Looking forward to tomorrow: The buffering effect of a daily optimism intervention

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This research demonstrates the effectiveness of a brief daily self-applied optimism intervention in an adult normal population. Participants completed Life Orientation Test-Revised, Positive and Negative Affect Scale, Satisfaction with Life Scale, and Burnout Measure scales before, immediately after, and one month after the intervention. At baseline, optimism intervention group ($N = 36$) and control group ($N = 41$) were statistically similar on the variables of interest. At post-test, and also one month later, the intervention group demonstrated reduced pessimism, negative affect, and emotional exhaustion, although optimism, positive affect, and life satisfaction did not increase. Higher initial optimism increased the intervention effect for the optimism group, but not for the control group, by diminishing negative affect and emotional exhaustion, and increasing optimism. Sixty-one percent of the activities mentioned by the control group participants focused on duties and work, compared to 28% in the optimism condition. No correlations were found between initial optimism or pessimism, and the type of activities mentioned.

Keywords: optimism intervention; optimism/pessimism; positive/negative affect; life satisfaction; emotional exhaustion

Researchers have recently taken increasing interest in strengths of character and their relations with, and contributions to, life satisfaction, positive mood, and other desired outcomes. Optimism is considered one of 24 character strengths included in Peterson and Seligman's (2004) classification. Optimism, hope, future mindedness, and future orientation are used interchangeably to represent a cognitive, emotional, and motivational orientation toward the future, accompanied by the expectation that desired events and outcomes will occur (Peterson & Seligman, 2004). In fact, of all 24 character strengths, optimism had the highest partial correlation with life satisfaction (0.48–0.59 across three large samples, $p < 0.002$; Park, Peterson, & Seligman, 2004). Recent studies have shown that optimism is also positively associated with positive affect and negatively associated with negative affect and neuroticism (Littman-Ovadia & Lavy, 2012). Furthermore, studies suggest that optimism may hold promise in interventions directed at increasing well-being and decreasing undesired outcomes (Seligman, Schulman, DeRubeis, & Hollon, 1999; Seligman, Schulman, & Tryon, 2007).

However, most hope or optimism interventions have been designed for clinical populations. Lacking to date is a simple and easily available, self-applied intervention for the general population that offers a low cost-benefit ratio and explicitly focuses on fulfillment that presumably accompanies optimism (Peterson & Seligman, 2004). The main purpose of our study was to fill this

gap by developing a simple, self-applied, daily optimism intervention designed to enhance positive expectations about the near future, and to determine the intervention's effect on well-being. The second purpose of this study was to test and identify possible moderating effects of the intervention on participants' well-being. Finally, we were interested in exploring the contents people spontaneously mention at the end of the day when they contemplate what awaits them the next day, and whether these contents are related to the level of their dispositional optimism.

Optimism and the benefits of being optimistic

Being optimistic and hopeful is valued as strength in most cultures, and has recently been recognized as one of the transcendence strengths – strengths that forge connections to the larger universe and provide meaning (Peterson & Seligman, 2004). Optimism has been described as a dispositional global expectation that good things will be plentiful in the future and bad things scarce (Scheier & Carver, 1985), and hope as a character strength has been defined as 'expecting that desired events and outcomes will occur, (and) acting in ways believed to make them more likely' (Peterson & Seligman, 2004, p. 570). Not surprisingly, these conceptual siblings are highly related (Gallagher & Lopez, 2009 found that latent constructs of hope and optimism were correlated at $r = 0.66$), and they reflect a common general tendency to expect positive outcomes, in

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part because of one's expectation that he or she can control outcomes, and in part because of one's expectation that good things will occur. While we recognize that others have argued that hope and optimism may be somewhat different yet overlapping constructs (see Gallagher & Lopez, 2009; Snyder, 2000), the distinction between the two concepts is beyond the scope of the current study. Scheier and Carver's (1985) theory of optimism and Snyder's (2002) theory of hope share the underlying premise that positive expectancies can shape human behavior and produce positive outcomes, and indeed research has identified several benefits of being optimistic. Optimism has been linked to positive mood, perseverance in the face of adversity, popularity with peers, longevity (Peterson & Steen, 2002), active coping, effective problem-solving (Aspinwall, Richter, & Hoffmann, 2001), academic success, athletic achievement, various forms of social development, and general happiness (Peterson & Seligman, 2004; Snyder, 1994; Snyder & Lopez, 2002). Furthermore, optimism has been negatively related to depression, suicide, a sense of helplessness (Peterson & Seligman, 2004; Snyder, 1994; Snyder & Lopez, 2002), self-reported physical health symptoms (Scheier & Carver, 1985, 1987), likelihood of becoming ill, and severity of illness (Carver & Scheier, 2002; Scheier & Carver, 1985, 1987).

Implementing interventions to foster optimism

In recent years, much work has been done to develop and validate intervention processes that promote living a good and fulfilling life through the cultivation of character strengths (Snyder & Lopez, 2007). These interventions center on providing opportunities for the adoption of positive attitudes or orientations towards life (Peterson, Park, & Seligman, 2005). Seligman and his colleagues have developed several intervention exercises that have been found to be effective in lowering depressive symptoms and increasing happiness (Seligman, Rashid, & Parks, 2006). One of the most effective and well-known interventions is the *Three Good Things/ Blessings* exercise, in which participants are asked to write down each evening three good things that happened to them that day and to think of reasons as to why these things happened (Seligman, Steen, Park, & Peterson, 2005). The effectiveness of this count your blessings approach has also been supported by subsequent studies (e.g. Froh, Sefick, & Emmons, 2008). This intervention is considered a gratitude intervention, and is focused on past and present events, relations, and feelings. However, one could suggest a similar intervention focused on future events and activities, to be considered as an optimism intervention.

In line with (a) previous studies showing that, despite being a relatively stable personality trait (Peterson, 2000; Scheier & Carver, 1992), optimism is somewhat malleable and has been shown to be increased by interventions (Carver & Scheier, 2002), and (b) the finding that optimism, like gratitude, is one of the three character strengths robustly associated with life satisfaction, we aimed to develop an intervention for the purpose of enhancing optimism. We developed a daily intervention, suitable for everyone, which requires an investment of just a few minutes every evening. Instead of being grateful for past blessings (as in the *Count Your Blessing* intervention; Seligman et al., 2005), this intervention focuses participants' cognitions on the positive everyday things or events they can look forward to in their immediate future. Much like the *Count Your Blessing* (Seligman et al., 2005) and the *Beauty Logs* (Diessner, Rust, Solom, Frost, & Parsons, 2006) interventions, this intervention is designed to be a simple, self-applied, daily cognitive activity that does not require guidance or assistance of professionals, and has the potential of becoming a routine activity in everyday life.

Who benefits more from optimism interventions?

