# The Role of Specific Positive Emotions in enhancing Flourishing: A randomized controlled trial

Master thesis

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**Abstract**

A lot of research revealed positive outcomes on resilience and well-being of enhancing positive emotions based on the Broaden- and Build Theory. Yet, little is known about the role of specific positive emotions in enhancing flourishing. This study examined the efficacy of nine positive emotions on enhancing flourishing utilizing a six-week gratitude intervention. 169 participants (89.9% female; *Mean age* = 48.67; *SD* = 9.42) were randomly assigned to the gratitude intervention or a waitlist control condition. A Chi-square test showed that the gratitude intervention led to significantly more flourishers compared to the waitlist control group at post-test ($\chi^2$ (1) = 6.149, $p$ = 0.013). Results of ANCOVA's showed that participants in the intervention condition experienced the specific positive emotions to a significantly greater extent at post-test compared to waitlist, except for feeling calm, for which a marginally significant effect was found. Multiple mediation analyses revealed that only increased levels of feeling grateful during the intervention were a significant mediator in the relationship between the gratitude intervention and flourishing at post-test, indicating that people in the gratitude intervention who felt more grateful during the intervention, were found to flourish at post-test compared to waitlist. It is recommended that future research in the field of PPI's tries to recruit more heterogeneous samples regarding educational level and gender to increase generalizability of findings. This study implicates the beneficial effects of gratitude interventions on specific positive emotions as well as on flourishing, indicating that practicing gratitude is not only beneficial for feeling well, but also for leading a meaningful life. The 6-week gratitude intervention might be a promising self-help intervention, in order to promote flourishing mental health and to prevent mental diseases in turn.

*Keywords:* Positive emotions, Flourishing, Gratitude intervention, Positive psychological interventions

# Introduction

## Flourishing

The concept of flourishing has received increased attention due to the emergence of positive psychology. People are assumed to flourish if they possess high levels of both hedonic and eudaimonic well-being (Keyes, 2005). The former represents emotional or subjective well-being, whereas the latter is composed of social well-being and psychological well-being. Subjective well-being refers to individuals' thoughts and feelings about his or her life (Diener, 1984). Social well-being is concerned with the individual as part of a bigger society and the optimal functioning within this society (Keyes, 1998). Ryff and Keyes (1995) describe psychological well-being as a multidimensional construct encompassing that individuals function well by realizing one's potential in order to cope with the challenges in life. In the past, happiness or life-satisfaction as a single construct (hedonic well-being) were often used as outcome measures in research (Shiota et al., 2017). However, it has been shown that happiness is not a unidimensional construct and that living a meaningful life is essential for individuals, next to feeling happy (Keyes, Shmotkin, & Ryff, 2002; Diener & Seligman, 2004).

Schotanus-Dijkstra and colleagues (2016) examined the factors associated with flourishing in a representative sample of the Dutch population and found that flourishers are characterized by the personality traits consciousness and extraversion. Further factors of individuals who flourish were younger and higher educated, received more social support, and experienced more positive life-events (Schotanus-Dijkstra, Pieterse et al., 2016; Keyes, 2007). The same study also showed that 36.5% of the respondents could be categorized as flourishing. Thus, there seems to be room for improvement regarding flourishing in the Dutch population.

This is especially important since flourishing is beneficial for an individual and socioeconomic level. On an individual level, it has been shown that flourishing protects against the onset of mood and anxiety disorders (Schotanus-Dijkstra, ten Have, Lamers, de Graaf, & Bohlmeijer, 2016) and results in less risk for cardiovascular and chronic physical diseases and higher resilience (Keyes, 2007). On a socioeconomic level, it has been examined that people who flourish have fewer missed working days and less need for healthcare (Keyes, 2005, 2007). It is therefore fundamental to further identify predictive factors of flourishing.

Several factors that lead to flourishing have already been identified. Schotanus-Dijkstra and colleagues (2016) found in their longitudinal cross-sectional study that social

support and positive live-events significantly contribute to flourishing. Also, having satisfying relationships has been found to be a predictor of flourishing (Coffey, Warren, & Gottfried, 2015; Sanning & Nabors, 2015). Most importantly, positive emotions seem to be a key indicator of flourishing (Coffey at al., 2015; Fredrickson, 2001). Fredrickson (2001) underscores that positive emotions are not only an indicator of flourishing but produce it in the short- and long-term.

**Positive emotions**

In general, it has been found that positive emotions have many positive outcomes. Previous studies have shown that positive emotions encourage approach-oriented behavior (Taylor et al., 2017), are associated with resilience (Fredrickson & Kurtz, 2011) and increase social connectedness (Garland et al., 2010). Empirical evidence also indicates that experiencing positive emotions leads to a more global attentional focus as well as creative thinking (e.g., Fredrickson & Branigan, 2005). Further, it has been found that positive emotions are associated with subclinical depression (Benning & Oumeziane, 2016), buffer against stress (Garland et al., 2010) and the effects of negative emotions (Garland et al., 2010; Fredrickson, 2001).

More recently, the need to discriminate between the function of specific positive emotions rather than focusing on positive emotions in general has been identified (Gruber et al., 2017; Shiota et al., 2017; Vazquez, 2017). Positive emotions differ, for example, regarding their valuable functions and effects on cognition and judgment (Shiota et al., 2017). By introducing the Broaden- and Build Theory, Fredrickson (1998) made a first step for understanding different characteristics of specific positive emotions. The theory assumes that positive emotions broaden individuals' thought-action repertoire and build enduring personal resources over time (Fredrickson, 1998; Fredrickson, 2013; Garland et al., 2010). By experiencing positive emotions, people's awareness is broadened, which leads to a greater variety of cognition and possible actions they can choose from. Over time, this broadened thought-action repertoire leads to the effect of building enduring social, intellectual and physical resources (Fredrickson, 1998).

Fredrickson points out that different positive emotions lead to diverse thought-action repertoires. It is, for example, described that joy broadens a person's thought-action repertoire by the urge to play, which in the long-term leads to building physical, intellectual and social resources (Fredrickson, 1998). Interest causes individuals to explore their environment broadly and build intellectual resources. Serenity leads individuals to broaden their world views. Love, which is composed of several positive emotions, builds personal resources

which in turn provide someone with social support (Fredrickson, 1998). By causing the urge to be playful and social, amusement results in a broadened ability to perceive and think (Fredrickson & Branigan, 2005). Inspiration makes individuals doing the best they can in order to reach their goals (Fredrickson, 2010). Later, Fredrickson included gratitude in her studies and explained that gratitude makes people behave prosocial. It is assumed that gratitude causes many positive outcomes and that it is the main contributor to happiness (Watkins, McLaughlin, & Parker, 2018).

