

Testing Strengths-Based Interventions: A Preliminary Study on the Effectiveness of a Program Targeting Curiosity, Gratitude, Hope, Humor, and Zest for Enhancing Life Satisfaction

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Abstract The study compares the impact of character strengths-based positive interventions in a sample of 178 adults. An experimental group that trained strengths of the Values-in-Action classification that typically correlate highly with life satisfaction (curiosity, gratitude, hope, humor, and zest) was compared in its gain in life satisfaction with a group that trained strengths that usually demonstrate low correlations with life satisfaction (appreciation of beauty and excellence, creativity, kindness, love of learning, and perspective) and a wait-list control group. If pre and post measures in life satisfaction were compared, the group with the strengths most correlated with life satisfaction improved significantly (statistically) in their satisfaction in comparison to a control group. This could be interpreted as support for the idea that primarily those strengths that correlate highly with life satisfaction should be addressed in strengths-based interventions. When asked for subjective ratings of well-being after the interventions concluded, participants in both intervention groups indicated gains above that of a wait-listed control group. Further analyses underscore the special role of self-regulation in facilitating success in the interventions. Overall, the data underline the potential of strength-based interventions for improving human well-being.

Keywords Character strengths · Positive psychology · Positive interventions · Strengths based intervention · VIA-IS

1 Introduction

Positive psychology has been defined as the scientific study of what is best in people and of characteristics and conditions of life that contribute to the *good life* (Seligman and Csikszentmihalyi 2000). One of the aims of this line of research is studying deliberate interventions that facilitate well-being. Sin and Lyubomirsky (2009) define positive interventions as “treatment methods or intentional activities aimed at cultivating positive

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feelings, positive behaviors, or positive cognitions” (p. 467). Such interventions can range from single actions (e.g., counting acts of kindness) to large-scale programs over a time span of many months (e.g., Emmons and Crumpler 2000; Lyubomirsky et al. 2005; Mazzuchelli et al. 2010; Otake et al. 2006; Seligman et al. 2005). Sin and Lyubomirsky’s (2009) recent meta-analysis shows that positive interventions are effective in enhancing well-being and alleviating depression.

1.1 Positive Interventions

Lyubomirsky et al. (2005) argue that there are three major factors that relate to a person’s happiness; i.e., (a) a genetically determined set-point; (b) circumstantial factors (e.g., income or education); and (c) activities and practices that relate to happiness. Deliberate interventions address the latter point. The present study investigates *strength*-based interventions as intentional activities (mainly behavioral and cognitive) that may have a positive impact on people’s satisfaction with life (SWL). Seligman (2011) argues that pursuing one’s characteristic strengths (so-called “signature strengths”, the personally highest strengths), “leads to more positive emotion, to more meaning, to more accomplishment, and to better relationships” (p. 24). In his well-being theory, the strengths serve as the underpinnings of the five elements of the theory (i.e., positive emotion, engagement, relationships, meaning, and achievement). Thus, while it is not expected that each of the strengths is based on one single mechanism that facilitates well-being, one might argue that the strengths serve as lubricants for enabling positive psychological functioning in this sense.

1.2 Character Strengths and Life Satisfaction

The framework of this study is Peterson and Seligman’s (2004) *Values in Action* (VIA) classification of twenty-four character strengths (e.g., fairness, leadership, or self-regulation) and six virtues (wisdom and knowledge, courage, humanity, justice, temperance, and transcendence). Each of the strengths is assigned to one of the hierarchically higher ordered virtues. Strengths are seen as the route for displaying one of the virtues; e.g., *humanity* can be achieved by the display of love (valuing close relations with others), kindness (doing favors and good deeds for others), and social intelligence (being aware of the motives and feelings of self and others). Peterson and Seligman derived their classification from an extensive review of literature in different areas (e.g., philosophy, popular culture, psychology, or religion). They set up several criteria that had to be met in order for a trait to be included in the classification (e.g., it is fulfilling; it is morally valued in its own right; its display does not diminish others, etc.). This classification allows describing and studying the “good character,” which enables pleasure, engagement, and more generally speaking positive experiences (Peterson et al. 2007; Seligman 2011).

Park et al. (2004) found that the strengths of curiosity, gratitude, hope, love, and zest out of the VIA-classification were most strongly correlated with SWL. Further, they refer to the character strengths’ contribution to (psychological) fulfillment and suggest that primarily these strengths should be targeted when conducting interventions to promote well-being (see also Park and Peterson 2008). Although the findings by Park et al. (2004) have been replicated in correlational studies across different samples, countries, age groups, and measures (e.g., Gander et al. *in press*; Khumalo et al. 2008; Park and Peterson 2006a, b; Park et al. 2004; Peterson et al. 2007; Proyer et al. 2011; Ruch et al. 2010a, b, c, d), there are no empirical data on whether experimentally addressing specific strengths (i.e., those

with high correlations with SWL) in interventions truly enhances life satisfaction. The main aim of this study was narrowing this gap in the literature.

