Do Positive Psychology Exercises Work? A Replication of Seligman et al. (2005)

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Objectives: The current work replicated a landmark study conducted by Seligman and colleagues (2005) that demonstrated the long-term benefits of positive psychology exercises (PPEs). In the original study, two exercises administered over 1 week ("Three Good Things" and "Using your Signature Strengths in a New Way") were found to have long-lasting effects on depression and happiness (Seligman, Steen, Park, & Peterson, 2005). **Design:** These exercises were tested here using the same methodology except for improvements to the control condition, and the addition of a second "positive placebo" to isolate the common factor of accessing positive, self-relevant constructs. This component control design was meant to assess the effect of expectancies for success (expectancy control), as well the cognitive access of positive information about the self (positive placebo). **Results:** Repeated measures analyses showed that the PPEs led to lasting increases in happiness, as did the positive placebo. The PPEs did not exceed the control condition in producing changes in depression over time. **Conclusions:** Brief, positive psychology interventions may boost happiness through a common factor involving the activation of positive, self-relevant information rather than through other specific mechanisms. Finally, the effects of PPEs on depression may be more modest than previously assumed. J. Clin. Psychol. 68:382–389, 2012.

Keywords: positive psychology exercises; signature strengths; three good things; depression; happiness; e-mental health

Positive psychology is the study of positive experiences, positive character traits, and the institutions that help cultivate them (Seligman, 2011). Its proponents argue that the movement has embraced the most rigorous scientific approach in the study of positive human experience, and research has proliferated capturing the attention of thousands of scientists (Seligman et al., 2005; Simonton & Baumeister, 2005; Seligman, 2011). Positive psychotherapy is now emerging as a new form of intervention, pitting itself against established therapy approaches (Seligman, Rashid, & Parks, 2006; Wood & Tarrier, 2010). The techniques espoused by positive psychologists must be held to the same level of scrutiny and accountability as the more traditional forms of intervention. As stated by Seligman (2011), positive psychology should teach people effective pathways to improved functioning and well-being.

The current work takes a critical look at a landmark study conducted by Seligman and colleagues (2005) documenting the efficacy of positive psychology exercises (PPEs). They tested happiness interventions via the Internet with a convenience sample of 411 participants using a random assignment, placebo control design. The happiness interventions comprised daily exercises performed over a 1-week period. The placebo control involved writing about early memories every night for a week. The two most effective exercises included (a) "Three good things in life," in which participants were asked to write three good things that happened that day and why they happened, and (b) "Using signature strengths in a new way," in which participants took an online inventory of their character strengths which provided feedback about their top five strengths as catalogued by Peterson and Seligman (2004). Participants were then asked to use one of those strengths in a new and different way every day for 7 days.

Seligman et al. (2005) collected information on happiness and depressive symptoms at pretest, posttest, 1 week, 1 month, 3 months, and 6 months after the administration of these interventions.

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The "Three good things" and "Using signature strengths in a new way" conditions led to particularly positive results when the changes in mood were considered over a longer period of time. For both interventions, differences in levels of depression and happiness were evident at the 1-month, 3-month, and 6-month assessments when compared with the early memory control condition. These two positive psychology exercises (PPEs) were included for replication in the current work.

The aim of the current study was to replicate these results while enhancing the scientific rigor of the work by Seligman and colleagues (2005). The same methodology was employed except for modifications to the early memory control condition. A more convincing rationale as to why this exercise may improve well-being was included to match the rationales of the "The three good things" and "Using signature strengths in a new way" exercises. Termed the "expectancy control," this exercise involved an argument for how reflecting on the past, even for a short period of time, can increase understanding, self-acceptance, and happiness. This change was designed to control for a "common factor" (Frank & Frank, 1991) in PPEs involving high expectancies for success. If the PPEs failed to outperform this control condition, then their effects could be attributed to the manipulation of belief in positive change.