However, next to these beneficial effects it has also been stated that not all of the above described specific positive emotions have merely desirable positive outcomes (Vazquez, 2017). Fredrickson herself points out that inspiration can transform into feeling envy which makes a person discouraged and Gall-Myrick (2017) underscores that inspiration is often felt in fear-inducing situations. While awe can make you feel part of something bigger, like the community, it can switch over to fear (Fredrickson, 2010). Besides, Miller (2017) explains that awe is related to masochism. Likewise, Gruber et al. (2017) found that higher levels of joy are associated with more symptoms of mania in an adolescent sample.

The latter finding is especially interesting since Watkins, Emmons, Greaves, and Bell (2017) report that joy is strongly correlated with well-being. Watkins et al. (2017) describe joy as a discrete positive emotion that is felt if we experience an event or situation we have long hoped for and that we value as good. Also feeling grateful has been found to be an important predictor of well-being (Watkins et al., 2018; Nezlek, Newman, & Thrash, 2017; Wood, Joseph, & Maltby, 2009). Gratitude is assumed to improve well-being by generating a more positive outlook and positive appraisal of life (Emmons & Mishra, 2011). Thus, specific positive emotions have been found to be included in psychopathology (Gall-Myrick, 2017; Gruber et al., 2017) as well as to have beneficial effects such as increasing resilience and well-being (Fredrickson, 2001).

While the feelings of joy and gratitude have been investigated in connection to well-being, the role of other specific positive emotions in enhancing well-being has not been studied. Although Fredrickson (1998, 2010) discriminates between the role of several positive emotions which lead to increased well-being in the long term, this discrimination concentrates on their commonality, namely broadening and building individuals' thought-action repertoire, which covers not the full picture of positive emotions' beneficial effects. In addition to that, if specific positive emotions were included in studies their relationship was investigated regarding different forms of well-being (eudaimonic or hedonic) (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009; Seaton & Beaumont, 2015; Fredrickson & Joiner, 2002). However,

little is known which specific positive emotions lead to flourishing defined as possessing high levels of both hedonic and eudaimonic well-being.

**Positive psychological interventions**

Identifying factors that lead to and enhance human flourishing is one of the main aims of positive psychology which is defined as the study of positive human functioning, strengths, and virtue (Seligman & Csikszentmihayi, 2000; Sheldon & King, 2001). One way how to enhance flourishing as well as positive emotions is by means of Positive Psychological Interventions (PPI's) (Schotanus-Dijkstra et al., 2017; Pintado, Castillo, & Penagos-Corzo, 2018). Sin and Lyubomirsky (2009) define PPI's as: "Treatment methods or intentional activities that aim to cultivate positive feelings, behaviors, or cognitions" (p.468). According to Bolier et al. (2013) PPI's also need to be based on the theoretical background of positive psychology. The effectiveness of PPI's for improving well-being has been shown in several meta-analyses (e.g. Bolier et al., 2013). Examples of traditional PPI's are doing acts of kindness or expressing gratitude.

Gratitude interventions are a promising way to enhance human flourishing. Common forms of gratitude interventions are counting one's blessings in the form of a diary or formulating a thank-you letter. Therefore, gratitude interventions or exercises are characterized by little effort, like costs or time (Dickens, 2017). As such, gratitude exercises can be easily incorporated into self-help interventions. Watkins et al. (2018) describe that one possible way how gratitude interventions enhance well-being is by training cognitive processes in a way, that a positive interpretation bias is enhanced. Another explanation is that by the expression of gratitude, the social relationships are strengthened.

Although several studies underscored the beneficial effects of gratitude interventions on well-being and life-satisfaction (Berger, Bachner-Melman, & Lev-Ari, 2019; Emmons & Mishra, 2011), other studies challenged the effectiveness of gratitude interventions (e.g. Davis et al., 2016). Dickens (2017) points out that gratitude interventions should not be overemphasized partly because effect sizes are only small to medium. While the positive effect of gratitude interventions on well-being has been contradictory, the effect on flourishing defined as possessing high levels of both hedonic and eudaimonic well-being has been neglected. Baumsteiger, Mangan, Cotton-Bronk, and Bono (2018) theorized that gratitude is a possible manner in enhancing human flourishing, although flourishing was not included as an outcome measure in that study.

Previous studies also reported positive effects of gratitude interventions on positive emotions. Ouweneel, LeBlanc, & Schaufeli (2013) found for example that a gratitude

intervention led to an increase of experiencing positive emotions on a daily basis among university students. A study by Lambert, Fincham, & Stillman (2012) revealed that keeping a four-week gratitude journal led to a marginal increase of positive emotions. While Lambert et al. (2012) propose that increased feelings of gratitude lead to the experience of other positive emotions, no study examined which specific positive emotions are enhanced by gratitude interventions.

**The present study**

Based on prior studies it becomes apparent that a detailed understanding of the function of specific positive emotions is missing. Although evidence shows that positive emotions, especially gratitude and joy, lead to improved hedonic or eudaimonic well-being, it is yet unknown which specific positive emotions lead to an improvement of both, i.e. flourishing. To fill this research gap, the present study will examine the role of several positive emotions independently. The purpose of this study is therefore to explore the role of nine specific positive emotions (feeling interested, moved, warm-hearted, joyful, satisfied, surprised, loving, calm and grateful mood) on promoting flourishing through a gratitude intervention. It is expected (1) that a 6-week gratitude intervention leads to significantly more flourishers and is significantly more effective in enhancing these nine specific positive emotions compared to a waitlist control group, (2) that increased levels of all nine positive emotions during the intervention mediate the relationship between the intervention condition and more flourishers at post-test, and (3) that increased levels of grateful mood and joy during the intervention are strongest associated with more flourishers at post-test in the gratitude intervention compared to waitlist control.

## Method

**Study design**

The present study is part of a five-armed randomized controlled trial (RCT) with the aim to improve mental well-being via different PPI's. For the current study, two of the five conditions were studied, namely the experimental condition (gratitude exercise) versus the waitlist control group (WL). Data were obtained at baseline (T0), after two weeks (T1) as well as four weeks (T2) during the intervention for the purpose of mediation effects, and at post-test six weeks after baseline (T3) (see Figure 1).