1.3 An Experimental Approach in Studying Strength-based Interventions

In the current study an experimental group (EG) underwent interventions on the strengths most correlated with life satisfaction.¹ In this group, participants underwent interventions on four of the five strengths identified by Park et al. (2004) to be most strongly correlated with SWL; i.e., curiosity, gratitude, hope, and zest. Although Park et al. also identified love in their “top five,” we decided for a *humor*-based intervention. This decision was made because humor is also among the highest ranked strengths (typically ranked around seventh in regard of its correlations with SWL). Correlation coefficients among the strengths that correlate numerically highest (within the range where humor lies) usually do not significantly differ from each other. Furthermore, Park et al. (2006) found that humor was one of the strengths, out of the VIA classification, that was weighted highest in a multinational study involving fifty-four nations (in terms of highest mean scores; i.e., strong endorsement). Additionally, there is literature available that addresses either the role of humor in positive psychology or on humor-based interventions and that could be used for developing the intervention used in this study and as a theoretical background (e.g., Beermann and Ruch 2009; Müller and Ruch 2011; Ruch 2008; Ruch et al. 2010c, d, 2011, in prep). Finally, humor has also been favored as there was a fully pre-tested intervention available that could be adapted for the purpose of this study while a love-based intervention would have had to be newly developed and pre-tested (see McGhee 2010; Ruch et al. in prep). Given restrictions in available funding, resources, and time, we decided for the humor-based intervention.

Besides the group that we trained with the strengths most correlated with SWL (curiosity, gratitude, hope, zest, and, additionally, humor), two other groups entered the study: (a) a *control-group* (CG1²) that was trained with five strengths with typically low correlations with life satisfaction (i.e., appreciation of beauty and excellence, creativity, kindness, or love of learning), and (b) a *waiting group* (CG2) that did not receive training with strengths (or any other intervention) until after this experiment was concluded. Participants in this study completed Diener et al.’s (1985) *Satisfaction with Life Scale* before and after the interventions for testing effects of the program on the cognitive component of subjective well-being. Additionally, they completed single item ratings after the program for their perceived change in cheerfulness, happiness, positive mood, and satisfaction with life. This enables a direct estimate of the participant’s experience with the program and on whether they personally felt that something has changed after completion of the program. In addition with the findings from the life satisfaction scale this provides a fuller picture on the perceived effects of the program. Also, we were interested in testing whether the participants truly experience a change in life satisfaction due to the program and whether any changes could be found for other components of well-being such as the positive affect.

The main hypothesis in this study was that an intervention targeting specific strengths would lead to an increase in SWL compared to a pretest. Following Park et al. (2004) and

¹ We focus on life satisfaction as the cognitive component of subjective well-being only and aim at studying the contribution of strength-based interventions on the individual’s fulfillment.

² It is acknowledged that labeling this group as “control group” may technically not be fully correct but we wanted to express that is a *control* group for the effects of the intervention in the highly correlated strengths group.

Peterson and Seligman (2004), we expected particularly that (a) the group that trained with the strengths most related to life satisfaction (including humor) would show an increase in life satisfaction after the interventions (within group comparison); (b) the group with interventions on the strengths known to have lower correlations with SWL would also gain in life satisfaction (within group comparison); (c) both intervention groups would show higher gains in SWL than a control group receiving no intervention (waiting group); and (d) the increase in life satisfaction would be stronger in the group with the strengths most related to life satisfaction compared to the other group that underwent interventions.

This study also allows answering a variety of related research questions. For example, whether *specific strengths* facilitate (or inhibit) success in the program (i.e., experience a gain in SWL). The question is whether people benefit more (less) from interventions that are congruent with their individual profile (cf. Lyubomirsky et al. 2005). One might argue that the application of strengths that one possesses, such as one's signature strengths (see Mitchell et al. 2009; Seligman et al. 2005), facilitates the experience of positive emotions more, which, in turn, could have beneficial effects on a person's well-being (Fredrickson 2001). However, one might also argue that only a low expression (i.e., strengths that are ranked low on one's individual VIA profile) would allow for an improvement and that, therefore, those with lower expressions in the respective strength would gain more strongly from the intervention. As the strengths for inclusion in the VIA-classification were selected from a theoretical point of view (Peterson and Seligman 2004) and as it is not expected that the mechanisms behind each of the strengths is the same, interactions or other patterns might apply (e.g., training with some strengths that are ranked low for an individual may show more benefit in SWL than training with their signature strengths; however, it could also be vice versa for other strengths).

Taken together, the aims of the present study were threefold. First, testing whether experimental manipulations of strengths that typically correlate highly with satisfaction with life (EG) lead to increases of life satisfaction. It was also tested, whether those increases exceeded those in a group that underwent interventions that addressed strengths with lower correlations with SWL (CG1) and a waiting group without any interventions (CG2). Second, studying the role of character strengths on changes in life satisfaction. Participants also completed the VIA-IS before and after the program. It was expected that interventions congruent with the individual profile facilitate greater gains in life satisfaction as they allow exerting one's signature strengths. Hence, the VIA-IS at baseline but also VIA-IS difference scores (after the intervention in comparison with before the intervention) were related to SWL. This allows testing to what degree strengths of character can be determinants of the success in the intervention. Third, the participant's self-perception of the effects of the interventions were tested (by using four single item self-evaluations). Life satisfaction is, of course, not the only criterion for evaluating the usefulness of an intervention—for example, elevation of positive mood or greater cheerfulness are also desirable outcomes. Thus, this research question focuses on the effects of the trainings for different aspects of a person's well-being apart from life satisfaction as assessed with Diener et al.'s (1985) Satisfaction with Life scale. It was expected that all kinds of strengths-based interventions (irrelevant of their relation to satisfaction with life) contribute to positive changes in various indicators of the participants' well-being (such as cheerfulness, "happiness", or positive mood). When analyzing the data, first results for Diener et al.'s (1985) Satisfaction with Life Scale will be reported. Next, determinants for the success in the interventions will be tested by relating change scores in the life satisfaction scale with initial levels and change scores in character strengths. In a final step of

the analysis, the self-evaluations will be analyzed and compared between all groups that entered the study.