Regarding the question of who gains more from optimism interventions, two competing hypotheses were found relevant: the conductance hypothesis and the resistance hypothesis. The conductance hypothesis is based on Larsen and Ketelaar's (1991) findings that the effects of positive mood inductions were stronger for extroverts than for introverts, and the effects of negative mood inductions were stronger for those with higher neuroticism. According to this hypothesis, optimistic individuals are primed to experience and benefit from positive experiences. In contrast, McCullough, Tsang, and Emmons (2004) proposed the resistance hypothesis, theorizing that individuals who are predisposed to being optimistic may already experience the world in a positive light, and therefore no additional positive experiences (e.g. experiencing an optimism intervention) can lead to further benefits above and beyond what they normally experience.

Some support has been found for the resistance hypothesis in the context of gratitude induction. Rash, Matsuba, and Prkachin (2011) found that several of the psychological benefits of a gratitude intervention may be more strongly marked for individuals low in dispositional gratitude. We aim to explore these two competing hypotheses regarding dispositional optimism.

The present study: intervention, control group, and hypotheses

In this study, we developed and examined an original optimism intervention, comprised of quantitative

(counting/listing) and qualitative components (contemplation/imagination). Inclusion of the counting/ listing element was based on the *Count Your Blessings* intervention, which proved its effectiveness in increasing life satisfaction and positive emotions by increasing gratitude (Seligman et al., 2005). Therefore, in the first phase of our daily practice individuals think of, and then write down, three (positive) things waiting for them the next day. Inclusion of the contemplation/imagination element was influenced by the gratitude intervention recently reported as effective by Rash et al. (2011), who found that participants in the gratitude contemplation condition displayed higher levels of self-esteem and life satisfaction than participants in the memorable events condition. Therefore, in the second phase of our daily practice, individuals choose one of the three things contemplated in the first phase and try to experience and maintain sincere heart-felt feelings associated with it for five minutes, and then write down the experience. We expected that daily induction of optimism, both by counting and by contemplation, would improve well-being. Moreover, we aimed to test the effectiveness of our optimism intervention from a cognitive and emotional, as well as global perspective, without using depression measures, as our population was non-clinical. Specifically, we were interested in how inducing optimism would increase participants' optimism, positive affect, and life satisfaction, and simultaneously reduce their pessimism, negative affect, and emotional exhaustion.

Since the main interest in our study was the examination of positive-directed, rather than non-directed, immediate future anchors, the only distinction between the optimism condition and the control condition was the positive directedness of the former. Specifically, participants in both conditions received instructions that were identical except for the word *positive*, which was included only in the instructions for the optimism condition participants. Previous hope intervention studies used a variety of control conditions, such as listing daily hassles, the layout of a room, or what happened during the day. In these cases, it is unclear that these conditions produce the same psychological expectancy of change as do hope interventions. Furthermore, interventions such as listing daily hassles are thought to produce a negative psychological state (Froh, Kashdan, Ozimkowski, & Miller, 2009), and consequently may exaggerate outcome differences more than if more psychologically neutral control conditions are used. Support for our control group was recently given by Wood, Froh, and Geraghty (2010), who maintained that the 'best control groups are those that are identical in all aspects apart from the aspect of interest. In the absence of such control groups, it is difficult to evaluate the effectiveness of the … component of the intervention – compared to the other more generic aspects.' (p. 898).

We proposed three hypotheses. First, we predicted that participants in the optimism intervention condition would manifest increased levels of optimism, positive affect, and life satisfaction relative to participants in the control group. Second, we predicted that participants in the optimism intervention condition would manifest decreased levels of pessimism, negative affect, and emotional exhaustion (which is positively related to depression and considered as one of the main factors that lead to depression; Glass & McKnight, 1996), relative to participants in the control condition. Third, we also aimed to explore whether dispositional optimism/pessimism moderates the effects of the optimism intervention on optimism, pessimism, positive affect, negative affect, life satisfaction, and emotional exhaustion. Finally, to gain a broader understanding of the effects of our optimism intervention, we aimed to explore the kinds of items participants generate when they are asked to think about and write down the things that await them tomorrow. Therefore, we conducted a content analysis of the events and activities participants listed in the optimism intervention condition and in the control condition to identify common and different themes. The aim of the content analysis was twofold. First, to serve as a manipulation check for the various activities in the optimism intervention condition, and second, to reveal the types of future anchors people elicit by default in the control group when they think/imagine what awaits them the next day. To the best of our knowledge, this is the first study that addresses this aim in regard to optimism. Note that Rash et al. (2011) did so in the context of a gratitude intervention.

Method

Participants

Data for the current study were collected from a community-based sample. Ninety adults (35 males) were recruited from two universities (11 graduate students in psychology and 7 graduate students in business) and social networks in Israel. The average age of the sample was 28.1 years (SD = 6.87 years), with 65.6% having some post-secondary education. Participants were allocated into two groups (conditions), and there were no significant differences in gender, age, number of students, and years of education between them.

Thirteen participants dropped out of the study between the first and the second measurement; most did so immediately after being assigned the daily task. Seven dropped out of the optimism group and six dropped out of the control group. All 77 participants remaining in the study completed the task and questionnaires. Thirty-six participants were included in the optimism group and 41 in the control group. There were no significant differences in gender, age, years of education, or pretest

measures between those who remained and those who left the study.

Pre-intervention (T1), post-intervention (T2), and follow-up (T3) measures

Life Orientation Test-Revised (Scheier, Carver, & Bridges, *1994*)

The Life Orientation Test-Revised (LOT-R) is used to measure dispositional optimism and pessimism, defined in terms of generalized outcome expectancies. The LOT-R is comprised of 10 items: Three items assess generalized positive expectancies, such as 'In uncertain times, I expect the best' (optimism), three items assess generalized negative expectancies, such as 'If something can go wrong for me, it will' (pessimism), and four are filler items. These measures have been used extensively in research on the behavioral, affective, and health consequences of generalized optimism vs. pessimism (for evidence of convergent and divergent validity, see Scheier et al., *1994*; for theory and evidence of different kinds of optimistic thinking, see Armor & Taylor, *1998*; Epstein & Meier, *1989*). We found the LOT-R to have moderate reliability with pre-test alphas of 0.74 (optimism, or OP) and 0.59 (pessimism, or PE), post-test alphas of 0.76 (OP) and 0.68 (PE), and follow-up alphas of 0.84 (OP) and 0.71 (PE). We found a correlation of -0.48 between pre-test optimism and pessimism, which is consistent with previous findings of a small to moderate negative correlation between optimism and pessimism (See Herzberg, Glaesmer, & Hoyer, *2006*).

