive affect can be increased and sustained over time.

Although the psychological literature is replete with experimental inductions of positive mood, the majority of studies manipulate affect temporarily, and typically with the aim of observing the effects of the mood manipulation upon other, more central dependent variables. Thus, the mood induction per se is not usually the focus of the study, and the factors that make positive mood inductions more or less effective and persistent are not examined. Furthermore, researchers know very little about how people enhance their positive moods in their daily, naturalistic settings (see Tkach & Lyubomirsky, in press) and whether habitual mood boosting strategies lead to recurring experiences of positive affect.

A few intervention studies aimed at raising global happiness provide clues into some of the factors that predict increases and maintenance of positive emotions. For example, Fordyce (1977, 1983) trained undergraduates in a set of 14 ''fundamental'' techniques (e.g., spend time socializing, become present-oriented, stop worrying, etc.) as part of their course curriculum. Those instructed to implement the suggested techniques showed significant happiness boosts several weeks later relative to control participants, and a subset of students followed-up a year or more after the study reported sustained happiness increases (Fordyce, 1983, Study 7). Many of the 14 fundamentals undoubtedly provided participants with valuable tools to use in increasing positive emotions (e.g., by engaging in positive thinking) and decreasing negative ones (e.g., by stopping worrying). Furthermore, Fordyce found that some of the 14 strategies were more effective than others and that their effectiveness was moderated by person–strategy ''fit.''

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More recent studies have been successful at enhancing positive mood and well-being through induction of habitual activities, such as ''counting one's blessings,'' committing acts of kindness, identifying and using signature strengths, remembering oneself at one's best, and working on personal goals (Emmons & McCullough, 2003; Seligman, Steen, Park, & Peterson, 2005; Sheldon, Kasser, Smith, & Share, 2002). These studies have revealed a number of factors that play a role in the success of any mood-enhancing activity. For example, increases in well-being are highest when the activity fits the person's interests and values and when it is performed neither too frequently nor too seldom.

Lyubomirsky, Sheldon, and Schkade (2005a) have developed a ''sustainable happiness'' model characterizing the dynamics of the process of increasing and sustaining well-being (see also Sheldon & Lyubomirsky, 2004, in press). Relevant to the present study, they describe a number of critical factors that play a role in the enhancement and maintenance of positive emotion. First, they propose that, to sustainably increase well-being, appropriate strategies and practices must be performed with effort and habitual commitment (e.g., Seligman et al., 2005). This notion is consistent with findings that the pursuit of personal goals boosts well-being only if the goals are actually achieved (Brunstein, 1993; Sheldon & Kasser, 1998). Obviously, if an individual desires to feel happier and more joyful but does not exert dedicated effort to regularly perform a relevant mood-enhancing strategy, he will see few or no results. In the current experiment, we asked participants to keep performing one of several affect-boosting exercises, and then measured how conscientiously they did it.

Another important variable within the sustainable happiness model, consistent with Fordyce's (1983) results, is the notion of *fit*. A mood-inducing exercise may or may not fit with a particular individual's personality, motives, strengths, or needs. In the present study, we considered the fit issue by assessing the extent to which people experience initial ''self-concordant motivation'' (SCM; Sheldon & Elliot, 1999) with respect to the particular exercise to which they are assigned.

As defined by Sheldon and colleagues (Sheldon & Elliott, 1999; Sheldon & Houser-Marko, 2001), self-concordant goals are ones perceived to represent one's true values and interests, rather than representing internal and external pressures that have not been assimilated into the self. As assessed with respect to an assigned exercise, SCM thus provides a means for determining which exercises are inherently more engaging to participants. If participants assigned to do one exercise feel more SCM after the first session than those assigned to do some other exercise, then we might conclude that the first exercise is relatively more interesting, challenging, and meaningful to them.

Assessing SCM affords two other advantages besides affording a means to evaluate the initial appeal of various assigned exercises. First, it provides a way to predict regular, sustained effort towards the exercise, which, as discussed earlier, plays a critical role in producing increases in happy mood. Past goal research has shown that SCM predicts a wide variety of effort and performance outcomes (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001). Based on these findings, we expect initial rated SCM to predict more sustained performance of whatever exercise is assigned. Second, assessing SCM allows us to consider the moderating effects of fit on changes in mood. Research has shown that perceived fit between the self and a given activity boosts the effects of success in that activity on mood and well-being (Diener & Fujita, 1995; Fordyce, 1977, 1983; Sheldon & Elliot; 1999; Sheldon & Kasser, 1998). In other words, doing well in an activity is more satisfying if the activity is one that is deeply important to the self. Thus, we expect rated SCM to moderate the effects of exercise frequency on changes in affect.