2 Method

2.1 Participants

The total sample consisted of 178 adults ($n = 73$ males, $n = 105$ females). They were between 18 and 76 years ($M = 41.20$, $SD = 13.08$). About one-third was married (32.0 %), 11.8 % were not married but lived with a partner, 15.7 % were in a partnership but did not live together, 27.0 % were single, 11.2 % were separated or divorced, and 2.2 % were widowed. Slightly more than half did not have children (55.6 %) and the others had between one (8.0 %) and four (3.4 %) children (two did not provide information on their parenthood). Close to half of them (45.3 %) had completed vocational training and close to one quarter each had either completed a University or a University of Applied Sciences degree. More than three quarters (79.1 %) were employed, 7.0 % were retired, and 6.4 % were homemakers.

The *experimental group* (EG) consisted of $n = 56$ participants ($M = 43.73$, $SD = 13.30$), 62 participants were in the first control group (CG1, $M = 39.18$, $SD = 13.62$), and 60 were in the second control group (CG2, $M = 38.71$, $SD = 12.00$). An ANOVA with age as dependent variable indicated that the three groups did not differ regarding their mean age ($F[2, 166] = 1.97$, $p = .14$). Furthermore, the male : female ratio was equal in the three groups ($\chi^2 [1, N = 178] = 0.69$, $p = .71$); there were 37.5, 40.3, and 45.0 % males in the EG, CG1, and in the CG2, respectively.

2.2 Instruments

The *Values in Action Inventory of Strengths* (VIA-IS; Peterson et al. 2005) consists of 240 items for the self-assessment of the 24 character strengths (10 items per strength) included in the classification scheme of Peterson and Seligman (2004). The VIA-IS uses a 5-point Likert-scale (from 1 = “very much like me” through 5 = “very much unlike me”). A sample item is “I never quit a task before it is done” (persistence). We used the German version (Ruch et al. 2010a, b, c, d) that has comparable psychometric properties, factorial structure, and demonstrated comparable correlates with other measures (e.g., on SWL) to the US-version. For example, Ruch et al. report for the construction sample a median alpha-coefficient of 0.77 and a test–retest correlation of 0.73 (median) for a 9-months interval. There, self- and peer-ratings of strengths correlated in the expected range (median = 0.40). The German VIA-IS has already been used in several studies (e.g., Gander et al. in press; Peterson et al. 2007; Proyer and Ruch 2009; Proyer et al. 2011). Alpha coefficients in the present sample were between 0.67 (honesty) and 0.89 (creativity) with a median of 0.75.

The *Satisfaction with Life Scale* (SWLS; Diener et al. 1985) is a 5-item measure (e.g., “The conditions of my life are excellent”) of satisfaction with life in the sense of a global cognitive judgment of one’s own life. Answers are given on a 7-point Likert-scale (from “strongly disagree” to “strongly agree”). The SWLS yielded a high internal consistency in the present sample ($\alpha = 0.85$). The scale is widely used and demonstrates good psychometric properties across different studies (e.g., Diener 1994; Diener et al. 2000). We used a

German version that has already been used in earlier studies (e.g., Peterson et al. 2007; Ruch et al. 2010a, b, c, d).

Participants filled in a *self-evaluation sheet* after the completion of the program. They rated on a 7-point scale from 1 (=weaker) to 4 (=no change) to 7 (=stronger), whether they felt any changes compared to the time before the interventions and if so in what direction. Both intervention groups rated the five strengths trained in the EG and the five strengths trained in CG1 and, additionally, they provided ratings for their sense of change in *cheerfulness*, *happiness*, *positive mood*, and *satisfaction with life*. Thus this self-evaluation sheet had 14 relatively unrelated questions (i.e., single-item indicators of change due to the program), and, therefore, we cannot address its reliability. This sheet has been compiled particularly for this study.

2.3 Procedure

We initiated the *Zurich Strengths Program* (Z.S.P.) for the realization of the interventions. Participants were recruited from the general adult population but we did not accept students of psychology. Overall, only a small number of students (about 7 %) participated in the program. The Z.S.P. was open to everyone with the exception of people who indicated that they currently undergo psychotherapeutic treatment or psychiatric treatment, as well as currently using psychotropic drugs (exclusion criteria). The participants neither paid for taking part in the program (all materials were given to them for free) nor were they paid for joining the Z.S.P. However, they had to agree to attend group meetings at the department and complete work at home. They received a feedback on their individual results after completion of the *full* program.

Participants were approached via short reports in local newspapers and on the website of the institution where the study has been conducted. The short reports dealt with strengths of character and the program was advertised as “train your strengths.” Participants were randomly assigned to one of three groups. They were “blind” in so far as they did not know that there were two groups with different interventions and, of course, did not know the rationale with which the groups were formed. As mentioned earlier the program was advertised as “train your strengths” without giving hints on a putative impact on life satisfaction or even presenting findings related to indicators of well-being. The only precaution in the assignment of the groups was to ask each participant at the time of registration whether s/he knows someone who also registered for the program. In order to avoid the exchange of experiences or materials between the EG and the CG1, we ensured that those were assigned to the same group (this was the case for about a third of the participants in each of the groups). Training sessions were held at 7:00 p.m. to guarantee that the starting time did not interfere with regular working hours.

In compiling the program, care was taken that the intensity and the way the interventions had to be completed were comparable between the two groups (e.g., a balanced number of writing activities, outdoor activities etc.). Both groups underwent five interventions. The plan was that they spend an equal amount of time on conducting the tasks of the interventions and on doing similar activities but with a focus on different strengths.