Positive and Negative Affect Scale (Watson, Clark, & Tellegen, *1988*)

The Positive and Negative Affect Scale (PANAS) measures the affective component of subjective well-being, and is comprised of 10 positive affect words (e.g. excited, proud) and 10 negative affect words (e.g. distressed, upset). Participants state whether they generally feel this way using a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Watson et al. (*1988*) found the PANAS to be reliable, with both convergent and discriminant validity. We also found it to have good reliability: pre-test alphas were 0.85 (positive affect, or PA) and 0.83 (negative affect, or NA), post-test alphas were 0.85 (PA) and 0.87 (NA), and follow-up alphas were 0.88 (PA) and 0.88 (NA). We found a correlation of -0.18 (ns) between pre-test PA and NA, which is consistent with Watson et al. (*1988*).

Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, *1985*)

The Satisfaction with Life Scale (SWLS) is a five-item scale that measures general life satisfaction. It includes items such as 'In most ways my life is close to my ideals.' Participants respond to these items using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Diener et al. (*1985*) found the SWLS to have good reliability and validity. We also found it to have good reliability: pre-test alpha was 0.85, post-test alpha was 0.91, and follow-up alpha was 0.92.

Emotional exhaustion

Emotional exhaustion is a subscale of the Burnout Measure (BM) (Pines & Aronson, *1988*). The BM includes 21 items that are used to measure the level of an individual's emotional, physical, and mental exhaustion (three dimensions) on 7-point frequency scales. The 11-item emotional exhaustion subscale has been shown to be the central, dominant, and most significant component of burnout and is the only intrinsic dimension (Evans & Fisher, *1993*). We found the emotional exhaustion subscale to have good reliability: pre-test, post-test, and follow-up alphas were 0.90, 0.89, and 0.88, respectively. In addition, we found a correlation of -0.49 between pre-test SWLS and emotional exhaustion.

Procedure

Potential recruits received contact information and an informed consent form. This study was advertised as the three future-anchors study designed to examine immediate future events. For their participation, the students among the recruits were told that they would receive two extra points on their final course grade, and the non-student participants were offered the chance of winning a family-size pizza. After completing the informed consent form, participants were approached via email and given a link to the online study. Participants were asked to provide some demographic information and to complete pretest questionnaires. After completing the pretest questionnaires, participants were randomly assigned to one of two intervention conditions (i.e. positive vs. neutral events) by an experimenter blind to the purpose of the study. For each condition, participants were given specific instructions online.

Data were collected at three time points. At the first time period (T1), the first round of personal and pretest measurements was collected. Then, participants were instructed to think about and describe three things or events that await them the next day. In the optimism intervention condition, participants received the following instruction: 'Think of three good things (items, people or events) waiting for you tomorrow. Write them down. Choose one of them and try to experience and maintain the sincere heart-felt feelings associated with it for 5 min.' After completing the task, participants were asked to write down their experiences and submit them

via the Internet. They were instructed to perform the task daily, over the next six evenings, for a total of seven days. In the control intervention condition, a similar procedure was used. Participants were instructed to 'think of three things (items, people or events) waiting for you tomorrow. Write them down. Choose one of them and try to experience and maintain the sincere heart-felt feelings associated with it for five min.' After completing the task, participants were asked to write down their experiences and submit them via the Internet. This process was to be repeated daily over the next six evenings, for a total of seven days. The experimenter contacted all participants by email and by text messages every evening during the seven-day intervention as a reminder. No participants reported concerns problems with the task, and all participants appeared to be complying with the procedure.

The second measurement (T2) took place immediately after participants completed the seven-day intervention component of the study; all participants completed the same battery of questionnaires as in the pretest. Upon completing their seven-day assignment, all participants were encouraged to continue with the task on their own. The third measurement (T3) took place one month after the participants completed the seven-day intervention. All participants completed the same battery of questionnaires as in the pre- and post-tests.

Results

Preliminary quantitative analyses

Table 1 shows the means and standard deviations for all scales used in this study for both the optimism and the control conditions. The correlations between the three positive initial measures ranged from 0.35 to 0.50, while the correlations between the three negative initial

Table 1. *Means* and *Standard Deviations* of outcome measures by condition and time-point.

	Pre		Post		Follow-up	
	M	SD	M	SD	M	SD
Optimism condition						
Satisfaction with life	4.66	1.03	4.60	1.37	4.74	1.31
Emotional exhaustion	3.03	0.85	2.77	0.89	2.54	0.85
Positive affect	3.68	0.61	3.48	0.74	3.64	0.70
Negative affect	2.53	0.69	2.14	0.72	2.11	0.65
Optimism	2.81	0.87	2.67	0.83	3.00	0.83
Pessimism	1.49	0.83	1.30	0.87	1.10	0.97
Control condition						
Satisfaction with life	4.72	1.18	4.53	1.26	4.69	1.13
Emotional exhaustion	2.84	0.90	2.78	0.82	2.86	0.86
Positive affect	3.59	0.72	3.50	0.61	3.60	0.63
Negative affect	2.54	0.73	2.35	0.69	2.54	0.74
Optimism	2.86	0.67	2.67	0.63	2.91	0.78
Pessimism	1.32	0.83	1.35	0.80	1.44	0.84

measures ranged from 0.29 to 0.61. For an initial examination of our hypotheses 1 and 2, we conducted a 2 (treatment group) X 3 (time of assessment) ANOVA with time of assessment as repeated measure. The results show treatment X time interactions for all the three undesired outcomes (pessimism, negative affect, and emotional exhaustion) ($F_{\text{Pessimism}} = 3.76$, $p < 0.05$; $F_{\text{NA}} = 3.68$, $p < 0.05$; $F_{\text{Emotional exhaustion}} = 4.68$, $p < 0.05$; $df = 2, 244$), but not for the three desired outcomes (optimism, positive affect, and life satisfaction). These preliminary results indicate that changes over time are dependent on the different treatment conditions, yet we suggest that modeling these dependencies requires a complete model rather than a variable by variable analysis, as described in the following section. In other words, we suggest that these results call for a more comprehensive model that not only averages the measurements over time, but looks at the potential trend by intervention group and by individuals.

Advanced statistical analysis

To investigate the change in the six outcome variables (optimism, pessimism, positive affect, negative affect, emotional exhaustion, and life satisfaction) over time and test hypotheses 1 to 3, we conducted longitudinal data analysis using the individual growth curve model (IGCM; Singer & Willett, 2003). This method represents a powerful means of assessing within-subject changes over time. IGCM offers several advantages over traditional MANOVA and ANCOVA models. For example, time can be measured either categorically or as a continuous variable, an individual growth pattern is measured together with the overall mean growth trend, and different covariance structures can be measured in order to estimate the model (DeLucia & Pitts, 2006; Lenzenweger, Johnson, & Willet, 2004). This model, which is an application of the multi-level model, includes two levels. Level 1 describes the change in individual participants' scores measured at three different time points: before the intervention (T1), at the end of the seven-day intervention (T2), and one month after the intervention ended (T3). Level 2 describes participants' initial level of optimism, which is time invariant (Level 2 variable), measured before the intervention.