As found in component control designs in psychotherapy research (Haaga & Stiles, 2000), the "therapeutic ingredients" in PPEs were dismantled further by isolating a common component involving the access of positive, self-relevant information. A "positive placebo" was created identical to the first control exercise, except that positive memories about one's life had to be retrieved. The role of this positive placebo was to assess whether there was anything "special" about the PPEs other than the access of positive self-representations. These group comparisons appeared critical in light of a concluding statement made by Seligman et al. (2005): "The finding of beneficial effects [of PPEs] with no human therapeutic alliance suggests the operation of powerful specific ingredients in the exercises" (Seligman et al., 2005, p. 420). The main purpose of the current work was to test whether those exercises, now incorporated in positive psychotherapy (Rashid & Seligman, 2011), involved specific ingredients responsible for increasing well-being rather than a common focus on positive aspects of one's self and one's life.

In short, this study attempted to add to the body of research on positive interventions by first replicating the effects reported by Seligman et al. (2005). In addition, the demand characteristics of the original control exercise were improved, and a second positive placebo was added to test for the effects of accessing positive information about the self. The main hypothesis was that the PPEs ("Using signature strengths in a new way" and "Three good things") would be associated with increases in happiness and decreases in depressive symptoms relative to both placebo groups over 6 months, replicating the findings of Seligman and colleagues (2005). Both control groups (early, and early positive memories) were expected to provide temporary boosts in mood that would dissipate over time because they did not involve any specific "therapeutic" element.

Method

Participants

The initial sample comprised 1,447 primarily White (78%), Canadian (84%) females (83%). Participant ages ranged from 18 to 72 years, with a mean of 33. Participants were recruited primarily through advertisements on Facebook, with an ad stating: "Feel better: Participate in Project HOPE (**H**arnessing **O**ne's **P**ersonal **E**xcellence)." The advertisements appeared to Canadian users over 18 years of age.

In terms of demographics, 64% of participants had some college or university education, with 40% earning under $20,000 a year and 23% earning over $50,000. Thirty percent of participants were married and 44% percent had children. As a whole, the sample had clinically significant levels of depressive symptomatology (Center for Epidemiologic Studies Depression Scale [CES-D] measure of depression, $\bar{x} = 20.39$, s = 14.62, which is above the cut-off for mild depression, $\bar{x} = 16$; Geisser, Roth, & Robinson, 1997).

Participant remuneration. Participants who registered for the study before November 1, 2007, received $30 remuneration upon completion of the posttest measures administered at 1 week (55% received remuneration). To manage costs while increasing sample size, participants registering after this date were not offered $30 but were entered into a $1,000 draw upon completion of the posttest measures. To encourage participation in subsequent follow-up sessions, all participants were entered in a $1,000 raffle at each follow-up. The incentives in the current study were slightly higher than those provided by Seligman and colleagues (2005), who offered one $500 and three $100 awards at each follow-up.

Measures

Steen Happiness Index (SHI). The SHI was created and utilized by Seligman et al. (2005) to serve as a measure of happiness that might be particularly sensitive to upward changes in happiness (Seligman et al., 2005; Duckworth, Steen, & Seligman, 2005). The index comprises 20 items that require the participant to choose from one of five statements that most closely reflects how they have felt over the past week. Scores on this scale were found to be highly correlated with other measures of happiness and to have an internal consistency of $\alpha = .95$ and a test-retest reliability of .97 over 1 week (Seligman et al., 2005).

CES-D. The CES-D (Radloff, 1977; also utilized in Seligman et al., 2005) is a widely used 20-item inventory designed to measure the incidence of depressive symptoms over the prior week. Each symptom is rated in terms of frequency on a 5-point Likert scale, ranging from 0 (less than 1 day) to 4 (most or all of the time). Much research has illustrated the good internal consistency, reliability, convergent and concurrent validity, and sensitivity of this measure (Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995). Internal consistency has been reliably found to be excellent in a wide variety of samples (Corcoran & Fisher, 1987; Radloff, 1977).