In sum, we considered SCM in three different ways in this research: (a) as a characteristic of the assigned exercises, reflecting the relative degree to which participants are initially engaged in them; (b) as an individual difference predictor of exercise frequency on success; and (c) as a measure of person–exercise fit, expected to moderate the relationship between exercise frequency and changes in affect. Notably, Sheldon and Elliot (1999) found support for the last two of these hypotheses in a longitudinal study of personal goals.

As discussed above, Fordyce (1983) showed that not every mood-boosting behavior benefits every individual. Thus, it is important to consider and contrast the general effectiveness of several possible mood-boosting strategies. Which ones work best for the majority of people? In the current study, we randomly assigned our participants to perform one of two promising mental exercises (expressing gratitude or visualizing best possible selves) as well as a third exercise (focusing on daily details), which was expected to be less engaging and impactful and was used as a placebo control condition. Theory and research suggests that counting one's blessings and imagining one's optimal future self should produce reliable increases in positive mood. However, the relative extent to which people find each of these exercises attractive to perform, or sustainably effective in boosting mood, is unclear and thus was investigated in the current study.

Expressing gratitude

Expressing gratitude for life's blessings (a sense of wonder, thankfulness and appreciation; Emmons & Shelton, 2002) is likely to elevate positive affect for a number of reasons. Grateful thinking fosters the savoring of positive life experiences and situations, so that people can extract the maximum possible satisfaction and enjoyment from their circumstances. Indeed, counting one's blessings may directly counteract the effects of hedonic adaptation (Brickman & Campbell, 1971; Kahneman, 1999), by preventing people from taking the good things in their lives for granted (Lyubomirsky, Sheldon, et al., 2005a). In addition, the ability to appreciate one's life circumstances and situations may also be an adaptive coping strategy by which people positively reinterpret problematic life experiences (Fredrickson, Tugade, Waugh, & Larkin, 2003). The expression of gratitude is also said to stimulate moral behavior, such as helping, and to help build social bonds (McCullough, Kilpatrick, Emmons, & Larson, 2001). Finally, the practice of gratitude is likely incompatible with negative emotions, and thus may inhibit feelings of envy, bitterness, anger, or greed (McCullough, Emmons, & Tsang, 2002).

Recent experiments have shown that practicing grateful thinking on a regular basis can enhance positive affect and other measures of well-being (Emmons & McCullough, 2003; Lyubomirsky, Tkach, & Sheldon, 2005c). In three experiments, Emmons and McCullough (2003) instructed participants to engage in self-guided exercises involving ''counting their blessings'' either on a weekly basis for 10 weeks or on a daily basis for 2 or 3 weeks. Control participants, by contrast, focused their attention on daily hassles, downward social comparisons, or routine life events. During the intervention, those in the gratitude group reported higher positive affect (in the two daily studies) and physical well-being (in the weekly study) than those in the comparison groups. Lyubomirsky, Tkach, et al. (2005c) similarly found that students who expressed gratitude once a week (but not three times a week) manifested short-term increases in well-being from before to after the intervention. However, the role of factors that may have contributed to the success of the intervention, such as participants' commitment to the gratitude exercise or their perceived person–exercise fit, was not examined in any of these studies.

Visualizing best possible selves

The second mental exercise assigned to students in the present study was to set aside time to visualize and write about their ''best possible selves.'' We chose this activity as one of our two target strategies because previous research has consistently shown that disclosive writing has numerous benefits for well-being, health, and emotional adjustment (see Frattaroli, 2005; Smyth, 1998, for reviews). Possible selves have been defined as idiographic representations of goals (Markus & Nurius, 1986), encompassing all of the futures that people can imagine for themselves (their ''most cherished self-wishes''; Allport, 1961). Writing about one's possible selves is thus likely to improve self-regulation because it allows an opportunity to learn about oneself, to illuminate and restructure one's priorities, and to gain better insight into one's motives and emotions. Writing about one's life goals may also be beneficial because it can reduce goal conflict (Pennebaker, 1998), as well as bring greater awareness and clarity to one's priorities, motivations, and values (Emmons, 1986; Little, 1989; Omodei & Wearing, 1990). Thus, this exercise may serve to integrate life experiences in a meaningful way and allow the person to gain a feeling of control (Lyubomirsky Sousa & Dickerhoof, 2005b; Roberts, Dutton, Spreitzer, Heaphy, & Quinn, in press). Finally, imagining success at one's life goals can improve performance (Pham & Taylor, 1999), boost psychological adjustment (Rivkin & Taylor, 1999), and bring to bear a variety of benefits associated with positive thinking (Fordyce, 1983). Ultimately, many of these benefits are likely to contribute to increased and sustained positive affect.