Prior to the modeling stage, we examined the demographics of our participants and found no differences other than for gender. Men reported higher positive affect than women ($d = 0.47$, $p < 0.01$); no gender effect was found for any other scale. We also looked at other stratification possibilities such as education and age, but found no difference between the experimental and control groups. Therefore, only gender was incorporated in the final model.

Statistical modeling (shown in Tables 2–4) proceeded as follows. First, we estimated the unconditional mean

Table 2. Results of fitting a taxonomy of multilevel models for changes in optimism and pessimism.

		Optimism			Pessimism		
		Model 3	Model 4	Model 5	Model 3	Model 4	Model 5
Fixed effects							
Initial status	Intercept	2.79 (0.11)	2.84 (0.07)	2.84 (0.06)	1.31 (0.14)	1.33 (0.17)	1.32 (0.17)
	Group	−0.06 (0.19)	−0.01 (0.09)	−0.005 (0.08)	0.19 (0.19)	0.18 (0.17)	0.17 (0.17)
	Gender		−0.11 (0.08)	−0.12 (0.08)		−0.02 (0.18)	−0.01 (0.18)
	Optimism		1.01*** (0.07)	0.81*** (0.09)		−0.50*** (0.13)	−0.34 (0.21)
	Group × opt			0.34*** (0.09)			−0.29 (0.21)
Rate of change	Intercept	0.02 (0.07)	0.07 (0.07)	0.06 (0.07)	0.06 (0.09)	0.09 (0.11)	0.09 (0.11)
	Group	0.08 (0.11)	0.08 (0.10)	0.08 (0.10)	−0.27* (0.11)	−0.26* (0.11)	−0.25* (0.11)
	Gender		−0.06 (0.10)	−0.06 (0.10)		0.06 (0.09)	−0.05 (0.12)
	Optimism		−0.37*** (0.08)	−0.31** (0.12)		−0.05 (0.12)	−0.02 (0.14)
	Group × opt			−0.11 (0.13)			0.14 (0.16)
Variance components							
Level 1	Within person	0.25 (0.50)	0.21 (0.45)	0.19 (0.44)	0.24 (0.49)	0.24 (0.49)	0.24 (0.49)
Level 2	In initial status	0.44*** (0.66)	0.0003 (0.02)	0.001 (0.03)	0.50*** (0.71)	0.38*** (0.62)	0.36*** (0.60)
	In rate of change	0.12*** (0.34)	0.08*** (0.28)	0.09*** (0.29)	0.13 (0.36)	0.13 (0.36)	0.12*** (0.35)
	Covariance	−0.65	−0.59	−0.93	−0.49	−0.50	−0.49
Pseudo R^2 and goodness of fit	Unconditional ICC	0.38			0.46		
	$R^2_{y,\hat{y}}$	0.004	0.004	0.004	0.003	0.003	0.003
	R^2_ϵ	0.33	0.44	0.48	0.39	0.39	0.39
	R^2_0	0.003	0.999	0.998	0.02	0.26	0.29
	R^2_1	0.02	0.33	0.27	0.12	0.14	0.16
	Deviance⁺	491.46	369.34	358.68	516.48	497.23	495.25
	Dev. ΔX^{2+}	0.54	122.1***	10.66*	5.43	19.25***	1.98

Note: Standard errors are in parentheses for fixed effects and standard deviation for random parameters. Results with robust standard errors reported.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
Deviance+ measures how well data fit the model, and ΔX2 measures the improvement in the fit of the data to the model.

Table 3. Results of fitting a taxonomy of multilevel models for changes in positive and negative affect.

		Positive affect			Negative affect		
		Model 3	Model 4	Model 5	Model 3	Model 4	Model 5
Fixed effects							
Initial status	Intercept	3.56 (0.11)	3.81 (0.11)	3.81 (0.10)	2.47 (0.11)	2.38 (0.14)	2.37 (0.14)
	Group	0.06 (0.15)	0.16 (0.13)	0.16 (0.12)	-0.01 (0.16)	-0.05 (0.15)	-0.05 (0.15)
	Gender		-0.46^{***} (0.13)	-0.46^{***} (0.13)		0.18 (0.16)	0.19 (0.17)
	Optimism		0.45^{***} (0.09)	0.53^{***} (0.12)		-0.25^{*} (0.10)	-0.03 (0.16)
	Group × opt			-0.15 (0.17)			-0.38^{*} (0.15)
Rate of change	Intercept	0.01 (0.06)	-0.12^{*} (0.05)	-0.12^{*} (0.05)	0.003 (0.06)	0.06 (0.08)	0.06 (0.08)
	Group	-0.03 (0.08)	-0.07 (0.08)	-0.07 (0.08)	-0.21^{*} (0.09)	-0.20^{*} (0.08)	-0.20 (0.08)
	Gender		0.23^{**} (0.08)	0.23^{**} (0.08)		-0.10 (0.09)	-0.11 (0.09)
	Optimism		-0.08 (0.06)	-0.10 (0.09)		-0.03 (0.06)	-0.06 (-0.09)
	Group × opt			0.03 (0.10)			0.05 (0.10)
Variance components							
Level 1	Within person	0.25 (0.50)	0.23 (0.48)	0.23 (0.48)	0.23 (0.48)	0.23 (0.48)	0.23 (0.48)
Level 2	In initial status	0.23^{***} (0.48)	0.10^{***} (0.31)	0.10^{***} (0.31)	0.30^{***} (0.55)	0.26^{***} (0.51)	0.23^{***} (0.48)
	In rate of change	0.002 (0.05)	0.001 (0.03)	0.001(0.03)	0.03^{*} (0.17)	0.02 (0.16)	0.02^{*} (0.15)
	Covariance	-1.00	0.71	0.74	-0.44	-0.49	-0.47
Pseudo R^2 and goodness of fit							
	Unconditional ICC	0.43			0.47		
	$R^2_{y,y'}$	0.00008	0.00008	0.00008	0.011	0.011	0.011
	R^2_{ϵ}	0.01	0.07	0.07	0.23	0.23	0.23
	R^2_0	0.004	0.58	0.59	0.30	0.30	0.23
	R^2_1	0.06	0.62	0.59	0.04	0.03	0.02
	Deviance$^+$	422.51	385.91	384.75	439.32	427.36	422.04
	Dev. ΔX^{2+}	0.18	36.60^{***}	1.16	8.82^{*}	11.96^{*}	5.32

Note: Standard errors are in parentheses for fixed effects and standard deviation for random parameters. Results with robust standard errors reported.
$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.
Deviance+ measures how well data fits the model, and $\Delta X2$ measures the improvement in the fit of the data to the model.