Procedure

The measures and design of the study were identical to that of Seligman et al. (2005). Participants were asked to log onto the website for the study entitled Project HOPE at www.projecthopecanada.com. Participants then completed a battery of tests including baseline measures of happiness (SHI) and current depressive symptoms (CES-D) and then were randomly assigned to one of four conditions. Segments of the rationales for each condition are provided below:

- Expectancy control (early memories): "'The unexamined life is not worth living (Socrates).' The importance of self-knowledge and understanding has long been recognized. We believe that a strong sense of self and an understanding of the factors that have come to make you the person you are today are essential components of well-being. Our early life experiences can influence us and play a role in how we think and act later on in our lives. It may be important to reflect upon these early experiences to gain a better understanding of the person we are today. Every night over the next week, set aside about 10 minutes before bed to do this exercise. It will require you to log on to this website to write about an early memory."
- Positive placebo (positive early memories, in addition to rationale above): "A careful consideration of our past may help us to better understand who we are today and ultimately lead to increased self-acceptance and well-being, particularly when we focus on the positive aspects. Every night over the next week, set aside about 10 minutes before bed to do this exercise. It will require you to log on to this website to write about an early *positive* memory."
- Three good things (Seligman et al., 2005): "We think too much about what goes wrong and not enough about what goes right in our lives. Of course, sometimes it makes sense for us to analyse bad events so that we can learn from them and avoid them in the future. However, people tend to spend more time thinking about what is bad in life than is helpful. Worse, this tendency to focus on bad events sets us up for anxiety and depression. One way to keep this from happening is to develop our ability to think about the good in life. In order to help you

build this skill you will be asked to log on to the website daily for seven days to list three things that went well on that day and why they happened."

- Using signature strengths in a new way (Seligman et al., 2005): "Honesty. Loyalty. Perseverance. Creativity. Kindness. Wisdom. Courage. Fairness. These and about 16 other character strengths are valued in almost every culture in the world. We believe that people can get more satisfaction out of life if they learn to identify which of these character strengths they possess in abundance and then use them as much as possible whether working, loving, or playing. This exercise consists of two parts. You will take a questionnaire that gives you feedback about your strengths. This will take about 45 minutes. The next day you will be asked to use these strengths in new ways every day for one week and to report back to us each day to describe how you did so."

All exercises included a requirement of approximately 10 minutes a day and all stated the same expectancy priming: "The benefits of this work may not be immediate, but like exercising, the advantages can emerge over time with continued practice". At the conclusion of the week-long exercise period, participants completed outcome measures including the CES-D and the SHI. Participants were also sent reminder e-mails for their 1-month, 3-month, and 6-month online follow-up assessments including the CES-D and the SHI.

Results

Attrition

There were a total of 1,447 participants who filled out the initial questionnaires and were assigned to an exercise condition. Of these, 344 (24%) completed all the requirements of the study, including the 6-month follow-up. t tests show that those who dropped out by 6 months were, at baseline, more depressed, CES-D; $t(1444) = 2.07$, $p = .04$, and less happy, SHI; $t(1444) = -3.66$, $p < .001$. Drop-out rates did not differ significantly by condition, $\chi^2(3) = 4.77$, $p = .19$.

Replication of Seligman et al. (2005)

Happiness. The analyses in Seligman et al. (2005) involved repeated measures analyses of variance (ANOVAs) that were replicated here to determine whether "Three good things" and "Using signature strengths in a new way" were effective in increasing happiness levels over the 6-month study period over and above the control conditions. Participants who completed test measures at all five time points were included.[1]

An overall repeated measures ANOVA was conducted (four conditions by five time periods) for the happiness measure (SHI).[2] A significant main effect for time was found, F(4,