Supporting these ideas, King (2001) asked participants to write narrative descriptions of their best possible future selves for 20 minutes during each of four consecutive days. The results showed that, relative to writing about other topics, writing about best possible selves was associated with a significant immediate increase in positive mood, with an increase in subjective well-being 3 weeks subsequent to the intervention, and with decreased illness 5 months later. Again, however, other factors contributing to the effectiveness and sustainability of the positive emotion increases were not identified.

The present study

A 4-week longitudinal study was conducted to examine the motivational predictors and positive emotion outcomes of practicing two happiness strategies: expressing gratitude and visualizing best possible selves. In a control condition, participants merely thought about the details of their day. Following previous theory and research, our primary hypothesis (Hypothesis 1) was that performing a gratitude exercise or a BPS exercise would immediately boost positive affect, relative to the neutral comparison condition. In addition, following

Hypothesis 2, gratitude and BSP participants were expected to be more motivated to continue doing their assigned exercise, that is, to express higher SCM with respect to these exercises. However, no specific predictions were made regarding which of these two strategies is more motivating in the short term, and more effective in the long term, relative to the other.

Furthermore, we tested several propositions of the self-concordance model (Sheldon, 2004; Sheldon & Elliot, 1999) and the sustainable happiness model (Lyubomirsky, Sheldon, et al., 2005a; Sheldon & Lyubomirsky, 2004). As our third hypothesis, we expected SCM to predict whether participants continue to perform the exercise or not, after the initial session (Hypothesis 3). Simply put, if a person finds the exercise initially enjoyable and meaningful, she is more likely to keep doing it. Our fourth hypothesis was that continuing (vs. not continuing) to carry out the exercise determines whether the initial mood boost can be sustained (Hypothesis 4). In other words, a person's exercise-inspired mood boost will not last if he does not persist at his efforts in the exercise. Finally, we predicted that SCM would moderate the effects of performing the exercise on sustained positive emotion (Hypothesis 5). That is, doing an exercise should be most beneficial if it is felt to fit a person's interests, traits, and values.

Method

Participants and procedure

Participants were 67 introductory psychology students at the University of Missouri, 17 men and 50 women, who signed up on-line for the study.[1] Fifty-seven were Caucasian and 10 were African-American, Hispanic, or Asian. Initially, participants attended small-group laboratory sessions in which they completed a mood questionnaire, performed a mental exercise, completed a second mood questionnaire, then rated their motivation to keep engaging in the assigned exercise in the future. Participants also completed on-line surveys approximately 2 weeks later and 4 weeks later, in which they again reported their mood and also rated whether and to what extent they were continuing to perform the exercise. The latter two assessments were later combined to represent the sustained effects of the manipulations.

Exercises

Participants were randomly assigned to do one of three exercises. All three exercises were introduced verbally by the experimenter, and were prefaced with the statement: ''In this study we are studying positive mood, and the factors that sustain it. We will assess your moods several times during this semester, to see how they fluctuate. We will also ask you to do something during this time that might affect your mood. This 'something' has already been shown to have significant positive effects on peoples' lives, and we want to further examine its potential.'' As evident from these instructions, we deemed it necessary to inform all participants of the purpose of the exercises (i.e., influencing mood) in order to bolster their commitment to perform them, and to allow us to generalize to naturalistic contexts in which people knowingly adopt new happiness-relevant strategies. Because participants in all three conditions received the same message (despite the fact that we expected the life details exercise to be less effective), this factor cannot confound the results.