Table 4. Results of fitting a taxonomy of multilevel models for changes in life satisfaction and emotional exhaustion.

		Life satisfaction			Emotional exhaustion		
		Model 3	Model 4	Model 5	Model 3	Model 4	Model 5
Fixed effects							
Initial status	Intercept	4.66 (0.20)	4.65 (0.25)	4.66 (0.25)	2.82 (0.14)	2.63 (0.19)	2.62 (0.18)
	Group	−0.03 (0.27)	−0.01 (0.26)	−0.002 (0.26)	0.21 (0.21)	0.12 (0.18)	0.11 (0.18)
	Gender		−0.003 (0.29)	−0.02 (0.28)		0.36 (0.20)	0.38 (0.20)
	Optimism		0.56** (0.19)	0.25 (0.30)		−0.56*** (0.12)	−0.25** (0.18)
	Group × opt			0.54 (0.31)			−0.52** (0.20)
Rate of change	Intercept	−0.01 (0.10)	−0.06 (0.12)	−0.07 (0.12)	0.01 (0.08)	0.06 (0.09)	0.07 (0.09)
	Group	0.07 (0.13)	0.05 (0.14)	0.05 (0.14)	−0.26* (0.10)	−0.24* (0.10)	−0.24* (0.10)
	Gender		0.10 (0.15)	0.10 (0.15)		−0.11 (0.11)	−0.11 (0.11)
	Optimism		−0.09 (0.09)	−0.02 (0.17)		0.06 (0.07)	0.03 (0.12)
	Group × opt			−0.08 (0.14)			0.06 (0.13)
Variance components							
Level 1	Within person	0.35 (0.60)	0.36 (0.60)	0.36 (0.60)	0.20 (0.44)	0.20 (0.44)	0.20 (0.44)
Level 2	In initial status	1.13*** (1.06)	0.97*** (0.98)	0.92*** (0.96)	0.67*** (0.82)	0.47*** (0.69)	0.43*** (0.65)
	In rate of change	0.17*** (0.41)	0.16*** (0.40)	0.16*** (0.40)	0.12*** (0.34)	0.11*** (0.33)	0.11*** (0.33)
	Covariance	−0.36	−0.33	−0.33	−0.60	−0.60	−0.61
Pseudo R^2 and goodness of fit							
	Unconditional ICC	0.64			0.54		
	$R^2_{y,y'}$	0.00005	0.00005	0.00005	0.011	0.011	0.011
	R^2_ϵ	0.32	0.32	0.32	0.43	0.43	0.43
	R^2_0	0	0.14	0.19	0.02	0.30	0.37
	R^2_1	0.01	0.04	0.04	0.13	0.16	0.17
	Deviance[+]	636.62	626.75	622.94	494.11	468.91	460.80
	Dev. ΔX^{2+}	0.26	9.87*	3.81	6.10*	25.20***	8.11

Note: Standard errors are in parentheses for fixed effects and standard deviation for random parameters. Results with robust standard errors reported.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
Deviance[+] measures how well data fits the model, and $\Delta X2$ measures the improvement in the fit of the data to the model.

model (Model 1, not shown), in which no other fixed effects were added. This step generated the unexplained variance that is to be explained in further models. We then estimated an unconditional growth model that included both fixed and random time effects (Model 2, not shown). These models (1 and 2), which are not shown due to space limitations, were used to calculate the ICCs (a measure of potential within-subject correlation) and pseudo-R^2s (a measure of the portion of the variation that is explained by the model), presented in Tables 2–4.

Next, we used an additive procedure to test Hypotheses 1–3. This procedure tests the interaction hypotheses in three steps. First, Model 3 tests H1 and H2, and presents the main effect of the independent variable, group intervention, and its interaction with time. Model 4 is an intermediate step in testing H3, which adds the co-variation between initial optimism and the dependent variables and their interactions with time, as well as gender, the single demographic variable for which we found differences. Finally, Model 5 supplements the earlier models with a three-way interaction between initial optimism, group, and time.

To test Hypothesis 3, we defined initial optimism ratings as an ordinal scale. We then used this ordinal scale as an independent variable to test its potential moderating effect on the change in the dependent variables over time. As all independent variables were centered around the mean, the intercept represents the level of an average participant.

Hypotheses testing

The results of the longitudinal data analysis using IGCM are presented in Tables 2–4. For the sake of convenience, we juxtaposed optimism with pessimism in Table 2, positive affect with negative affect in Table 3, and life satisfaction with emotional exhaustion in Table 4. Overall, the results show high intra-class correlations (ICC values) for all measures, which support the use of a multi-level model. Specifically, Table 2 compares optimism with pessimism, and shows that the unconditional mean models generate ICCs of 0.38 and 0.46, respectively. Table 3 compares positive affect with negative affect and shows ICCs of 0.43 and 0.47, respectively, and Table 4 compares life satisfaction with emotional exhaustion and shows ICCs of 0.64 and 0.54, respectively. As all ICCs are fairly high (ranging from 38% to 64%), we can conclude that the unexplained variance can be potentially explained by variability between participants, while the remaining variance is potentially explained by variation over time. Below are the full descriptions of the estimated fixed effects for the three pairs of dependent variables.

Changes in optimism and pessimism over time

As shown in Table 2, a significant interaction was found between time and intervention group for pessimism but not for optimism ($b = -0.27$, $p < 0.05$; Model 3). Compared to participants in the control condition, participants in the optimism condition tended to benefit over time from lower pessimism, but not from higher optimism. Therefore, our results offer support for Hypothesis 2, but not for Hypothesis 1. We can also see a positive interaction between initial optimism and group ($b = 0.34$, $p < 0.001$; Model 5). This result suggests that in the presence of initial higher optimism, the optimism intervention increased subsequent optimism levels, thus partially supporting Hypothesis 3. Additional results show that the higher the level of initial optimism, the higher the level of optimism over time ($b = 1.01$, $p < 0.001$; Model 4) and the lower the level of pessimism over time ($b = -0.50$, $p < 0.001$; Model 4). This suggests that initial optimism leads to increased optimism and decreased pessimism over time. We also found that initial optimism interacts with time, regardless of the group ($b = -0.37$, $p < 0.001$; Model 4), indicating that across the groups, optimism tended to diminish over time for those participants with higher initial optimism levels.