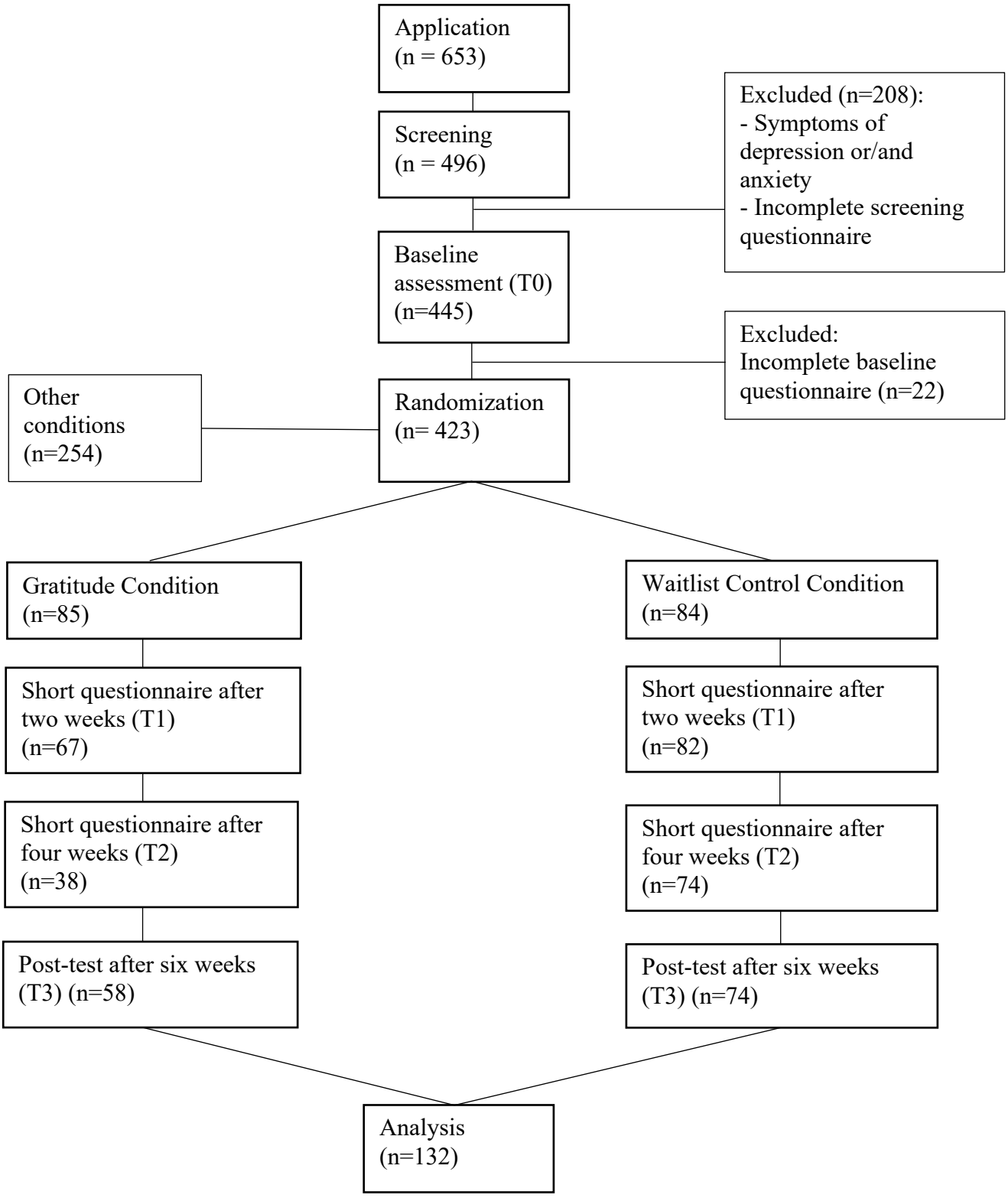


*Figure 1.* Flowchart of the study design with the number of participants.

**Procedure and Participants**

This study was approved by the Ethical Committee of the University of Twente and registered in The Netherlands Trial Register. To recruit participants, advertisements were

placed in regional as well as national newspapers, in an online newsletter of the "Psychology Magazine" and on Facebook. Potential participants had to register for the study via an online application. Then, participants had to provide informed consent before they could complete the screening questionnaire. This screening questionnaire was composed of demographic variables (gender, age, education), the level of current mental well-being, and the level of anxiety and depression. Participants were excluded if they were younger than 18 years, scored 34 or higher on the depression scale (CES-D) and/or had a score of 15 or higher on the anxiety scale (GAD-7). Participants who fulfilled all inclusion criteria could fill in the baseline questionnaires. Randomization took place by means of a stratified randomization procedure regarding gender, educational level and flourishers versus non-flourishers and was done via randomizer.org (https://www.randomizer.org).

In total 653 potential participants completed the online application. After screening, 208 individuals were excluded due to their CES-D scores, GAD-7 scores and/or incomplete screening questionnaire which resulted in 445 possible participants who received the baseline questionnaire. Of these 445 individuals did 22 not complete the questionnaires which resulted in a total sample size of 423 participants of whom 169 were divided over the two conditions (Figure 1).

**Conditions**

**6-week gratitude intervention.** Participants in this condition were asked to perform different gratitude exercises every week for six weeks. They also had to write an online happiness journal about their experiences with the exercise each Saturday. During the first week, participants had to execute for at least five days the "Three good things" exercise (Seligman, Ernst, Gillham, Reivich, & Linkins, 2009) for 15 minutes. The second week, participants were asked to imagine that things in their lives were not available anymore and to write down what they were grateful for. The third week, they had to express their gratitude towards a person who did something nice for them in a gratitude letter. Next, participants had to write for 15-30 minutes about a person, an event, or an aspect in their life they are grateful for. During the fifth week, the task was to write about difficult events for at least five evenings and to explore whether there are also positive consequences of it. The last week participants were asked to remind themselves every morning to live out of gratitude.

**Waitlist control condition.** The participants in this condition were told that they could choose a happiness exercise they preferred to do. Before doing so, they were told that normal fluctuations of their happiness level needed to be assessed first. It was stated that they would receive a self-chosen happiness exercise after the six weeks post-test survey.

**Measures**

**Flourishing.** The Dutch version of the Mental Health Continuum-Short Form (MHC-SF), which is composed of 14 items, was used to assess whether individuals were flourishing or not. The original scale was developed by Keyes (2005). The questionnaire consists of three subscales: emotional well-being (three items), social well-being (five items), and psychological well-being (six items). Respondents are asked to indicate how often they felt a specific feeling. An example is: "During the past month, how often did you feel happy?". Answers are given on a 6-point Likert Scale (*0 = never to 5 = every day*). If the person scored with "every day" or "almost every day" on one out of the three hedonic well-being items (e.g. happiness or interest in life) and on six out of the 11 eudaimonic well-being items (e.g. social contribution, social actualization, self-acceptance or autonomy) he or she was regarded as a flourisher (Keyes, 2007). The Dutch version of the MHC-SF shows good psychometric qualities (Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). The alpha score of the continuous measure in this study was $\alpha$ = .92.