Gratitude. The ''gratitude'' exercise was based on that of Emmons and McCullough (2003) and was introduced verbally by the experimenter as follows:

> *Let me get more specific. You have been randomly assigned to try to cultivate a sense of gratitude now, and during the next few weeks. ''Cultivate a sense of gratitude'' means that you make an effort to think about the many things in your life, both large and small, that you have to be grateful about. These might include particular supportive relationships, sacrifices or contributions that others have made for you, facts about your life such as your advantages and opportunities, or even gratitude for life itself, and the world that we live in. In all of these cases you are identifying previously unappreciated aspects of your life, for which you can be thankful. You may not have thought about yourself in this way before, but research suggests that doing so can have a strong positive effect on your mood and life satisfaction. So, we'd like to ask you to continue thinking in this way over the next few weeks, following up on the initial writing that you're about to do.*

These participants ($n = 21$) then turned to their questionnaires, which instructed them to ''write about the many things in [their] life, both large and small, that [they] have to be grateful about'' and provided the same examples as the verbal introduction. Students were asked to ''outline these reasons in as much detail as [they] can'' in the several blank lines provided.

Best possible selves (BPS). The ''best possible selves'' exercise was adapted from King (2001) and introduced verbally as follows:

> *Let me get more specific. You have been randomly assigned to think about your best possible self now,*

and during the next few weeks. ''Think about your best possible self'' means that you imagine yourself in the future, after everything has gone as well as it possibly could. You have worked hard and succeeded at accomplishing all of your life goals. Think of this as the realization of your life dreams, and of your own best potentials. In all of these cases you are identifying the best possible way that things might turn out in your life, in order to help guide your decisions now. You may not have thought about yourself in this way before, but research suggests that doing so can have a strong positive effect on your mood and life satisfaction. So, we'd like to ask you to continue thinking in this way over the next few weeks, following up on the initial writing that you're about to do.

The BPS participants ($n = 23$) then read almost identical instructions in their questionnaires, which directed them to write about their ''ideal life in the future'' in a blank space of several lines provided immediately below. They were prompted to ''outline [their] 'ideal future life' in as much detail as [they] can.''

Life details. The ''life details'' exercise was a typical control condition and was introduced verbally as follows:

Let me get more specific. You have been randomly assigned to pay more attention to the daily details of your life. ''Pay more attention to your life'' means that you take notice of the ordinary details of your life that you wouldn't typically think about. These might include particular classes or meetings you attend, typical interactions with acquaintances, typical thoughts that you have during the day, or your typical schedule as you move through the day. In all of these cases, you may be helped to better identify problem areas in your life, and to take action to change them. You may not have thought about yourself in this way before, but research suggests that doing so can have a strong positive effect on your mood and life satisfaction. So, we'd like to ask you to continue thinking in this way over the next few weeks, following up on the initial writing that you're about to do.

As in the other two conditions, these participants ($n = 23$) reviewed the verbal instructions again typed in their questionnaires. They were then provided with a several line-long blank space and prompted to ''write about [their] typical day, and the kinds of things that happen during it'' and to ''outline [their] typical day in as much detail as [they] can.''

After completing the writing, participants were encouraged to continue doing their exercise, as follows: ''Please keep doing this over the next couple of weeks, as it may provide significant benefits. Please try to do this exercise at least twice during this time.'' However, the consent form and experimenter script made clear that this was merely a suggestion, and not a study requirement.

Measures

Affect. To assess affect, we used the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), which contains 10 items measuring positive affect (PA; excited, enthusiastic) and 10 items measuring negative affect (NA; distressed, upset) on 5-point Likert–type scales. These items were administered four times. Pre-exercise PA and NA scores were computed by averaging the appropriate items from the first mood assessment, and post-exercise PA and NA scores were computed using the items from the second mood assessment. Follow-up PA and NA scores were computed by averaging the scale scores from the third and fourth assessments. Coefficient alphas ranged from 0.87 to 0.93 across these administrations.

Self-concordant motivation. To measure participants' initial motivation to continue doing the assigned exercise, we used the methodology developed by Sheldon and colleagues (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001; Sheldon & Kasser, 1995, 1998). SCM is typically assessed by measuring external motivation (acting to please others or for a reward), introjected motivation (acting to avoid guilt and self-recriminations), identified motivation (acting to express important values and beliefs), and intrinsic motivation (acting because it is inherently interesting and enjoyable to do so); these four motivations are aligned along a motivational internalization continuum (Deci & Ryan, 2000). Participants' instructions read: ''People do things for many different reasons. Please rate why you might keep doing this exercise, in terms of each of the following reasons.'' The external motivation item was ''because somebody else wants me to, or because my situation will force me to.'' The introjected item was ''because I would feel ashamed, guilty, or anxious if I don't do it; I will force myself.'' The identified item was ''because I value and identify with doing it; I will do it freely even when it is not enjoyable.'' Lastly, the intrinsic item was ''because I will really enjoy doing it; I will find it to be interesting and challenging.'' As in much past research, an aggregate SCM score was computed by averaging the identified and intrinsic ratings and subtracting the external and introjected ratings (Sheldon & Elliot, 1999; Sheldon & Kasser, 2001; $\alpha = 0.50$).[2]