Changes in positive affect and negative affect over time

The results for positive affect and negative affect are shown in Table 3, and seem to follow the same pattern we found regarding optimism and pessimism. First, a significant interaction was found between time and intervention group for negative affect ($b = -0.21$, $p < 0.05$; Model 3), but not for positive affect. That is, participants in the optimism condition, compared to those in the control condition, tended to benefit from lower negative affect over time, but not from higher positive affect. Thus, here too we found support for Hypothesis 2 but not for Hypothesis 1. The results also show a significant interaction between initial optimism and group ($b = -0.38$, $p < 0.05$; Model 5). This result indicates that initial optimism moderated the group effect on negative affect. In the presence of initial higher optimism, the optimism intervention reduced subsequent negative affect, thus partially supporting Hypothesis 3. Additional results show that initial optimism plays a significant role for both positive affect and negative affect ($b = 0.45$, $p < 0.001$; $b = -0.25$, $p < 0.05$, respectively; see Model 4). When initial optimism is high, positive affect increased and negative affect decreased over time. Another effect that becomes significant is gender, although gender only affects positive affect ($b = -0.46$, $p < 0.01$; Model 4). While women report lower levels of positive affect, they are no different than men in their levels of negative affect. This difference, however,

diminished over time due to the positive interaction between gender and time ($b = 0.23$, $p < 0.05$; Model 4). That is, women reported lower positive affect only initially, but 'caught up' with the men over the course of the intervention.

Changes in life satisfaction and emotional exhaustion over time

The results for life satisfaction and emotional exhaustion are shown in Table 4. The results show that when the optimism intervention is practiced, the emotional exhaustion level decreased over time ($b = -0.26$, $p < 0.05$; Model 3, and consistent with Models 4 and 5), although this interaction is non-significant for satisfaction with life. As in the two previous cases, here too we found support for Hypothesis 2, but not for Hypothesis 1. In addition, the interaction between initial optimism and type of group is significant for emotional exhaustion ($b = -0.52$, $p < 0.01$; Model 5), but not for life satisfaction. Participants with higher initial optimism levels in the optimism condition tended to report lower emotional exhaustion. Here too we found partial support for Hypothesis 3 – that is, initial optimism moderated the relationship between intervention group and emotional exhaustion. Additional results show that for both life satisfaction and emotional exhaustion, initial optimism plays a significant role ($b = 0.56$, $p < 0.01$; $b = -0.56$, $p < 0.01$; Model 4). When initial optimism is high, life satisfaction increased and emotional exhaustion diminished over time.

Percent variance explained, Pseudo-R^2

In multi-level regression models, standard R-squared cannot be calculated directly. Instead, it is calculated from estimated variances. In this study, the *Pseudo-R^2*s in Tables 2–4 were calculated for each step in the modeling procedure in order to show how the percentage of unexplained variance is reduced by additional conditions (explanatory variables). In practice, the *Pseudo-R^2* of the current step is the variance of the earlier step less the variance of the current step. For example, for life satisfaction and emotional exhaustion (shown in Table 4), a very small percentage of the total variability was explained by fixed time ($R^2 \leq 1\%$), while 32% and 43% of the variability were explained by adding the within-participants change over time. When positive and negative affect were compared (Table 3), additional covariates made a crucial contribution to explained variance, as shown in Models 4 and 5. This trend seems stronger for positive affect than for negative affect, which indicates that negative affect tends to change over time while positive affect depends on initial personal characteristics, and individual change over time had a more limited lower

effect on the percentage of variance explained. Consistent with our findings so far, Table 2 shows that optimism and pessimism levels ($R^2 \geq 38\%$) are a major source of explained variance in the within-participant change over time, ignoring the 0.99 explained by initial optimism. These results should be interpreted with caution, as the high R^2 (0.99) was the result of this high correlation between the dependent and the independent variables.

Qualitative analysis of participants' anticipated activities

In the first step of the analysis, participants' descriptions of their positive or neutral expectations for the following day were divided into minimal content units such that each unit contained a single description of a future activity. This resulted in 1617 descriptions, of which 756 were obtained from participants in the optimism intervention condition and 861 from participants in the control condition. In the second step, common themes were identified by open-coding participants' descriptions; 20 categories were generated based on these themes. For example, descriptions of activities such as 'take an afternoon nap' were assigned to the category of rest; descriptions such as 'spending the morning at the beach' were assigned to the category of everyday pleasures; descriptions such as 'clean the house' were assigned to the category description of household tasks; descriptions such as 'summarize a paper for an exam' were assigned to the category description of School Tasks.

Two judges (the second author and a MA psychology student) independently sorted the descriptions into the various content categories, achieving good inter-rater reliability, *Kappa* = 0.83. Differences were resolved through discussion. Next, categories that did not reach the threshold of 2% of the total descriptions were incorporated into related categories. For example, 'Finance-related tasks' and 'Childcare-related tasks' were incorporated into Household Tasks. This resulted in a set of 13 categories of future activity descriptions. In the final step, thematic meta-categories of the descriptions were created, resulting in four such categories. Two research assistants (with MA degrees in psychology), not involved in the earlier stages of the study, were presented with the 13 categories and assigned each to one of the four meta-categories. There was full agreement between the two judges. These final four meta-categories were: (1) relationship activities, which combined the three categories of activities with family, activities with partner, and activities with friends; (2) pleasurable activities, which encompassed the five categories of sports and hobbies, rest, everyday pleasures, enjoyable tasks, and special events; (3) everyday tasks – to-do list, which grouped household tasks, food-related tasks, and errands; and (4) work/school activities, which combined, work
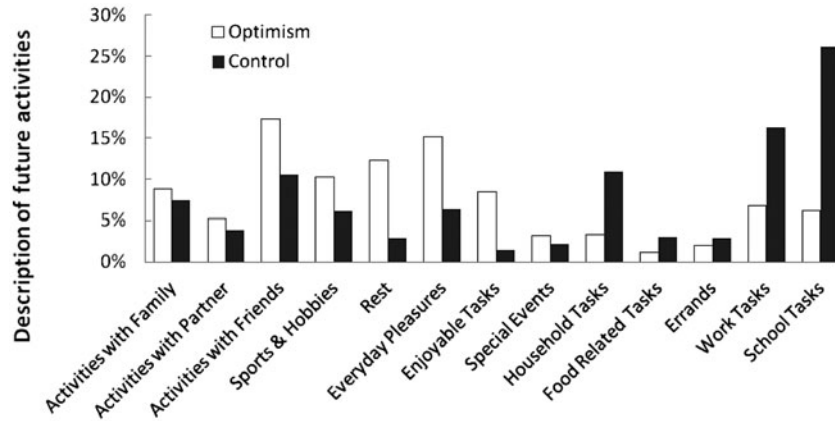
Figure 1. Descriptions of future activities per category for the optimism and control groups.

tasks and school tasks. Figure 1 presents the frequency of descriptions for the optimism and control conditions across all 13 categories.

Our intervention groups were compared by the frequency of expected activities listed for each of the 13 initial categories and the subsequent four meta-categories. To do so, we conducted a set of non-parametric Mann-Whitney tests (M-W). The M-W bases its comparative score on the aggregated ranking score of each group, rather than on the mean difference used in a standard *t*-test. Table 5 shows the initial 13 categories, examples for each category, the four meta-categories, the frequency means for both the optimism and the control group, and *z* scores comparing the groups.