The experimental group (EG, strengths highly related to life satisfaction) was assigned to interventions relating to *curiosity* (conducting four activities that were new to the person and that address exploration and absorption and describing those in a short report), *gratitude* (writing a gratitude letter as in Seligman et al. 2005), *hope* (conducting the “One door closes, one door opens”-activity; e.g., Peterson 2006), *humor* (activities from the eight-step humor training program by McGhee 2010), and *zest* (adding activities from the areas of

physical activity/sport, social contact, and challenging tasks/work to the daily routine, completing a schedule and describing the “extra”-activities).

The first control group (CG1, addressing strengths with low correlations with SWL) underwent interventions on *appreciation of beauty and excellence* (intervention by Diessner et al. 2006), *creativity* (completion of tasks for practicing creativity—e.g., sentence completion or variations of tasks from the *Torrance Test of Creative Thinking*; Torrance 1974), *kindness* (counting kindness intervention by Otake et al. 2006), *love of learning* (task of learning with different materials in written, acoustic, visual forms; writing about the process and emotions felt when acquiring new knowledge), and *open-mindedness* (dealing with topics of daily life, thinking about the pros and cons of various topics, and writing them down; also to write about new insights they got and emotions felt). The second control group (CG2) was a waiting group of persons who registered for the program and who were informed that they would start at a later stage. They completed the same questionnaires (except for those that evaluated the program) at the same time as participants from the EG and CG1. Participants completed the SWLS and the VIA-IS about 2–4 weeks before the intervention started and again about 2–4 weeks after completion of the program (posttest).

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Participants completed the SWLS and the VIA-IS about two to four weeks before the intervention started and again about 2–4 weeks after completion of the program (posttest). The participants neither paid for taking part in the program (all materials were given to them for free) nor were they paid for joining the Z.S.P. They received a feedback on their individual results after completion of the *full* program.

3 Results

3.1 Analysis of Pretest Data

For an analysis of differences in the pretest, an ANOVA was computed with satisfaction with life (SWLS) as dependent variable and the three groups (the two groups with interventions [EG, CG1] and the control group [CG2]) as grouping variable. As expected, due to the random assignment there was a nonsignificant main effect; $F(2, 177) = 0.92$, $p = .40$. All other comparisons also were not statistically significant (all $p > .05$); neither *males* vs. *females* nor *younger* vs. *older* participants (mean split) differed in their satisfaction with life. Therefore, neither age nor gender was considered in the subsequently conducted analyses.

3.2 Analysis of Drop-out Rate

Not all participants completed the full program. At the second measurement time, data were available from 39 participants in the EG, 44 in CG1, and 53 in the CG2. Thus, about 70 % of the participants in the groups that underwent interventions and close to 90 % in the CG2 completed the second assignment. A few characteristics of those dropping out should be highlighted. There were no mean-level differences in life satisfaction ($t(176) = 1.23$, $p = .22$) but in the VIA-IS those dropping out were less persistent ($M = 3.40$, $SD = 0.54$ vs. $M = 3.13$, $SD = 0.57$; $t(175) = 2.85$, $p = .005$; $d = 0.49$) and less self-regulated ($M = 3.28$, $SD = 0.57$ vs. $M = 3.00$, $SD = 0.64$; $t(175) = 2.69$, $p = .008$; $d = 0.46$). There was no difference in any other VIA-strength. Additionally, those who quit earlier were younger than the ones who completed the full program ($M = 43.09$, $SD = 13.52$ vs. $M = 35.41$, $SD = 9.68$; $t(165) = 3.36$, $p = .001$; $d = 0.65$).

3.3 Effectiveness of the Z.S.P. Interventions: Group Comparisons

For testing the impact of the treatment, we conducted an Analysis of Covariance (ANCOVA) with the SWLS-scores of the posttest as dependent variable and those at the

Table 1 Mean scores and standard deviations in satisfaction with life in the experimental group ($n = 39$), CG1 ($n = 44$), and CG2 ($n = 53$) before and after the intervention

SWLS = mean (M) and standard deviation (SD) for the satisfaction with life scale

SWLS	EG1	CG1	CG2
Pretest (t_1)			
M	4.35	4.92	4.49
SD	1.07	0.96	1.09
Posttest (t_2)			
M	4.79	4.88	4.49
SD	1.15	1.05	0.98

pretest as covariate. Table 1 contains means and standard deviations of the pre- and posttest in the three groups.

Only participants in the EG reported an increase in satisfaction with life; when conducting t tests for dependent samples, only in this group, the pre-post differences were significant ($t[38] = -3.59$, $p < .01$; $d = 1.16$). When inspecting Table 1, it should be mentioned that despite that there were no mean level differences in the previously reported analyses in the pretest, participants in the CG1 reported a numerically higher life satisfaction, which was more or less stable before and after the intervention. Table 2 provides the ANCOVA-statistics.

The covariate, satisfaction with life at the pretest, was significantly related to the satisfaction with life after completion of the program. There was a significant effect of the intervention on satisfaction with life after controlling for the effect of the pretest satisfaction. Planned contrasts revealed that the program applied to the experimental group increased satisfaction with life ($p = .01$) compared with the CG2, while the interventions in CG1 did not ($p = .71$). Thus, there was an increase in life satisfaction in the experimental group, which exceeded a control condition (waiting group). This comparison, however, was hindered by the described numeric differences at the baseline level.