Exercise performance. Continued performance of the assigned exercise 2 weeks after the lab session was

assessed with the item ''How many times did you actually do the exercise over the last two weeks?'' Participants typed a number into a text box. These responses ranged from 0 to 12, with a mean of 3.04. Because we expected a performance decline later in the study, exercise performance 4 weeks after the lab session was assessed with a simple dichotomous item: ''Are you still doing the exercise?'' Thirty participants responded ''yes'' and 37 responded ''no.'' These two variables correlated $r = 0.38$ and were combined after standardization to yield the most reliable measure of sustained exercise performance ($\alpha = 0.56$), which we will call ''exercise performance.''

Results

Preliminary analyses

We first examined pre-exercise (baseline) PA and NA as a function of condition assignment, expecting to find no differences because of random assignment. Although no differences in initial PA ($p > 0.15$) were found, significant differences emerged in NA ($p < 0.01$), such that participants in the gratitude condition began with higher NA ($M = 2.24$) than those in the BPS ($M = 1.64$) and control ($M = 1.89$) conditions. Fortunately, our hypotheses concern changes in affect relative to an individual's own baseline; thus, this unexpected initial difference is of little consequence. Finally, we tested for effects of sex of participant in all of the study variables, and found no mean differences; therefore, this variable is ignored henceforth.

Hypothesis tests

Hypothesis 1. Table I contains the mean affect scores as measured before the exercise, immediately after the exercise, and several weeks after the exercise, split by exercise condition. To test our first hypothesis, that the gratitude and BPS exercises would create greater immediate mood boosts compared to the control condition, we conducted two MANOVAs, one for positive affect and one for negative affect. Exercise Type (Gratitude/BPS vs. Control) was a between-subjects factor with two levels and Time of Measurement (Pre-Intervention vs. Post-Intervention) was a within-subjects factor with two levels.

In the analysis of positive affect scores, neither type of exercise nor time of measurement emerged as main effects. However, the predicted two-way interaction was in evidence, $F(1, 65) = 5.32$, $d = 0.34$, $p < 0.05$, such that those in the gratitude and BPS conditions increased in PA (from 3.63 to 3.78; $t(43) = 2.19$, $p < 0.05$) compared to those in the control condition, who trended downward (from 3.72 to 3.60 ns). Figure 1 displays a graphic representation of these effects. Follow-up analyses comparing the BPS condition to the control condition also revealed this two-way interaction to be significant, $F(1, 44) = 6.80$, $d = 0.33$, $p < 0.01$; however, the interaction was not significant in the contrast between the gratitude and control conditions, $F(1, 42) = 1.66$, $p < 0.20$. Thus, the BPS exercise appeared to have a larger initial effect on affect than the gratitude exercise, relative to the control condition. Despite this finding, the gratitude and BPS conditions did not significantly differ from each other in their effects on positive mood, as the Exercise Type X Time of Measurement interaction was not significant in the relevant contrast, $F(1, 42) = 2.12$, $p < 0.15$.

Analyses of the negative affect scores revealed merely main effects of time of measurement, that is, NA declined equally in a contrast between the two positive exercises (gratitude and BPS) and the control exercise, and separate pairwise comparisons among the three conditions also showed only time of measurement main effects (all $p < 0.01$). These results suggest that all three exercises had beneficial effects in terms of reducing negative mood.

Table I. Mean (SD) for pre-intervention, post-intervention, and follow-up mood scores by exercise condition.