[1]A drawback of the repeated ANOVA statistic is that participants with missing data points are excluded, which is particularly problematic given our high attrition rate. Multilevel modeling, conducted in SAS and using maximum likelihood estimation was performed as a sensitivity test. The models were run on participants who provided data at baseline and 1 week ($n = 960$) to preserve a more balanced data set and produce reliable estimates. Payment for participation and demographic variables including age, gender, income, education, as well as adherence (number of nights the exercises were completed) were included in the models to determine their potential influence on outcome. All groups, including "Early positive memories" (estimate = .03, standard error [SE] = .01, $t = 2.82$, $p = .005$), "Three good things" (estimate = .03, $SE = .01$, $t = 2.68$, $p = .007$), and "Using signature strengths in a new way" (estimate = .03, $SE = .01$, $t = 2.21$, $p = .03$), were related to *higher rates of change in happiness* compared with the expectancy control group. The PPEs were not significantly different from the positive placebo. The "Three good things" exercise was marginally associated with greater reductions in depression when compared with the "Early memories" control group (estimate = −.46, $SE = .25$, $t = -1.87$, $p = .06$), but not compared with the positive placebo (estimate = −.14, $SE = .24$, $t = -.57$, $p = .57$). These results mirror those obtained with the repeated measures ANOVAs presented in the text.

[2]Eleven participants failed to complete the SHI, explaining the differences in the degrees of freedom for the happiness and depression analyses.

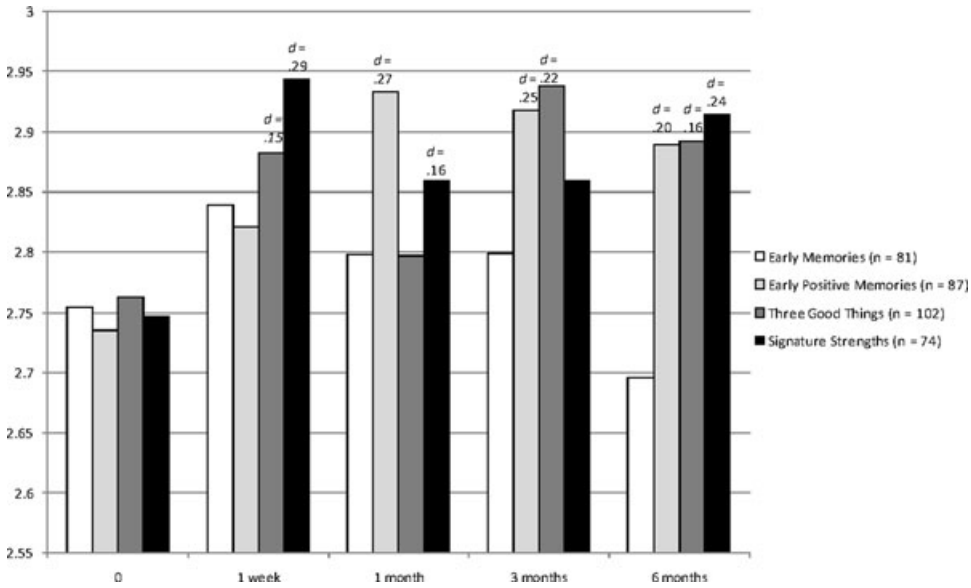

Figure 1. Average happiness scores on the SHI over the 6-month study period.
Note. Effect sizes are noted where means differed significantly from baseline ($p < .05$).

337) = 8.53, $p < .001$, $\eta_p^2 = .092$, indicating that participants increased in self-reported levels of happiness over time. A significant time by condition interaction was also obtained, $F(12, 1017) = 2.35$, $p = .006$, $\eta_p^2 = .027$, showing varying changes in happiness over time among the conditions.