3.4 Determinants of Success in the Interventions: The Role of Character Strengths

The following analyses focused on character strengths as determinants of success in the interventions, which was defined as an increase in life satisfaction in the comparison of the SWLS-score before and after the program (posttest minus pretest). The relationship between the pretest level of the strengths in the VIA-IS and change scores in the SWLS were analyzed, as were changes in the difference scores on the character strengths (posttest minus pretest strengths) in relation to the change scores on the SWLS. A first hint of putative effects stems from an analysis where a difference score in the trained strengths was considered as an additional covariate to the previously reported ANCOVA. There, changes in the strengths approached significance with the posttest life satisfaction and had a medium effect size ($F[1, 128] = 3.09$, $p = .08$, $\eta^2 = 0.08$). Thus, there seemed to be some impact of the changes in the character strengths, which required a more detailed analysis. Therefore, analyses were conducted that also included strengths that were not *directly* targeted by the interventions. The difference score in satisfaction with life was correlated with the VIA-IS scales (split for the total sample—baseline and after the intervention—and the two groups that underwent interventions) and, additionally, correlations with a difference score in the strengths were computed (in a total score for the EG and CG1 and split by the groups; see Table 3).

Table 2 Analysis of covariance of posttest satisfaction with life as a function of intervention group, with pretest satisfaction with life scores as covariate

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	η^2
Covariate	1	79.17	79.17	151.58***	0.54
IG	2	3.90	1.95	3.73*	0.05
Error	132	68.94			
Total	136	31,637.76			

IG intervention group

* $p < .05$; *** $p < .001$

Table 3 shows that the data replicated earlier findings on the character strengths and satisfaction with life—relation very well (data from the pre-test). In this sample, the strengths numerically most related to life satisfaction were hope, zest, curiosity, love, and gratitude with humor ranking at the tenth position. On the lower end were modesty, appreciation of beauty and excellence, love of learning, open-mindedness, and forgiveness; kindness followed next, and creativity was at the 9th lowest position.

For the EG, in most of the cases, a *lower* expression of the strengths was related to *enhancements* in satisfaction with life. Thus, it seems as if practicing strengths that were lower at the beginning of the program promoted well-being more strongly. This was particularly evident for *curiosity* for which the highest correlation coefficient was found for any of the five strengths trained in the EG ($r^2 = 0.10$). However, this relation was less clear for CG1, where mostly, only low negative relations were found. Additionally, the trainings seemed to have an impact on strengths that were not directly targeted by an intervention. For example, low *love of learning* was associated with higher gains in well-being in the EG; and lower (but positive gains) in CG1 where it was explicitly trained. The presence of other strengths facilitated enhancement of life-satisfaction. For example, higher expressions in persistence, honesty, and modesty on the VIA-IS were associated with greater SWLS difference scores. The latter was of particular interest as modesty is typically among the lowest (or even negatively) correlated strengths with satisfaction with life. The only character strength with a significant positive correlation with gain in SWL, in the EG, was teamwork.

A few further findings on strengths as potential determinants of success in the interventions should be highlighted. For example, *self-regulation* seemed to play a key role as it yielded significantly positive correlation coefficients in the EG and CG1—between 18.5 and 25 % of the variance in gain of self-regulation were shared with gain in life satisfaction. The single highest coefficient was found for hope ($r^2 = 0.36$)—but paradoxically in CG1, while the coefficient was numerically lower in the EG (where it was trained). In the latter group, a gain in *zest* was strongly related to success in the program. Out of those strengths trained in CG1, open-mindedness, appreciation of beauty and excellence were robustly related to an increase in satisfaction with life. Moreover, increases in bravery, persistence, honesty, and prudence correlated with higher satisfaction with life after completion of the program.

Other factors that might have contributed to success in the program were also considered. For example, neither the number of interventions that participants fully completed ($r(38) = 0.04$ and $r(45) = 0.03$ for the EG and CG1, respectively) nor the number of interventions from which they subjectively felt to have a benefit due to the specific training

Table 3 Pearson correlations between the VIA-IS and success in the Z.S.P

VIA-IS	VIA-IS raw scores				VIA-IS difference scores		
	Pre-test	EG + CG1	EG	CG1	EG1 + CG1	EG	CG1
Creativity (EG2)	0.18*	−0.05	−0.01	−0.08	−0.05	−0.10	0.03
Curiosity (EG1)	0.42**	−0.23*	−0.32*	−0.13	0.28*	0.22	0.26
Open (EG2)	0.14	−0.11	−0.22	0.01	0.28*	0.23	0.39**
Learning (EG2)	0.10	−0.10	−0.35*	0.14	0.13	0.11	0.14
Perspective	0.32**	−0.07	−0.14	0.07	0.28*	0.22	0.26
Bravery	0.30**	−0.14	−0.21	−0.11	0.30**	0.26	0.33**
Persistence	0.27**	0.18	−0.02	0.38*	0.24*	0.14	0.40**
Honesty	0.20**	0.21	0.11	0.33*	0.22	0.09	0.37**
Zest (EG1)	0.48**	0.01	−0.12	0.19	0.34**	0.45**	0.26
Love	0.39**	0.04	0.01	0.07	0.17	0.25	0.09
Kindness (EG2)	0.16*	0.08	−0.09	0.18	0.14	0.17	0.27
Social Intelligence	0.29**	−0.12	−0.32*	0.03	0.24*	0.25	0.24
Teamwork	0.24**	0.18	0.38*	0.10	0.15	0.01	0.33*
Fairness	0.16*	0.12	0.11	0.17	0.18	0.21	0.22
Leadership	0.18*	0.18	0.13	0.25	0.14	0.20	0.27
Forgiveness	0.15*	0.10	0.15	0.07	0.00	−0.04	0.06
Modesty	0.04	0.22*	0.12	0.32*	−0.06	−0.07	−0.01
Prudence	0.17*	0.15	0.01	0.20	0.20	0.19	0.38*
Self-regulation	0.24**	−0.10	−0.32*	0.04	0.40**	0.50**	0.43**
Beauty (EG2)	0.06	−0.16	−0.29	−0.10	0.29**	0.14	0.47**
Gratitude (EG1)	0.34**	−0.06	−0.16	0.13	0.25*	0.22	0.21
Hope (EG1)	0.51**	−0.02	−0.11	0.09	0.43**	0.28	0.60**
Humor (EG1)	0.25**	−0.03	−0.08	0.02	0.17	0.11	0.23
Religiosity	0.22**	0.03	−0.07	0.06	0.16	0.27	0.08