**Positive emotions.** The Dutch version of the modified Differential Emotions Scale (mDES) by Schaefer, Nils, Sanchez, and Philippot (2010) was used to measure eight of the nine specific positive emotions. The mDES composes two sub-scales: positive emotions and negative emotions. Eight items measure positive emotions, each containing three words (e.g. 'Joyful, amused, happy' or 'Loving, affectionate, friendly'). Participants were asked to indicate to what extent they experience this group of feelings at the moment on a 7-point Likert Scale (*1 = not at all to 7 = very intense*). Previous studies reported good internal consistency of the scale (Trompetter, de Kleine, & Bohlmeijer, 2017). The item-scores ranged from 1 to 7, with higher scores indicating a higher level of the specific positive emotion. The reliability of the positive sub-scale in the current study was moderate with Cronbach's Alpha = .59.

**Grateful mood.** Grateful mood was measured separately with the help of four questions (McCullough, Tsang, & Emmons, 2004). Participants had to indicate how they felt the last 24 hours by means of a 7-point Likert Scale (*1 = strongly disagree to 7 = strongly agree*). Examples of the questions are: "I felt grateful" and "I was consciously aware that life is good for me". The total scores ranged from 5 to 28, with higher mean scores as an indication of a higher grateful mood. In this study, the reliability was $\alpha$= .83.

**Statistical analysis**

The statistical analyses were executed using SPSSv24 (IBM 2016). Descriptive statistics of participants' characteristics and Cronbach's Alpha coefficients for each scale

were calculated. Also, Skewness and Kurtosis with a cut-off score of +1 and -1 were determined. To test if differences at baseline between the two conditions and between drop-outs and completers exist, Chi-square independence tests and independent- samples t-tests were conducted. Participants with incomplete data on the MHC-SF at post-test were defined as drop-outs. To test the association between flourishing, the specific positive emotions, and grateful mood at baseline Pearson's correlations were calculated. It was assumed that *r*-values of 0.00 to 0.19 indicate a very weak, 0.20 to 0.39 a weak, 0.40 to 0.59 a moderate, 0.60 to 0.79 a strong, and 0.80 to 1.0 a very strong association (Evans, 1996).

Chi-square tests were computed to detect differences in the prevalence of flourishing between conditions (Gratitude intervention vs. WL) at post-test. Next, ANCOVA's were used to examine the effect of the gratitude intervention on the specific positive emotions and grateful mood after two weeks, four weeks, and at post-test, with the baseline outcomes entered as covariates. Cohen's *d* effect sizes for the between-group differences were calculated by using the following formula: $d = \frac{\bar{x}_1 - \bar{x}_2}{Sp}$. The pooled standard deviation (*Sp*) is calculated as follows: $Sp = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}}$. It was assumed that d = 0.2 indicates a small effect, d = 0.5 a medium effect, and d = 0.8 a large effect (Cohen, 1988).

Lastly, mediation analyses using the PROCESS macro version 3.3 for SPSS (Hayes, 2019) were conducted in order to examine whether the nine specific positive emotions function as mediators in the relationship between the gratitude intervention and flourishing and examine which specific positive emotions are strongest associated with flourishing. If the confidence interval of the indirect effect does not include zero, a statistically significant mediation can be assumed. Multiple mediation analysis was done, including the nine positive emotions simultaneously by using a 5.000 bootstrap confidence interval approach. In the present study X represents the condition (gratitude = 1 or waitlist = 0), Y is the number of flourishers at post-test and M represents the mediator measures feeling interested, moved, warm-hearted, joyful, satisfied, surprised, loving, calm and grateful. For the mediator measures a mean score of the two- and four-week questionnaires was calculated ($\frac{t1+t2)}{2}$), representing the degree to which individuals experienced the specific positive emotions during the intervention.

## Results

### Baseline characteristics

The socio-demographic characteristics of the sample at baseline are depicted in Table 1. Of the 169 participants were 152 female and 17 were male. The age ranged from 23 to 64

(*M* = 48.67; *SD* = 9.42). Most respondents were higher-educated females of Dutch nationality. Chi-square tests and independent-samples t-tests showed no significant differences between the two conditions regarding demographic characteristics at baseline (see Table 1). The baseline level of flourishing, the specific positive emotions, and grateful mood did also not significantly differ between groups (*ps* > 0.106).

Table 1

*Socio-demographic characteristics of the participants*

| | Intervention (n=85) | WL (n=84) | Total (n=169) | *p* |
|---|---|---|---|---|
| Age, *M* (SD) | 47.68 (9.5) | 49.67 (9.3) | 48.67 (9.42) | 0.172 |
| Gender, n (%) | | | | 0.778 |
| male | 8 (9.4) | 9 (10.7) | 17 (10.1) | |
| female | 77 (90.6) | 75 (89.3) | 152 (89.9) | |
| Educational level, n (%) | | | | 0.622 |
| low | 2 (2.4) | 4 (4.8) | 6 (3.6) | |
| middle | 17 (20.0) | 14 (16.7) | 31 (18.3) | |
| high | 66 (77.6) | 66 (78.6) | 132 (78.1) | |
| Marital status | | | | 0.750 |
| married | 46 (54.1) | 46 (54.8) | 92 (54.4) | |
| divorced | 16 (18.8) | 16 (19.0) | 32 (18.9) | |
| different | 23 (27.1) | 22 (26.2) | 45 (26.7) | |
| Living situation | | | | 0.319 |
| alone | 14 (16.5) | 21 (25.0) | 35 (20.7) | |
| not alone | 71 (83.5) | 63 (75.0) | 134 (79.3) | |
| Ethnicity, n (%) | | | | 0.436 |
| Dutch | 81 (95.3) | 81 (96.4) | 162 (95.9) | |
| different | 4 (4.7) | 3 (3.6) | 7 (4.2) | |
| Work situation | | | | 0.484 |
| paid job | 49 (57.6) | 48 (57.1) | 97 (57.4) | |
| student | 2 (2.4) | 1 (1.2) | 3 (1.8) | |
| different | 34 (40.0) | 35 (41.7) | 69 (40.8) | |

**Drop-outs**

In total, 169 participants completed the baseline questionnaires, 149 completed T1 (88.2%), 112 completed T2 (66.3%), and 132 (78.1%) participants completed the post-test. A Chi-square test indicated that there were significantly more drop-outs in the intervention condition (32.1%) compared to the WL condition (9.6%) $\chi^2$ (1) = 12.76, $p < 0.001$. Drop-outs

and completers differed significantly regarding marital status $\chi^2$ (3) = 10.54, $p$ = 0.014 and age t(165) = -3.028, $p$ = 0.003, indicating that participants who were not married and younger were more inclined to drop out. Regarding outcome measures at baseline, a Chi-square test indicated no significant difference between drop-outs and completers on flourishing. However, an independent-samples t-test and Chi-square tests revealed a marginal significant difference between drop-outs and completers on grateful mood t(165) = -1.718, $p$ = 0.088 and a significant difference on feeling calm $\chi^2$ (6) = 17.21, $p$ = 0.009. These findings indicate that the level of grateful mood and feeling calm were lower at baseline for drop-outs compared to completers.