Significant group differences were found in several categories. Activities with friends, rest, everyday pleasures, and enjoyable tasks were significantly more frequently represented in the optimism condition than in the control condition ($z = -2.64$, $p < 0.001$; $z = -4.71$, $p < 0.001$; $z = -4.54$, $p < 0.001$; $z = -5.06$, $p < 0.001$), while household tasks, work tasks, and school tasks were significantly more frequently represented in the control condition than in the optimism condition ($z = -4.05$, $p < 0.001$; $z = -3.41$, $p < 0.01$; $z = -5.23$, $p < 0.001$). Interestingly, we did not see significant differences between the groups in reference to the represented frequencies of activities with family, activities with partner, sports and hobbies, special events, food-related tasks,

Table 5. Thematic categories of participants' future activities, mean difference between optimism and control groups and Mann–Whitney *U* test.

Meta-categories and categories	Examples	Optimism-control *mean difference*	Z-score
Relationship activities		*1.99*	*−3.54****
Activities with family	Have lunch with my mom; visit my family	0.30	−1.24
Activities with partner	Go out with my husband; meet my boyfriend	0.28	−1.49
Activities with friends	A night out with my friends; meet friends I have not seen in two weeks	1.42	−2.64**
Pleasurable activities		*6.40*	*−6.17****
Sports and hobbies	Go to the gym; play soccer	0.87	−1.83
Rest	Sleep in late; have a quiet restful afternoon	1.97	−4.71***
Everyday pleasures	Enjoy the beach and sun; tomorrow morning we will wake up to freshly baked bread	1.85	−4.54***
Enjoyable tasks	I will finally submit my project!!; groom our new dog	1.49	−5.06***
Special events	My cousin's wedding; holiday dinner	0.23	−1.47
Everyday tasks – 'to do list'		*−2.13*	*−4.41****
Household tasks	Clean the house; do the laundry	−1.57	−4.05***
Food related tasks	Make dinner; buy groceries	−0.38	−1.82
Errands	Get the car cleaned; go to the post office	−0.17	−1.27
Work/school tasks		*−6.11*	*−6.39****
Work tasks	Finish the report on employee working-hours; get a document from the accounting department	−1.97	−3.41**
School tasks	Study for an exam in sociology; do the exercises in statistics	−4.14	−5.23***

Note: *p < 0.05; **p < 0.01; ***p < 0.001.

and errands. It seems that the allure of thinking of future activities with one's partner and family is strong enough to elicit such cognitions even with a neutral stimulation. Sports and hobbies and special events may be elicited neutrally because sports and hobbies are often structured into the week, and special events are relatively salient and outstanding by definition, and therefore easily recalled. Finally, in the case of food-related tasks and errands, perhaps some errands and food-related tasks are perceived as more pleasurable (e.g. 'Go to the video store'), while others are considered obligations (e.g. 'Pick up clothes from dry-cleaning'). As for the meta-categories, relationship activities and pleasurable activities were significantly more frequently represented in the optimism condition than in the control condition ($z = -3.54$, $p < 0.001$; $z = -6.17$, $p < 0.001$), and everyday tasks – to-do list and work/school tasks were significantly more frequently represented in the neutral condition than in the optimism condition ($z = -4.41$, $p < 0.001$; $z = -6.39$, $p < 0.001$).

Overall, 72% of activities in the optimism condition focused on relationships and pleasures, whereas only 28% focused on duties and work. However, in the control condition only 39% of activities focused on relationships and pleasures, and 61% focused on duties and work. It is important to note that no significant differences were found in category types between participants with higher or lower initial optimism (neither for the four meta-categories nor for an even broader classification of hedonistic activities vs. duties). This was the case for the optimism group, the control group, and for both groups combined. Similarly, no such differences were found for those with higher or lower initial pessimism. In other words, the differences between the groups can be traced to the optimism intervention rather than to participants' dispositional optimistic or pessimistic tendencies.

Summary of results

Overall, the results of our quantitative analyses did not support Hypothesis 1. That is, the optimism intervention did not increase optimism, positive affect, or life satisfaction over time or relative to the control condition. The model does however support Hypothesis 2: the significant interaction that was found between the different conditions (optimism vs. control) and time indicates that the optimism condition reduced pessimism, negative affect, and emotional exhaustion over time. The significant reduction in these undesired outcomes emerged immediately after the seven-day intervention (T2), and persisted over time until T3. Finally, the IGCM model only partially supported Hypothesis 3. Initial levels of optimism moderated the effect of the two alternative conditions, however only on emotional exhaustion,

negative affect, and optimism. Specifically, higher optimism levels at T1 increased the effect of the optimism condition by reducing emotional exhaustion and negative affect, and by increasing optimism.

The results of the content analysis show that 72% of activities in the optimism condition focused on relationships and pleasure, whereas only 28% focused on duties and work. While the distribution of the various activities within the optimism condition is of interest primarily as a research manipulation, the distribution in the control condition provides information beyond the manipulation check. The distribution revealed the anchors people elicit by default when they think/imagine what awaits them the next day. Sixty-one percent of the activities mentioned by control group participants were activities that focused on duties and work, while the remaining 39% were activities focused on relationships and pleasure. No correlation was found between initial optimism or pessimism and the type of activities raised.

Discussion

This study demonstrated that a simple self-applied exercise practiced on a daily basis can reduce pessimism, negative affect, and emotional exhaustion, and that these benefits persist up to one month following seven days of practice. In comparison to the control intervention, individual growth curve modeling revealed that individuals who practiced the optimism intervention were less pessimistic, and experienced less negative affect and emotional exhaustion, although they were not more optimistic, and did not experience increased positive affect or life satisfaction following the exercise period. Individual growth curve modeling also showed that these improvements in the negative outcomes were moderated by participants' initial levels of optimism. That is, high optimistic individuals benefited more from the optimism intervention, and experienced a greater reduction in emotional exhaustion and negative affect, and a greater increase in optimism.