Pearson correlations between the VIA-IS and success in the Z.S.P and a difference score in strengths and success in the program

Total = total score for EG1 ($n = 39$) and EG2 ($n = 44$). Pre-test is correlation between VIA-IS and SWLS at t_1 (pre-test = all participants combined; i.e., EG1, EG2, and CG; $N = 177$). VIA-IS difference scores = VIA scores (pretest) subtracted from posttest VIA scores, which are then correlated in the difference scores from the SWLS. Parenthetics in the VIA-IS-column indicate which strengths were trained in which intervention. Open = open-mindedness; Learning = Love of learning; Beauty = Appreciation of beauty and excellence

* $p < .05$, ** $p < .01$

($r(38) = 0.07$ and $r(45) = 0.11$; all *n.s.*) were related in a meaningful way to the success in the program.

3.5 Perceived Changes in Cheerfulness, Happiness, Positive Mood, and Life Satisfaction After Completion of the Z.S.P

Participants provided evaluations on how they felt after completion of the program compared to their life prior to the program. Table 4 displays mean scores and standard deviations for the respective ratings in the three groups.

Table 4 Mean level differences in self-evaluations of changes through the intervention

Variables	EG	CG1	CG2	<i>F</i>	<i>p</i>
<i>EG1</i>					
Curiosity	4.87 (0.81) ^a	4.58 (0.85) ^b	4.21 (0.72) ^{ab}	7.76	<.001
Gratitude	5.39 (0.82) ^{ab}	4.91 (0.87) ^{ac}	4.21 (0.85) ^{bc}	22.17	<.0001
Hope	4.79 (0.84) ^a	4.51 (0.96)	4.17 (0.90) ^a	5.20	<.01
Humor	4.71 (0.90) ^a	4.44 (0.73)	4.19 (0.66) ^a	5.17	<.01
Zest	5.00 (0.84) ^{ab}	4.53 (0.98) ^{ac}	4.04 (0.93) ^{bc}	13.82	<.0001
<i>EG2</i>					
Beauty	4.47 (0.83) ^{ab}	4.95 (0.79) ^{ac}	4.10 (0.63) ^{bc}	15.64	<.0001
Creativity	4.45 (0.72)	4.60 (0.88)	4.29 (0.75)	1.91	=.15
Kindness	4.55 (0.65) ^a	4.79 (0.80) ^b	4.12 (0.65) ^{ab}	11.41	<.0001
Learning	4.74 (0.72) ^a	4.60 (0.79) ^b	4.21 (0.61) ^{ab}	6.99	<.01
Open	4.39 (0.83)	4.51 (0.74)	4.25 (0.56)	1.67	=.19
<i>Well-being</i>					
Cheerfulness	4.82 (0.83) ^a	4.56 (0.91) ^b	4.17 (0.88) ^{ab}	6.16	<.01
Happiness	4.95 (0.84) ^a	4.74 (0.85) ^b	4.08 (0.90) ^{ab}	12.80	<.0001
Positive mood	4.84 (0.86) ^a	4.58 (0.98) ^b	3.94 (0.90) ^{ab}	11.84	<.0001
Satisfaction	4.87 (0.88) ^a	4.60 (1.09) ^b	4.15 (1.04) ^{ab}	5.78	<.01

N = 133 (*df*₁ = 2, *df*₂ = 130). EG1 = experimental group (interventions on high correlated strengths), CG1 = interventions on low correlated strengths, CG2 = waiting group; Beauty = Appreciation of beauty and excellence, Open = open-mindedness; Learning = Love of learning, Satisfaction = satisfaction with life

Numbers in parentheses are standard deviations

^{abc} Means sharing a superscript differ significantly (*p* < .01)

Table 4 shows that there were only *positive* deviations in the groups that underwent interventions from the score that indicated no change (= 4). As expected, the median of all deviations from score 4 was highest (i.e., highest enhancement) in the EG (median = 0.81; lowest = 0.39, highest = 1.39), followed by CG1 (median = 0.59; lowest = 0.44, highest = 0.95), and CG2 that reported a slight enhancement compared to the baseline in the median (= 0.17; lowest = −0.06, highest = 0.29). The latter might have been an effect of signing into the program (especially as in this case, the control group was a waiting group that knew that they would undergo an intervention at a later stage). All means in the EG and CG1 differed significantly from the score 4 (one-sample *t* test; *p* < .01). In the CG2, all deviations ≥ 0.19 differed significantly from the constant at *p* < .05. Thus, there were (minor) perceived gains in six out of ten strengths but no gains in the four well being evaluations.