The bivariate correlations between the outcome measures are depicted in Table 2. The specific positive emotions were positively and statistically significantly related to flourishing ($ps$ < 0.05), except for feeling surprised ($p$ = 0.154), moved ($p$ = 0.888) and warm-hearted ($p$ = 0.058). Pearson correlations were very weak ($r$ = 0.16) to moderate ($r$ = 0.48), with feeling loving showing the strongest association with flourishing ($r$ = 0.40) indicating that people who are flourishing experience love to a greater extent.

Table 2

*Bivariate correlations between the specific positive emotions and flourishing at baseline*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Interested | 1.00 | | | | | | | | | |
| 2. Moved | 0.04 | 1.00 | | | | | | | | |
| 3. Warm-hearted | -0.03 | 0.09 | 1.00 | | | | | | | |
| 4. Joyful | 0.10 | -0.06 | 0.48*** | 1.00 | | | | | | |
| 5. Satisfied | 0.15 | 0.23** | 0.21** | 0.39*** | 1.00 | | | | | |
| 6. Surprised | 0.03 | 0.22** | 0.06 | 0.13 | 0.11 | 1.00 | | | | |
| 7. Loving | 0.37*** | 0.11 | 0.19* | 0.27*** | 0.41*** | 0.18* | 1.00 | | | |
| 8. Calm | -0.01 | -0.03 | 0.15 | 0.23** | 0.11 | 0.18* | 0.16* | 1.00 | | |
| 9. Grateful | 0.26** | 0.27*** | 0.10 | 0.36*** | 0.45*** | 0.30*** | 0.33*** | 0.31*** | 1.00 | |
| 10. Flourishing | 0.21** | 0.01 | 0.15 | 0.27*** | 0.39*** | 0.11 | 0.40*** | 0.17* | 0.31*** | 1.00 |

* $p < 0.05$, two-tailed.

** $p < 0.01$, two-tailed.

*** $p < 0.001$, two-tailed.

**Effects on flourishing and specific positive emotions**

A Chi-square test showed that there were significantly more flourishers in the intervention condition (37.9%) compared to the WL condition (18.7%) at post-test $\chi^2$ (1) = 6.149, $p$ = 0.013 (Table 3).

Table 3

*Comparison of flourishers vs. non-flourishers between conditions at post-test*

| | Intervention group | | WL | | $p$ |
|---|---|---|---|---|---|
| | Flourishers | Non-flourishers | Flourishers | Non-flourishers | |
| | n (%) | n (%) | n (%) | n (%) | |
| Baseline (n=169) | 12 (14.1) | 73 (85.9) | 13 (15.5) | 71 (84.5) | 0.730 |
| Post-test (n=133) | 22 (37.9) | 36 (62.1) | 14 (18.7) | 61 (81.3) | 0.013 |

Results of the ANCOVA's showed a significant effect during the intervention on feeling calm after two week's intervention, while controlling for baseline levels ($p$ = 0.047, $d$ = 0.34), which indicates that feeling calm was experienced significantly more in the intervention condition after two weeks compared to the WL condition (Table 4). For feeling moved a marginally significant effect was detected ($p$ = 0.051, $d$ = 0.32). After four week's intervention, a significant effect of condition on feeling loving ($p$ = 0.008, $d$ = 0.61) and feeling grateful ($p$ < 0.001, $d$ = 0.86) was revealed.

At post-test, ANCOVAs revealed a significant effect of condition on all positive emotions when controlling for baseline levels, except for feeling calm (Table 4). This finding indicates that feeling grateful, satisfied, surprised, loving, interested, moved, warm-hearted and joyful were experienced to a significantly higher degree in the intervention condition compared to the WL condition at post-test ($ps$ < 0.05). Effect sizes ranged from small ($d$ = 0.32) to medium ($d$ = 0.74). For feeling calm, a marginally significant effect was found in the intervention condition F(1, 129) = 3.620, $p$ = 0.059, indicating higher effects on feeling calm during the intervention, but the extent to which participants in the WL condition experienced feeling calm became higher at post-test.

Table 4

*Means (SDs) and Cohen's d effect sizes for the specific positive emotions by condition*