	Exercise condition					
	Gratitude		BPS		Details	
	M	SD	M	SD	M	SD
Positive affect						
Pre-intervention PA	3.44	0.56	3.79	0.72	3.72	0.58
Post-intervention PA	3.49	0.60	4.04	0.59	3.60	0.78
Follow-up PA	3.27	0.67	3.45	0.90	3.40	0.79
Negative affect						
Pre-intervention NA	2.24	0.53	1.64	0.50	1.89	0.53
Post-intervention NA	2.04	0.85	1.43	0.42	1.74	0.63
Follow-up NA	2.11	0.69	1.81	0.68	1.76	0.52

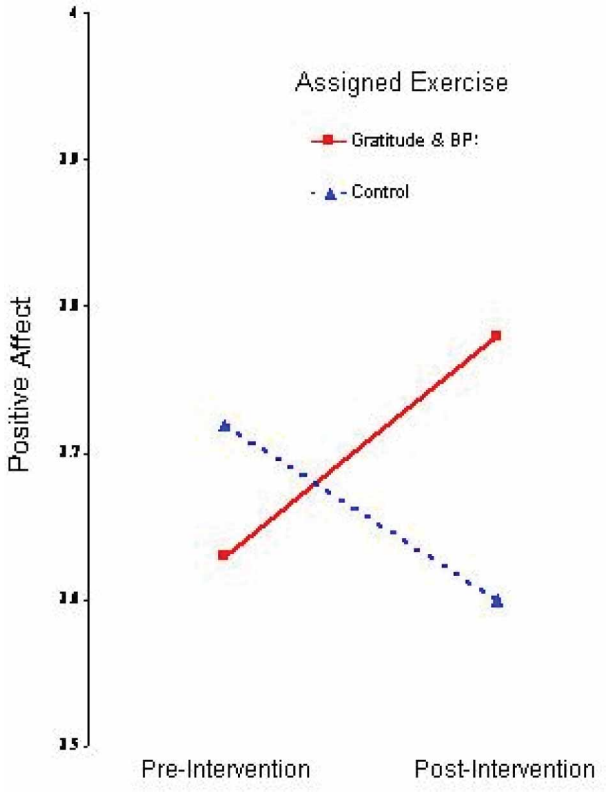

Figure 1. Effects of the focal exercises on change in positive affect, relative to a control exercise.

To test Hypothesis 2, that the gratitude and BPS exercises would inspire greater self-concordant motivation than the control exercise, we conducted a MANOVA on the SCM score, with Exercise Type (Gratitude/BPS vs. Control) as a between-subjects factor with two levels. The expected main effect emerged, such that the gratitude and BPS exercise participants reported greater SCM than did the control participants ($M = 3.29$ vs. 2.88, both $SD = 0.71$), $F(1, 65) = 5.08$, $d = 0.32$, $p < 0.05$. Follow-up analyses comparing the BPS condition to the control condition also revealed a significant difference ($M = 3.45$ vs. 2.88, $SD = 0.74$ and 0.70), $F(1, 42) = 7.07$, $d = 0.38$, $p < 0.01$, but the difference was not significant in the contrast between the gratitude and control conditions ($M = 3.12$ vs. 2.88, $SD = 0.65$ and 0.70), $F(1, 42) = 1.37$, $p < 0.25$. Thus, it appears that the BPS exercise had a larger effect on SCM relative to the control condition, compared to the gratitude exercise. However, the gratitude and BPS conditions did not significantly differ from one another in their effects on SCM ($M = 3.45$ vs. 3.12, $SD = 0.74$ and 0.65), $F(1, 42) = 2.42$, $p < 0.13$.

Hypothesis 3. According to our third hypothesis, initial SCM should predict exercise performance. To test this, we correlated SCM with exercise performance. The association was indeed significant ($N = 67$, $r = 0.28$, $p < 0.02$). Interestingly, SCM was more strongly associated with exercise performance in the gratitude ($N = 21$, $r = 0.37$, $p < 0.15$) and BPS ($N = 23$, $r = 0.36$, $p < 0.15$) conditions, compared to the control condition ($N = 23$, $r = 0.13$, $p > 0.55$). Although this suggests that SCM may better predict whether an individual actually performs an exercise when the exercise is one that is designed to be enjoyable and meaningful, a supplementary regression revealed no significant Exercise (Gratitude/BPS vs. Details) X SCM interaction in predicting exercise performance ($p > 0.30$). Notably, this supplementary analysis also showed a near-significant Gratitude/BPS vs. life details effect on performance ($\beta = 0.20$, $p < 0.11$), such that participants better performed the two exercises hypothesized to be effective.

Hypothesis 4. In Hypothesis 4, we expected exercise performance to predict more positive affect at the end of the study. To test this, we conducted two regressions predicting follow-up final PA and follow-up final NA, respectively, from the corresponding initial affect score and from exercise performance.[3] Two dummy variables were also entered into each regression, representing gratitude and BPS, to control for condition main effects. In addition, two interaction product terms were entered at the second step of these two regressions, to test whether performing the exercise had differential effects on sustained mood as a function of whether the participant was in the gratitude or the BPS condition.