When testing for mean-level differences (see Table 4), participants from the EG saw themselves as more grateful and more curious than participants in both CG1 and CG2; while those in CG1 (significantly) exceeded the EG's in their appreciation of beauty and excellence only. Except for creativity and open-mindedness, all training groups exceeded the waiting group (CG2) in their self-evaluation of their gains in strengths.

The numerically strongest enhancement in the non-strength related self-estimations was found for happiness in the EG; both groups that underwent interventions exceeded the waiting group. Additionally, the participants in *both* intervention groups saw themselves as more cheerful, with higher satisfaction with life, and with elevated positive mood in

comparison to the CG2. Thus, the interventions did have an impact on the self-evaluation of participants from CG1, too—despite that they did not report higher satisfaction with life when measured via the SWLS.

4 Discussion

The study shows that interventions targeted at those strengths from the VIA-classification, that are typically highly related with satisfaction with life, are potent for enhancing satisfaction with life (with the exception that we trained humor instead of love of the typically most correlated strengths). As expected, there was an increase in life satisfaction in a group that underwent interventions on curiosity, gratitude, hope, humor, and zest (medium effect sizes). This result provides initial experimental support for Park et al.'s (2004) suggestion of addressing primarily those strengths in interventions—given the design of the study, it should probably be rephrased to the rule of thumb that primarily interventions on the highly correlated strengths should be pursued. Following Seligman (2011), one might argue that living one's core strengths may facilitate the experience of positive emotions, engagement, meaning, positive relationships, and accomplishment. Thus, strengths seem to have potential for contributing to the psychological fulfillment of people (cf. Mitchell et al. 2009; Park et al. 2004; Peterson and Seligman 2004; Seligman et al. 2005). More work is needed for uncovering how exactly strengths contribute to the good life and under what conditions such effects can be observed. It is expected that there are general patterns for strength-based interventions (e.g., enabling positive emotions; fostering engagement; etc.) but that there are also strengths-specific processes and mechanisms (e.g., zest-interventions may induce higher physical activation and may facilitate physical well-being). However, strength-specific effects cannot be evaluated in the present study as all strengths were tested jointly.

Results were mixed regarding the further research questions. Success in this program exceeded a waiting group without interventions but not a control group that underwent interventions on strengths that typically correlate low with life satisfaction. Also, this control group did not increase in life satisfaction. Thus, this initial study provides support for the notion of the special role of the character strengths highly correlated with SWL but does not support the idea that the training of *any* strength leads to an increase in life satisfaction. However, the interpretation of the findings is somewhat hindered by the fact that—despite the random assignment of the participants—participants in the control group that also underwent interventions yielded comparatively higher (yet not statistically different) baseline scores in life satisfaction that were also stable after completion of the program. There is no explanation in this data on why such differences might have occurred (as all participants were randomly assigned) and replication studies will be needed for excluding that the effects in the EG may be due to a regression to the mean.

Results were clearer when life satisfaction, as measured by the SWLS, was not the criterion for success in the program but rather, when participants were asked to report the experienced changes due to the program. Participants had the impression of having benefited from participating in the Z.S.P. irrespective of their assignment to one of the groups that underwent interventions. In comparison with the wait-listed control group, both of these groups yielded higher subjectively experienced cheerfulness, happiness, positive mood and life satisfaction (as measured by a single rating, rather than by the SWLS). These effects were larger than could be explained due to effects that might be associated with being part of a training program or with the satisfaction resulting from simply signing up

for such a program (i.e., being in the wait-listed group). Therefore, participants had a subjective gain from enrolling to the program. The highest gain at the level of the strengths was found for gratitude, where participants exceeded the score indicating no change of more than one and a half standard deviations. Thus, working on strengths seems to be beneficial for people (in their own experience)—this holds also true for CG1 where the SWLS score did not change.

Furthermore, the study provides insights on the interplay of baseline expressions of specific strengths and success in the interventions. Here, self-regulation seems to play a key role. Peterson and Seligman (2004) define self-regulation (self-control) as “regulating what one feels and does; being disciplined; controlling one’s appetites and emotions” (p. 30). Despite self-regulation not being targeted directly, it seems as if this may have been trained through the structure of the program (i.e., regularly meetings, “home-work”, structured activities, filling in scales and evaluation forms regularly, etc.). Participants were given the chance to actively engage, to learn more about themselves, and to work on a goal that seemed to be of relevance to them (by signing up to the program). This blends well into research on self-regulation (see Carver and Scheier 1981). The activation of inner motivation and perceived control could be an important working mechanism of the tested interventions. Unfortunately, this cannot be controlled for empirically with the available data. However, it is self-evident that some of the techniques used in the Z.S.P. facilitate self-awareness and encourage the participants to actively monitor themselves. Other authors have also favored self-regulation as one of the working mechanisms for positive interventions (e.g., Sheldon and Lyubomirsky 2006). Overall, one might argue that interventions that (directly or indirectly) address the self-regulation of a person have a great potential for improving their SWL.

When comparing change scores in the character strengths, it was found that participants gained more SWL from the program when they had *lower* expressions of the targeted character strengths at the pretest. Thus, trainings that targeted relatively weaker character strengths or strengths that were not congruent with the person’s profile (not in their top five strengths) seemed to have a stronger impact than the training of individually higher expressed strengths. These results need to be discussed with respect to findings by Seligman et al. (2005) and Mitchell et al. (2009), who report that the training of one’s signature strengths are effective in enhancing life satisfaction and alleviating depression. This may be a first hint that the training of individual strengths but also training of individually lower expressed strengths may be helpful in increasing SWL. There may also be effects of the single interventions. For example, the curiosity intervention may be more efficient and have greater appeal for those low in curiosity as it addresses rather basic curious behavior instead of potentially higher forms of curiosity that may entail an even deeper engagement with new topics. Thus, it is expected that there is an interplay between the intervention itself and the expression of the strengths that may have an impact on the outcome.