| | Intervention group | | WL group | | | | |
|---|---|---|---|---|---|---|---|
| | n | Mean *(SD)* | n | Mean *(SD)* | F | *p* | *d* |
| Interested | | | | | | | |
| Baseline (T0) | 85 | 4.01 (1.26) | 84 | 4.23 (1.08) | | | |
| 2-weeks (T1) | 67 | 4.31 (1.20) | 82 | 4.10 (1.18) | 1.97 | 0.162 | 0.18 |
| 4-weeks (T2) | 38 | 4.34 (0.97) | 74 | 4.18 (1.00) | 0.73 | 0.395 | 0.16 |
| Post-test (T3) | 58 | 5.34 (1.13) | 74 | 4.89 (1.17) | 5.96 | 0.016 | 0.39 |
| Moved | | | | | | | |
| Baseline (T0) | 85 | 3.35 (1.82) | 84 | 3.43 (1.98) | | | |
| 2-weeks (T1) | 67 | 3.42 (1.64) | 82 | 2.87 (1.84) | 3.88 | 0.051 | 0.32 |
| 4-weeks (T2) | 38 | 3.71 (1.77) | 74 | 3.05 (1.99) | 2.64 | 0.107 | 0.35 |
| Post-test (T3) | 58 | 3.55 (1.93) | 74 | 2.76 (1.54) | 6.96 | 0.009 | 0.45 |
| Warm-hearted | | | | | | | |
| Baseline (T0) | 85 | 3.47 (1.62) | 84 | 3.82 (1.55) | | | |
| 2-weeks (T1) | 67 | 3.66 (1.66) | 82 | 3.49 (1.47) | 1.33 | 0.250 | 0.11 |
| 4-weeks (T2) | 38 | 3.63 (1.40) | 74 | 3.68 (1.52) | 0.01 | 0.943 | 0.03 |
| Post-test (T3) | 58 | 4.40 (1.54) | 74 | 3.92 (1.52) | 4.13 | 0.044 | 0.32 |
| Joyful | | | | | | | |
| Baseline (T0) | 85 | 3.86 (1.66) | 84 | 3.74 (1.46) | | | |
| 2-weeks (T1) | 67 | 4.15 (1.60) | 82 | 3.90 (1.40) | 0.81 | 0.370 | 0.17 |
| 4-weeks (T2) | 38 | 4.18 (1.35) | 74 | 3.72 (1.46) | 2.63 | 0.108 | 0.33 |
| Post-test (T3) | 58 | 4.95 (1.48) | 74 | 4.11 (1.48) | 10.42 | 0.002 | 0.57 |
| Satisfied | | | | | | | |
| Baseline (T0) | 85 | 3.87 (1.46) | 84 | 3.60 (1.36) | | | |
| 2-weeks (T1) | 67 | 3.93 (1.71) | 82 | 3.91 (1.28) | 0.11 | 0.742 | 0.01 |
| 4-weeks (T2) | 38 | 4.37 (1.28) | 74 | 3.93 (1.36) | 0.59 | 0.443 | 0.33 |
| Post-test (T3) | 58 | 5.10 (1.19) | 74 | 4.49 (1.51) | 4.86 | 0.029 | 0.45 |
| Surprised | | | | | | | |
| Baseline (T0) | 85 | 2.95 (1.89) | 84 | 3.02 (1.86) | | | |
| 2-weeks (T1) | 67 | 3.42 (1.78) | 82 | 2.96 (1.91) | 2.09 | 0.150 | 0.25 |
| 4-weeks (T2) | 38 | 3.45 (1.74) | 74 | 2.86 (1.80) | 2.68 | 0.104 | 0.33 |
| Post-test (T3) | 58 | 3.41 (1.74) | 74 | 2.77 (1.58) | 4.93 | 0.028 | 0.39 |
| Loving | | | | | | | |
| Baseline (T0) | 85 | 3.87 (1.44) | 84 | 3.85 (1.22) | | | |
| 2-weeks (T1) | 67 | 4.45 (1.68) | 82 | 4.21 (1.31) | 0.80 | 0.373 | 0.16 |
| 4-weeks (T2) | 38 | 4.68 (1.14) | 74 | 3.96 (1.21) | 7.40 | 0.008 | 0.61 |
| Post-test (T3) | 58 | 5.41 (1.26) | 74 | 4.89 (1.28) | 4.68 | 0.032 | 0.41 |

Table 4

*Continued*

| | Intervention group | | WL group | | | | |
|---|---|---|---|---|---|---|---|
| | n | Mean *(SD)* | n | Mean *(SD)* | F | *p* | *d* |
| Calm | | | | | | | |
| Baseline (T0) | 85 | 3.86 (1.63) | 84 | 3.63 (1.46) | | | |
| 2-weeks (T1) | 67 | 4.01 (1.67) | 82 | 3.50 (1.34) | 4.01 | 0.047 | 0.34 |
| 4-weeks (T2) | 38 | 3.97 (1.67) | 74 | 3.74 (1.45) | 0.62 | 0.432 | 0.15 |
| Post-test (T3) | 58 | 4.81 (1.39) | 74 | 4.28 (1.57) | 3.62 | 0.059 | 0.36 |
| Grateful | | | | | | | |
| Baseline (T0) | 85 | 4.81 (1.17) | 84 | 4.57 (1.23) | | | |
| 2-weeks (T1) | 67 | 5.39 (1.12) | 82 | 5.01 (1.06) | 1.45 | 0.230 | 0.35 |
| 4-weeks (T2) | 38 | 5.84 (1.12) | 74 | 4.81 (1.27) | 13.13 | 0.000 | 0.86 |
| Post-test (T3) | 58 | 5.66 (1.07) | 74 | 4.77 (1.30) | 20.38 | 0.000 | 0.74 |

**Mediation**

Multiple mediation analyses were executed in which the mediation measures of the specific positive emotions were entered simultaneously into the model (Figure 2). The a-paths were significant for feeling moved ($b$ = .60, $p$ = .031), loving ($b$ = .51, $p$ = .017), calm ($b$ = .44, $p$ = .039) and grateful ($b$ = .64, $p$ = .001), showing that condition was a significant predictor for these emotions during the intervention. The b-paths were all non-significant ($p$ > .05), indicating no effect of the specific positive emotions during the intervention on flourishing at post-test. However, marginally significant effects were found for feeling surprised ($b$ = .36, $p$ = .069) and grateful mood ($b$ = .66, $p$ = .058), pointing towards a tendency that experiencing these two emotions to a greater extent during the intervention predicted the number of flourishers at post-test. The direct effect (c'-path) of the treatment condition on flourishing was also not significant ($b$ = .46, $p$ = .385). None of the indirect effects were significant except for grateful mood (95% *CI* = 0.031; 1.31). Thus, the effect of the gratitude intervention on flourishing at post-test was mediated through the increased level of feeling grateful during the intervention, compared to waitlist.