In the positive affect analysis, initial PA had a strong effect ($\beta = 0.57$, $p < 0.01$), demonstrating substantial test–retest stability. The two condition dummy variables were non-significant. Furthermore, supporting our fourth hypothesis, exercise performance was also significant in this analysis ($\beta = 0.22$, $p < 0.05$). Interestingly, at the second step, the interaction between BPS and exercise performance was positive and marginally significant ($\beta = 0.29$, $p = 0.057$), indicating that continuing to perform the BPS exercise had a stronger effect on sustained increases in positive mood than did the other two exercises. The gratitude by exercise performance interaction was not significant ($p > 0.80$).

In the negative affect analysis, initial NA (like initial PA) was highly significant ($\beta = 0.51$, $p < 0.01$), also demonstrating a substantial test–retest effect. Again, the two condition dummy variables were non-significant. Inconsistent with Hypothesis 4, however, the effect of exercise performance was not significant, although it was in the expected direction ($\beta = -0.16$, $p < 0.14$). At the second step, the interaction between BPS and exercise performance was negative,

but non-significant ($\beta = -0.24$, $p < 0.15$). The trend observed suggests that continuing to perform the BPS exercise may have a stronger sustained dampening effect on negative mood than the other two exercises.

Hypothesis 5. According to our fifth hypothesis, exercise performance and SCM should interact to influence sustained mood changes. To test this hypothesis, we conducted two regressions, one predicting final positive affect and one predicting final negative affect. As above, the appropriate initial mood variable was entered at the first step, along with SCM and the two dummy variables. The product of SCM and exercise performance was entered at the second step.

In the positive affect analysis, initial PA was again a highly significant predictor ($\beta = 0.56$, $p < 0.01$) of follow-up PA. SCM and the two dummy variables were not associated with change in positive affect. Failing to support Hypothesis 5, the SCM X Exercise Performance interaction was non-significant at the second step ($\beta = 0.14$, $p < 0.22$), although it was in the predicted direction.

In the negative affect analysis, initial NA was again a highly significant predictor ($\beta = 0.51$, $p < 0.01$) of final NA. Again, SCM and the two dummy variables were not associated with change in negative mood. However, consistent with Hypothesis 5, the SCM X Exercise Performance interaction was significant at the second step ($\beta = -0.23$, $p < 0.05$). Performing the exercise regularly lead to reduced negative affect, and this pattern was stronger the more participants felt self-concordant in performing the exercise.

Discussion

In this study, we compared two promising mental strategies for elevating positive affect: counting one's blessings (gratitude) and considering one's best possible selves (BPS). As discussed above, positive mood inductions are typically designed to be temporary and to influence some other behavior of interest. Instead, we asked participants to continue performing the induction over the subsequent 4 weeks, as a means of positively impacting their emotional state over time. We then examined the motivational predictors of the extent to which participants continue to perform the exercise, as well as the affective outcomes of such continuing performance. To this end, we hoped to test important predictions of both the self-concordance model (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001) and the sustainable happiness model (Lyubomirsky, Sheldon, et al., 2005a; Sheldon & Lyubomirsky, 2004).

To summarize the results: doing all three of the exercises, including the control "pay attention to life details" exercise, produced immediate reductions in negative affect. However only the BPS exercise produced a significant increase in immediate positive affect. The gratitude exercise fell midway between the control and the BPS exercise in terms of boosting PA, although it did not differ from either the BPS or the control condition. In addition, the BPS exercise prompted the highest degree of self-concordant motivation; that is, participants indicated greater identification with and interest in continuing to do the BPS exercise, relative to the others. Furthermore, self-concordant motivation itself predicted whether participants continued to carry out the exercise over the next 4 weeks; not surprisingly, those who identify with and expect to enjoy an exercise are more likely to keep doing it. Also, continuing to perform the exercise, in turn, predicted stronger positive mood in the follow-up assessments. This was especially true for the BPS exercise, as evidenced by the Self-Concordant Motivation X Exercise Performance interaction. Finally, self-concordant motivation and exercise performance interacted to influence follow-up negative affect, that is, the more participants initially identified with and expected to enjoy their exercise, the more actually doing the exercise triggered reductions in their negative mood.