The positive, future-oriented, active elements in our optimism intervention may have contributed to its efficacy by creating positive immediate future anchors. The term 'creating' is not accidental, because one interesting finding that emanated from spontaneous comments of several study participants was that when a person was unable to summon up three good things waiting for her tomorrow, she actively devised positive events that she could initiate (e.g. invite spouse to movie). Therefore, the optimism exercise reduces pessimism, negative affect, and emotional exhaustion, both by teaching individuals to focus on and imagine positive routine/small/ simple daily events/activities that await them in the very near future (the next day), and by encouraging behaviors that initiated such positive events. These results are in line with previous findings that show that optimistic

thinking can have advantageous psychological benefits (King, 2001; Shapira & Mongrain, 2010). The results are also consistent with broaden and build theory, which suggests that positive mind states increase engagement, coping, and the creation of favorable situations ('broaden'), which in turn increase one's capacity to counteract negative feelings ('build') (Fredrickson, 1998). These results are not in line with previous findings that show that optimism interventions enhance desired outcomes, such as positive mood and perseverance in the face of adversity (Peterson & Steen, 2002). However, they are consistent with findings concerning the reduction of undesired outcomes, such as depression, suicide, a sense of helplessness (Peterson & Seligman, 2004; Snyder, 1994; Snyder & Lopez, 2002), and severity of illness (Carver & Scheier, 2002; Scheier & Carver, 1985, 1987).

There are several possible reasons for the current non-significant changes in optimism, positive affect, and life satisfaction in the optimism group, such as the nature of the current sample, the modality of the intervention, and its specific contribution. The sample size was rather small in total and the 77 final participants are on average relatively well-educated, high functioning, and satisfied to begin with, and therefore it is possible that their potential for increased optimism was limited. It is also possible that this specific intervention may be more useful as a modular exercise used in psychotherapy guided by a clinician. However, the reduction in pessimism, negative affect, and emotional exhaustion in the optimism group might indicate that anticipated positive events are taken for granted when thinking about the next day, and thus replacing automatically by anticipated duties and to-do lists. Finally, as recently mentioned by Peterson (2013), 'What is good in life is not simply the absence of what is problematic. We all know the difference between not being depressed and bouncing out of bed in the morning with enthusiasm for the day ahead.' (p. 4) Therefore, maybe our intervention is more beneficial for reducing negative feelings and cognitions than for increasing positive feelings and cognitions.

We also explored whether dispositional optimism would influence outcomes. Specifically, we explored who benefits more from the optimism intervention, those with initial higher optimism or those with lower initial optimism. Our findings only partially support our prediction regarding moderation. We found that initial levels of optimism moderated the intervention condition effect on emotional exhaustion, negative affect, and optimism. Specifically, higher initial optimism levels increased the effect of the optimism condition, but not the effect of the control condition, by diminishing emotional exhaustion and negative affect, and by increasing optimism immediately after the seven-day intervention, and one month later as well. Thus, we found some evidence for the superiority

of the optimism intervention for optimistic participants. This finding is consistent with the conductance hypothesis (Larsen & Ketelaar, 1991), which proposes that optimistic people are 'primed' to experience and benefit from positive experiences more than people with low proclivity towards optimism. This finding is inconsistent with the resistance hypothesis (McCullough et al., 2004), which posits that those who are predisposed to being optimistic may already experience the world in a positive light, and therefore no additional positive experiences could lead to further benefits above and beyond what they normally experience. The resistance hypothesis has been recently supported regarding gratitude – another character strength from the transcendence category. Rash et al. (2011) showed that a gratitude intervention helped participants with low dispositional gratitude, but had no effect on participants high in dispositional gratitude. Perhaps, the differences in findings are due to the difference between the memory function and the imagination function. Whereas gratitude induction is based on the memory of what was or what exists (past or present), optimism induction is based on imagination of what could be in the future. Memory and imagination are not completely identical brain functions although recent studies in neurobiology have found that the hippocampus may be as important for imagining the future as it is for remembering the past (Addis, Wong, & Schacter, 2008). Perhaps, one of the most fascinating features of the human mind is the ability to direct one's attention away from the immediate environment and toward a hypothetical scenario or episode (Schacter & Addis, 2008). The relatively new field of *episodic future thought* has received a considerable amount of attention by neuroscientists (for a detailed review see, Schacter & Addis, 2008), and only recently have psychology researchers begun to consider the underlying nature of the ability to envision specific personal episodes in the future. We hope that the present study signals the entry of positive psychology researchers into this field, which appears to have significant potential for processes of change, growth, and prosperity.

The content analysis of responses revealed, for the first time to our knowledge, interesting findings regarding the immediate future anchors that people elicit spontaneously. In the absence of explicit guidance suggesting positive future anchors, we found that people tend to list daily hassles, duties, inconveniences, and burdensome tasks they are obligated to perform. Apparently, the default mode of contemplating about upcoming events in the immediate future is thinking about a list of duties and tasks to be performed, which may trigger negative emotions. This could explain our findings concerning the optimism intervention's influence: when the list of duties is replaced by a list of pleasures, a decline in negative emotions, rather than an increase in positive emotions, appears.

With regard to initial optimism, it should be emphasized that no differences were found between participants with higher or lower initial optimism/pessimism for category types, or for an even broader classification of hedonistic activities vs. duties. In other words, the optimism intervention created the differences between the groups and not participants' dispositional optimistic or pessimistic tendencies. This suggests that if people are neutrally instructed to think of the next day's activities and events, regardless of their dispositional optimism or pessimism, they tend to gravitate towards thinking in terms of their to-do list related to their household and work/school obligations, and less on pleasurable and relationship activities. However, if people are directed to think of the next day's positive activities and events, as in the optimism condition, they tend to focus less on their household and work/school obligations, and more on life pleasures and spending time with loved ones.

These findings should be interpreted in light of the study's limitations. First, this study has no no-treatment or waiting list control. The inclusion of a second control group, no-treatment, or waiting list control group, would have improved our design by allowing us to answer the research question: Is the optimism intervention preferable to doing nothing at all? (Wood & Tarrier, 2010). Wood et al. (2010) stated in their review that a no-treatment control group would be a better option than a counting hassles control condition, which may contain some similarities to our control condition. We believe that our control condition is probably better than a no-treatment control group, but conclusions from our study would have been more straightforward if all three conditions were included. Although unlikely, it is possible that our control condition was either decreasing or inhibiting desired outcomes, and thus we cannot be completely sure whether or not it was our optimism intervention that was enhancing outcomes, or it was the control condition that was inhibiting well-being, or a little of both. Nevertheless, our control group actually may be seen as a 'natural' control condition, representing what people naturally focus on when they think about the following day's activities. As such, though it may not be truly a 'neutral' comparison, it does have strong ecological validity, because it represents what happens naturally in the absence of intervening. The findings that our optimism intervention improves outcomes over 'natural' comparison, suggest that the normal state of affairs is that people slide into task worry, stress, and negativity when left to their own devices. However, a third condition that is 'neutral' would be very informative, and should be included in future studies

This study is also limited by its reliance on a small relatively educated sample, and future research on larger and more diverse samples is important for determining the generalizability of the findings. Nonetheless, the results contribute to the emergence of scientific understanding of the nature of spontaneous thoughts people have about their personal near future, and they provide critically important information for educators and clinicians attempting to understand and reduce undesired feelings.

Acknowledgment

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