Planned contrasts were conducted comparing happiness scores at each follow-up to baseline scores within each group. Participants in the expectancy control group tended to increase in happiness at 1 week ($p = .07$, $d = .10$), but returned to baseline at the 1-month, 3-month, and 6-month follow-ups ($ps > .10$; see Figure 1). Thus, as expected, the control condition may have boosted mood initially due to expectancy effects, but did not lead to any lasting change in happiness. The "Early positive memories" placebo condition showed significant increases in happiness at 1 month ($p < .001$, $d = .27$), 3 months ($p = .001$, $d = 25$), and 6 months ($p = .01$, $d = 20$; see Figure 1). Thus, our results indicate that our positive placebo was associated with lasting gains in happiness.

For "Three good things," happiness increased significantly at 1 week ($p = .004$, $d = .15$), and continued to be elevated at the 3-month ($p = .001$, $d = .22$) and 6-month ($p = .02$, $d = .16$) follow-ups (see Figure 1). For "Using signature strengths in a new way," happiness significantly increased compared with baseline levels at 1 week ($p < .001$, $d = .29$), 1 month ($p = .03$, $d = .16$), and at 6 months ($p = .01$, $d = .24$; see Figure 1). In summary, the Seligman and colleagues (2005) findings for happiness were mostly replicated, and the PPEs surpassed the effect of the expectancy control group, but not the positive placebo.

Depressive Symptoms. Parallel analyses were conducted with depressive symptoms to determine how exercises may have affected depression over time. An overall repeated measures ANOVA was conducted (four conditions by five time points) with the CES-D as the outcome measure. Participants evidenced significant decreases in depressive symptoms over the 6-month study, effect for time, $F(4, 348) = 4.57$, $p = .001$, $\eta_p^2 = .050$. However, contrary to the findings obtained by Seligman et al., (2005), there was no time by condition interaction effect, $F(12, 1050) = 1.48$, $p = .13$, indicating that changes in the CES-D did not differ across conditions.

Discussion

Replication of Seligman et al. (2005)

A science builds itself on tests of replicability. Seligman and colleagues (2005) previously reported impressive findings that demonstrated the effectiveness of positive psychology exercises in increasing levels of happiness and decreasing depression over a period of 6 months. Our methodology was identical, but utilized more powerful placebos and yielded results that were more modest. The PPEs produced greater increases in happiness compared with the expectancy control condition, confirming that their effectiveness cannot be reduced to the creation of "high hopes." But the positive placebo (positive early memories) produced effects that were as significant and as long lasting as those of the "Three good things" and "Using signature strengths in a new way" exercises. We may have serendipitously stumbled upon another effective exercise with its own specific ingredients, but we prefer to believe that the access of positive, self-relevant information is the common factor with the largest "therapeutic" effect shared with the other PPEs.

In sharp contrast to the findings reported by Seligman and colleagues (2005), the PPEs did not lead to significantly greater reductions in depression over time compared with the control group. The difference in our findings may be attributable to differences in control groups. The rationale in the expectancy control condition provided a credible explanation for success that may have narrowed the gap between groups over time. Furthermore, our participants were slightly more depressed than those in Seligman et al. (2005), and may have been lower functioning.[3] Another possible explanation for the more glowing results reported by Seligman and colleagues (2005) lies in their sample recruited through Seligman's self-help book *Authentic Happiness* (2002). This select group may have had higher levels of motivation, greater interest, and belief in positive psychology exercises. This possibility is supported by the fact that the drop-out rate for participants in Seligman and colleagues (2005) was much lower (29%) than the one in the current study (76%).

Much of what is effective in psychotherapy is attributable to common factors, while specific techniques account for about 15% of improvement (Asay & Lambert, 1999). It may be useful for positive psychologists to draw from this foundation, and moderate some conclusions. For example, Seligman et al. (2005) state: "Identifying specific ingredients is an uncommon early move in the testing of interventions (PPEs), and our studies go beyond such demonstrations" (p. 419). We obtained little or no difference between the "Three good things," "Using signature strengths in a new way," and the positive placebo exercise. We could not demonstrate the unique qualities or specific ingredients belonging to PPEs exclusively. Furthermore, "client factors" (Asay & Lambert, 1999) must be taken into consideration for the results obtained by Seligman et al. (2005) and us. Both samples involved people who wanted to become happier, had access to books and Internet resources, and were interested in online self-help. This client factor makes the generalization to other populations difficult.