Thus, consistent with the "sustainable happiness" model (Lyubomirsky, Sheldon, et al., 2005a; Sheldon & Lyubomirsky, 2004), our findings suggest that longer-term emotional benefits require persistent effort to achieve. In addition, the "fit" of the exercise with the participant's personality, interests, and goals played an important role, suggesting that happiness seekers would be well advised to carefully consider their choices among possible happiness-increasing strategies. Our results are also consistent with previous findings supporting the self-concordance model (Sheldon & Elliot, 1999; Sheldon & Kasser, 2001), which have shown that self-concordant personal goals are relatively more enduringly energized over time and also more satisfying when attained. This convergence suggests that many of our study participants were indeed willing to adopt our suggestion that they continue performing the exercise, transforming the suggestion into a personal goal of their own.

However, it is also important to identify several weaker features of these data. First, as can be seen in Table I, we found no lasting effects of condition assignment alone on follow-up PA and NA; only when exercise performance was taken into account did such effects emerge. Still, it makes logical sense that one would have to keep up an exercise in order for it to have continuing effects. Second, even participants who reliably performed the most effective

(BPS) exercise only managed to maintain their PA, rather than showing drops in PA like the rest of the sample. Yet, such sample-wide declines in well-being are common in college populations assessed over a semester. In such circumstances, exercises such as ours may function more as buffers or sources of resilience than as means of becoming even happier. Third, our mood measure was the PANAS, which has been shown to be biased towards activated positive emotions (such as ''excited,'' ''strong,'' and ''inspired''; Feldman-Barrett & Russell, 1998; Watson, Wiese, Vaidya, and Tellegen, 1999). If additional mood adjectives assessing ''quieter'' positive emotions (such as ''content,'' ''satisfied,'' and ''serene'') had been employed, then the results may have been different, for example, the gratitude manipulation may have had stronger effects.

A final limitation of our study is that the pattern of effects was somewhat mixed. Our hypothesis that the two key exercises would work better than the control exercise was supported only for positive affect, and then only for the BPS exercise. Also, the hypothesis that self-concordant motivation would interact with performance to affect mood was only supported for negative affect. Still, these might be construed as rather considerable effects for a simple 2-minute exercise that we merely requested participants continue to perform, given the many competing distractions and demands on these students. Eliciting greater initial understanding and commitment from participants, or reinforcing the effect of the exercises via a more elaborate initial encounter, instructions that continued performance is required, or regular reminders, might prove very fruitful for boosting the impact of the manipulations.

Why did the BPS exercise yield greater emotional benefits than the gratitude exercise in this study? Although we are reluctant to generalize from our relatively small sample and limited longitudinal follow-ups, we found that participants identified with the BPS exercise significantly more than with the others. This is reasonable, given that envisioning best future selves may be inherently self-relevant and motivating (Roberts et al., in press). Alternatively, relative to the ease and enjoyment of imagining that one's future goals have been achieved, generating a list of *current* aspects of life for which one is grateful may be somewhat more challenging and less fun for participants, and more difficult for them to grasp or accept the importance of doing so. It is also worth noting that our only dependent variable was mood. Although contemplating one's best possible self may have particularly positive effects on affect (King, 2001), cultivating gratitude may be relatively more difficult to accomplish, yet may have positive and perhaps deferred effects on other variables, such as forgiveness, cooperation, and reduced conflict, which were not measured here. Thus, we believe that *both* positive strategies used in this study deserve further research attention, along with an expanded range of measures of emotions, well-being, and other relevant outcomes.

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Notes

1. Three participants were dropped because they did not complete the third assessment.
2. The relatively low alpha may have been due to the fact that the current SCM measure presented only a prototype for each of the four dimensions of the SCM construct, rather than presenting multiple items for each dimension as do some other measures. This was done based on Sheldon and colleagues' goal research (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001), and because of space limitations. However, Sheldon and colleagues usually average these prototype-ratings across multiple goal-stems, thereby creating a longer and perhaps more reliable measure. Although our predictions regarding SCM were mostly confirmed, future research assessing SCM for a single activity-stem should use multiple items per dimension.
3. As can be seen in Table I, participants tended to decline in PA and increase in NA at the follow-up assessments, an effect we often observe as the semester progresses (e.g., Sheldon & Houser-Marko, 2001). Analyses testing Hypothesis 4 examine whether performing the exercise makes participants less likely to experience these negative changes, providing support for this hypothesis.

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