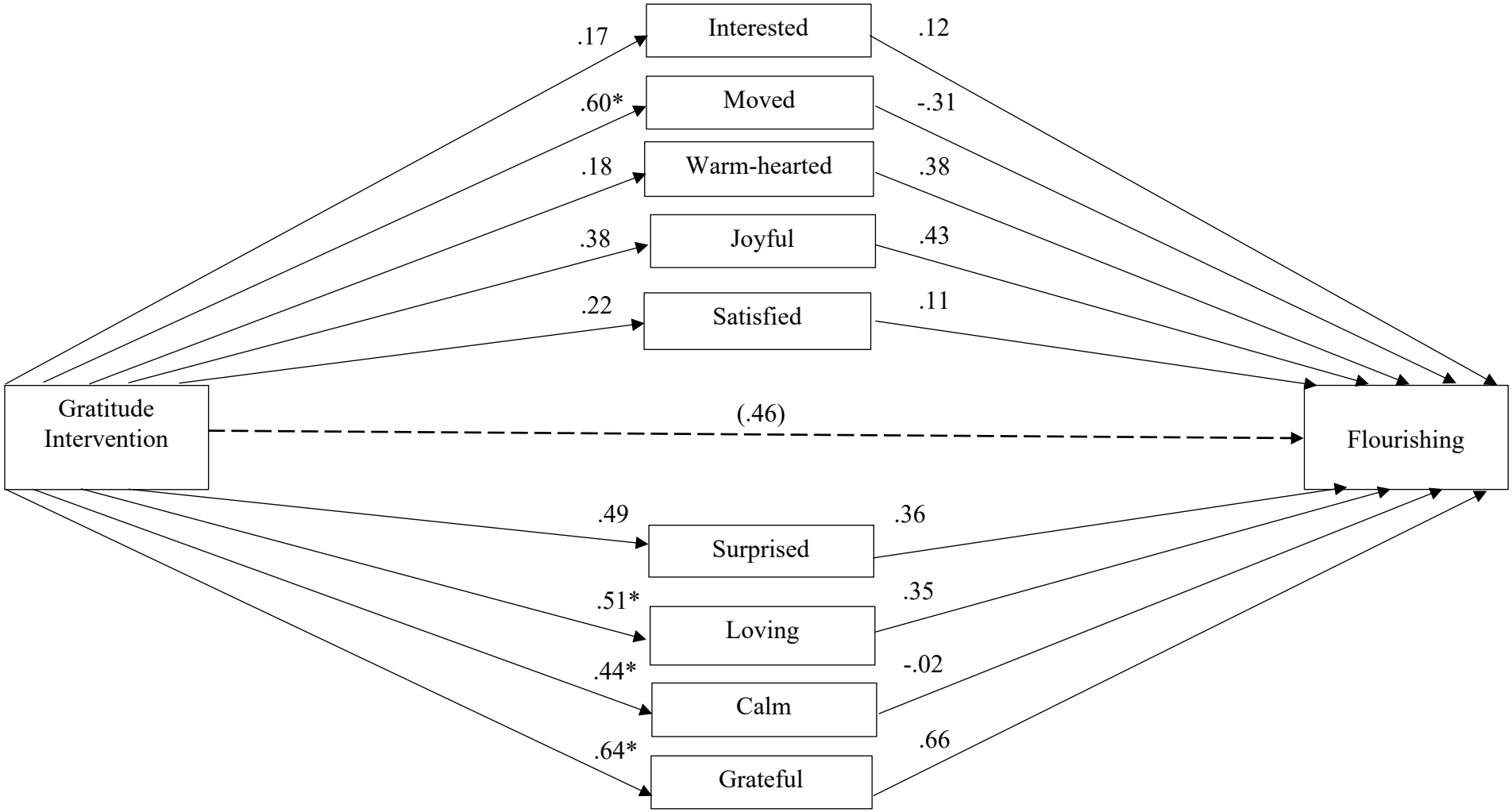


*Figure 2.* Multiple mediation of specific positive emotions as mediators (T1+T2) of intervention vs. WL on flourishing at post-test. The total effect is given in parentheses.

Notes: Unstandardized coefficients are shown; *p < 0.05

## Discussion

This study examined the effectiveness of a six-week gratitude intervention on flourishing and enhancing nine specific positive emotions. To the authors' knowledge, this was the first study to do so, rather than examining overall positive emotionality, in the enhancement of flourishing. The results showed that the gratitude intervention led to significantly more flourishers at post-test and a significant effect of the gratitude intervention at post-test on enhancing eight out of nine specific positive emotions compared to a waitlist control group. Results revealed that the gratitude intervention was effective in enhancing feeling calm after two weeks as well as feeling loving and grateful after four weeks. However, only feeling grateful during the intervention, was found to mediate the relationship between the intervention condition and more flourishers at post-test.

### Effect on flourishing

As expected, results showed that the gratitude intervention had a significant positive effect on flourishing at post-test, which is in line with and adds to previous research. So far scholars studied the effectiveness of gratitude interventions mainly on hedonic and/or eudaimonic well-being, but not on flourishing defined as possessing high levels of both hedonic and eudaimonic well-being as this study did. Emmons and McCullough (2004), for example, studied the effects of a gratitude intervention on different well-being outcomes and found that the gratitude intervention led to a more positive outlook, appraisal of life, and increased life satisfaction, with the latter being an important component of hedonic well-being. Also, in a meta-analysis by Dickens (2017) it is shown that gratitude interventions have beneficial effects on happiness and life satisfaction.

The positive effect of the gratitude intervention in the present study on the whole spectrum of well-being, namely flourishing, may be explained by the social component of gratitude. Gratitude is a positive emotion that is often other-directed (Jans-Beken et al., 2019) and characterized by prosocial behavior (Emmons & McCullough, 2004). In addition to that, one of the intervention exercises in this study was to express gratitude explicitly towards another person. By means of these processes, it might be partly explained that gratitude interventions not only enhance hedonic aspects of well-being such as happiness and life satisfaction but also eudaimonic aspects of well-being such as social coherence or positive relations.

Further support for this line of reasoning comes from a study by Killen and Macaskill (2014) who included eudaimonic and hedonic well-being in their study but studied the effect of a gratitude intervention on these well-being measures separately. It was found that the

gratitude intervention led to a significant increase of eudaimonic but not hedonic well-being. A possible explanation of the contradictory results of Killen's and Macaskill's study to the results by the studies of Emmons and McCullough (2004) and Dickens (2017) who did find effects of gratitude interventions on hedonic well-being might be explained by Killen's and Macaskill's sample. Their sample was composed of older adults (Mean age = 70.84), which might explain the non-significant effect on hedonic well-being. In sum, this study supports the notion of gratitude interventions being effective in promoting flourishing including high levels of both hedonic and eudaimonic well-being, and not only one of these dimensions.

**Effect on specific positive emotions**

Results of this study showed that a six-week gratitude intervention led to a significantly greater increase in eight out of nine positive emotions at post-test compared to a waitlist control group. In particular, the strongest difference between the two conditions was found for feeling joyful and grateful with medium effect sizes. However, only a marginally significant increase of feeling calm at post-test could be detected. Several studies support the notion that gratitude interventions lead to an increase of overall positive emotionality while this study was the first to examine which specific positive emotions are enhanced by a gratitude intervention.

Sheldon and Lyubomirsky (2006), for example, examined whether a four-week gratitude intervention (counting one's blessings) would lead to increased overall positive emotions and found a significant effect at post-test. However, their study demonstrated that another intervention condition (best possible selves) outperformed the gratitude condition regarding the improvement in positive emotions. While Sheldon's and Lyubomirsky's (2006), findings may underestimate the effectiveness of gratitude interventions it is worth mentioning that the duration of the present gratitude intervention lasted two weeks longer. In general, higher effect sizes for longer PPI's have been found (Chakhssi, Kraiss, Sommers-Spijkerman, & Bohlmeijer, 2018). Support for the assumption that time plays an important role in the enhancement of positive emotions is also provided by Berger et al. (2019). In their study, a three-week gratitude intervention did not lead to an increase of positive emotions. They speculated that positive emotions might be harder to change than negative emotions. Interestingly, also results of the between group- and mediation analyses of the present study showed that the effect of the intervention on the specific positive emotions increased over time. More specifically, the effect for most of the nine positive emotions was not significant after two and four weeks, but at post-test after six weeks it was. Thus, the present study and prior studies point in the direction that a longer duration of interventions is needed to ensure

that gratitude interventions are effective in enhancing the experience of specific positive emotions and overall positive emotionality.