Summary and Future Directions

Some criticisms have been targeted at the placebo controls in positive psychology research and the potentially premature conclusions drawn around the efficacy of some interventions (Wood & Tarrier, 2010). Our design allowed us to partial out expectancy effects, and the results suggest that PPEs do more than provide belief in change when it comes to self-reported levels of happiness. Our design also allowed for further consideration of the common component that may underlie the effectiveness of PPEs. The access of positive aspects of the self-schema may be a common feature shared across the PPEs and the positive placebo in this study. Perhaps thinking positively about your past, your day, or your strengths activates the natural growth potential in individuals (Tallman & Bohart, 1999) and may well mobilize hope by providing tools that bolster optimism

[3]The average CES-D score in Seligman et al. (2005) hovered around 14, while the average score in the current sample was 20.4.

Table 1
Means for Happiness and Depression Across Conditions and Across Time

	Baseline	1 week	1 month	3 months	6 months
Happiness (SHI)					
Early memories ($n = 81$)	$x = 2.75$, $s = .81$	$x = 2.84$, $s = .83$	$x = 2.80$, s = .86	$x = 2.80$, $s = .85$	$x = 2.70$, $s = .88$
Early positive memories ($n = 87$)	$x = 2.74$, $s = .72$	$x = 2.82$, $s = .76$	$x = 2.93$, $s = .75$	$x = 2.92$, $s = .76$	$x = 2.89$, $s = .85$
3 good things ($n = 102$)	$x = 2.76$, $s = .78$	$x = 2.88$, $s = .81$	$x = 2.80$, s = .83	$x = 2.94$, $s = .82$	$x = 2.89$, $s = .87$
Signature strengths ($n = 74$)	$x = 2.75$, $s = .65$	$x = 2.94$, $s = .72$	$x = 2.86$, $s = .76$	$x = 2.86$, $s = .75$	$x = 2.91$, $s = .74$
Depression (CES-D)					
Early memories ($n = 84$)	$x = 19.61$, $s = .14.44$	$x = 18.80$, $s = 13.49$	$x = 19.93$, $s = 14.02$	$x = 20.45$, $s = 14.79$	$x = 20.04$, $s = 14.90$
Early positive memories ($n = 90$)	$x = 19.19$, $s = 14.05$	$x = 17.19$, $s = 13.13$	$x = 15.84$, $s = 12.55$	$x = 17.14$, $s = 12.91$	$x = 17.67$, $s = 14.34$
3 good things ($n = 106$)	$x = 19.47$, $s = .14.41$	$x = 15.66$, $s = 11.59$	$x = 18.57$, $s = 12.64$	$x = 16.47$, $s = 11.84$	$x = 16.56$, $s = 14.90$
Signature strengths ($n = 75$)	$x = 17.73$, $s = .14.50$	$x = 14.99$, $s = 13.10$	$x = 16.81$, $s = 14.06$	$x = 14.28$, $s = 11.93$	$x = 15.69$, $s = 14.82$

Note. SHI = Steen Happiness Index (Seligman et al., 2005). CES-D = Center for Epidemiologic Studies Depression Scale (Radloff, 1977).

and stimulate pathways toward change (Snyder, Ilardi, Michael, & Cheavens, 2000). It could also activate positive emotions that are known to broaden cognition, leading to behavioural changes and upward spirals in mood (Fredrickson, 2001; Garland et al., 2010). Future research on PPEs should seek to elucidate the specific mechanisms responsible for improvements in mood and flourishing and explain how and why they work. This will be most fruitfully accomplished with rigorous methodological designs and a guiding theory of psychological growth.

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