In the present study, positive effects were also found for strengths that were *not* trained in the Z.S.P. For example, lower baseline expressions in social intelligence, self-regulation, and appreciation of beauty and excellence but higher ones in teamwork contributed to success in the intervention in the EG. In the CG1, especially those higher in their base-line levels of persistency, honesty, and modesty, and potentially having these strengths as their signature-strengths, gained from the interventions. These findings cannot be fully explained with the present data but they allow for deriving hypotheses to follow up in future research. For example, CG1 trained three strengths that are derived from the virtue of wisdom and knowledge in Peterson and Seligman’s (2004) classification system,

whereas only one strength from wisdom and knowledge was trained in the EG. It might be that fostering these strengths demands higher levels of persistence and that these strengths are more congruent in modest and honest people.

As a limitation of the study, it needs to be acknowledged that the design does not allow for the evaluation of a *single* intervention but only a group of five strengths together. It might be that the effects of interventions on some of those strengths that were grouped together for this study did not fit well together or might have even hindered positive effects. For example, if the intensity of conducting five different interventions within the given time span was too high and that some effects would have asked for a longer training time for one particular strength. However, this would have to be tested empirically. Also, it needs to be mentioned that the SWLS had to be completed 2–4 weeks after the intervention. It can only be speculated whether results would have been more profound immediately after the intervention, or perhaps differences between groups were affected by the length after invention by which the individual completed the measure. Nevertheless, it was interesting to see that people with lower expressions at the beginning of the program yielded higher enhancements in satisfaction with life.

As a further limitation the 30 % drop-out rate in the groups that underwent strengths-based interventions needs mentioning. Although it could be interpreted as evidence for the validity of the VIA-IS that those who did not finish the program yielded lower scores in *persistence* and *self-regulation* in their baseline scores compared to those who completed the full program, this number needs further consideration. Those dropping out earlier were younger than those who stayed on. It might be that the presentations and the interventions were better tailored to the older participants or that the required self-regulatory processes work better with higher age. On a related note, Sin and Lyubomirsky (2009) found that the benefits of positive psychology interventions increased with age. Thus, one of the aims for future studies could be to tailor the interventions better to the needs of younger people. More generally speaking, the person-intervention fit should be investigated more thoroughly. It would then be interesting to test whether those people dropping out earlier would show different characteristics from those in the present sample. Additionally, it needs to be mentioned that we aimed for paralleling the interventions, which the two groups (EG and CG1) underwent, in terms of amount of the time needed for its completion or the kind of activity (e.g., writing activity, outdoor activity, etc.). Despite the standardization and pre-tests, it cannot be fully ruled out that the participants completed them differently. Thus, replications with further unification of the interventions are needed. Of course, it should also be mentioned that the interventions themselves and the materials used could be further improved, which is an aim for upcoming studies (e.g., improving the instructions, the presentations, etc.). A further limitation is the self-evaluation sheet. Information is there given on the basis of single items. Although the items have face-validity, the validity of the instrument can be questioned as it, for example, cannot be excluded that the affective state, or the life situation at the time of responding may have had an impact on the answering behavior of the participants. Therefore, findings that are based on this instrument are of rather tentative nature.

Additionally, it needs to be acknowledged that, in this first study on experimental manipulations of the VIA character strengths, we did not adjust the alpha-level for multiple comparisons when running multiple tests. Thus, replications and testing of specific hypotheses derived from the present studies are needed for testing on whether some of the effects reported here may be due to an inflation of the alpha-level. Overall, one might conclude that further studies are warranted with regard to tailoring specific interventions to

specific people (Proctor et al. 2011) but also when translating strength-based interventions to practice (Biswas-Diener et al. 2011; Magyar-Moe 2009).

The Zurich Strengths Program (Z.S.P.) demonstrated being a promising start for the development of further strengths-based interventions that may help improving life satisfaction. An extensive strength training protocol has been developed that enables further studying strength-based interventions in a standardized way. The program was well received by the participants. Based on these experiences, further studies are being planned with variations in the strength-based interventions and populations to be trained. Additionally, further interest lies in uncovering underlying mechanisms and circumstances that enable positive changes. In this study, we focused on the cognitive component of subjective well-being only, but, of course, well-being has many different facets that may be addressed also. Strength-based interventions may have an impact beyond the cognitive aspects of well-being. For example, humor-based interventions may also have a strong affective component or writing a gratitude letter can be useful in fostering positive relationships, which may reflect on different aspects of psychological and subjective well-being. Thus, a multi-faceted measurement of the outcome of strength-based interventions will help for a better understanding of these interventions. In any case, the results point towards a potential in strength-based interventions for contributing positively to the well-being of people.

Acknowledgments Data collection was supported by a research grant from the University of Zurich (FK 56231101) and the Suzanne and Hans Biäsch Foundation for Applied Psychology. The authors are grateful to Fabian Gander, Peter Hilpert-Anand, Serra Koyuncu, Iwana Städeli, Maria Ture, and Tobias Wyss who helped conducting the study. A special thanks goes to Sandra Rusch, Heidi Stolz, and Reto Zeller for their assistance in the trainings for humor and creativity, respectively.

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