Another point to be considered regarding the effectiveness of gratitude interventions in the enhancement of (specific) positive emotions is the intervention's composition. In contrast to the study by Sheldon and Lyubomirsky (2006) whose gratitude intervention was outperformed by another intervention condition and to the study by Berger at al. (2019) who did not find an effect of a gratitude intervention on positive emotions at all, was the intervention in the present study composed of six different gratitude exercises. This variety may have affected the specific positive emotions through several pathways (e.g. reflecting, expressing), which may be more effective compared to a single pathway (e.g. only expressing). Additionally, Sheldon and Lyubomirsky (2006) provided evidence for the importance that participants' values are congruent with the intervention. By providing different exercises, the present study may have provided a better "fit" between exercise and participant than the studies by Sheldon and Lyubomirsky (2006) and Berger et al. (2019). Thus, the present study suggests that a diversified intervention composition may be superior to a monotonous intervention in enhancing (specific) positive emotions.

Finally, the results of the present study which support the effectiveness of a gratitude intervention on positive emotions to a somewhat greater extent than prior studies might be explained by how positive emotions were assessed. In the studies by Sheldon and Lyubomirksy (2006) and Berger et al. (2019), the PANAS was used to assess overall positive emotions. It is described that this scale is biased towards high arousal positive emotions (Sheldon & Lyubomirsky, 2006). The mDES scale, which was used in the present study, makes use of high and low arousal positive emotions (Cohn & Fredrickson, 2009). Also, the effect on the separate emotions was investigated rather than on overall positive emotions, which gives a more differentiated picture of the effect of a gratitude intervention. More specifically, the strongest difference between the two conditions was found for feeling joyful and grateful, which is in line with earlier studies. Dickens (2017) found in a meta-analysis significant effects of gratitude interventions on grateful mood compared to active- and waitlist control conditions. While it seems obvious that a gratitude intervention leads especially to an enhancement of feeling grateful compared to other emotions, results of prior studies support the found effect of the present study on feeling joyful. Watkins et al. (2017), for example, found that gratitude and joy are strongly linked to each other and hypothesized that grateful people are more likely to experience joy. This link between gratitude and joy may explain why the gratitude intervention had especially an effect on feeling joyful and grateful. In sum,

this research provides evidence for the effectiveness of gratitude interventions on enhancing specific positive emotions.

**Role of specific positive emotions on flourishing**

Contrary to expectation, increased levels of the specific positive emotions during the intervention were not found to significantly predict more flourishers at post-test. It was expected that especially feeling joyful and grateful during the intervention would lead to an increase in flourishing since both of these emotions have been found to be involved in the enhancement of well-being (Watkins et al., 2018). However, only marginally significant effects were found for feeling grateful and feeling surprised.

Garland et al. (2010) explain, based on the Broaden-and-Build Theory, that positive emotions induce an "upward spiral of flourishing" meaning that the experience of one positive emotion leads automatically to the experience of other positive emotions, which in turn leads to flourishing. A possible explanation why results of the present study indicated that experiencing a specific positive emotion did not lead to flourishing may be that a certain threshold or extent of experiencing a specific positive emotion needs to be achieved until an upward spiral towards flourishing is set in motion. It has already been described that most of the specific positive emotions showed the largest increase at post-test after six weeks, and not during the intervention which may explain why experiencing specific positive emotions during the intervention did not lead to flourishing at post-test. In addition to that, apart from the intensity of experiencing a specific positive emotion, it may be possible that a set of several specific positive emotions is needed in order to induce an upward spiral towards flourishing. While feeling surprised and grateful tended to be more important for flourishing compared to other feelings, a combination of these two emotions may have led to flourishing. Thus, while no specific positive emotion was found to predict flourishing there are possibly several other factors such as intensity or compilation of the positive emotions that need to be taken into account when studying the role of specific positive emotions in enhancing flourishing.

A final explanation for the unexpected results may be based on the used definition of flourishing. The present study defined flourishing as possessing high levels of both eudaimonic and hedonic well-being in line with Keyes et al. (2002). While Fredrickson underscores in several studies that positive emotions lead to flourishing (e.g. Fredrickson, 2001; Fredrickson & Losada, 2005), the dichotomous classification of flourishing was not used, as opposed to the current study. For example, in the often-cited study by Fredrickson and Joiner (2002) it was shown that positive emotions lead to increased emotional well-being,

but flourishing was not included as an outcome measure. In one study where the same dichotomous classification of flourishing as in the present study was used, Catalino and Fredrickson (2011) found that positive emotional reactivity predicted higher levels of flourishing. However, those individuals were already classified as flourishers before, indicating that flourishers may experience more positive emotions and not vice versa. To conclude, the present study provides no evidence for the beneficial effects of experiencing specific positive emotions in enhancing flourishing.

**Strengths and limitations**

An important strength of this study is that the gratitude intervention was composed of different exercises which prevented monotony as well as boredom, and promoted a good fit between participant and intervention. Also, the duration of six weeks of the intervention is one of the strengths of the study, as prior studies used shorter durations and concluded limited effectiveness of gratitude interventions. Finally, the present study focused on the whole spectrum of well-being by using flourishing defined as possessing high levels of subjective, social, and psychological well-being, rather than only a single dimension as other studies did.

Nevertheless, the study has also some limitations. First, the sample was mainly composed of higher educated women. The problem of an unequal gender participation has been reported before in similar studies (Schotanus-Dijkstra et al., 2017). Previous studies found gender differences in emotion expression (Chiang, 2018) and on well-being dimensions (Sun, Chan, & Chan, 2018). Therefore, the found results should be interpreted with caution, especially regarding generalizability of the findings to men. Future research within the field of PPI's should therefore find options to recruit a more representative sample which is diverse regarding educational level and includes more male participants. One possibility to achieve this is by placing advertisement which is explicitly targeted at males, for example in male-dominated organizations.

Second, the mDES questionnaire had a low internal consistency for the positive emotions' subscale (alpha = 0.59). Since the original scale is French and to date no study exists that examined the psychometric properties of the mDES in a Dutch sample, it is possible that the Dutch version of the mDES needs improvement, for example regarding translation. Also, Fredrickson, Tugade, Waugh, and Larkin (2003) developed a version of the mDES with twelve positive emotions based on the Broaden-and Build Theory including awe, amusement, excitement, gratitude, hope, inspiration, interest, joy, love, pride, contentment, and serenity. Future research should test the psychometric qualities of the Dutch version and should work towards a standard set of the mDES.

Finally, in the current study no active control group was implemented. By only using a waitlist control group for comparison, the results may have been overestimated. However, prior research found that gratitude interventions are also more effective in enhancing positive affect, happiness, and life satisfaction compared to active control conditions (e.g. listing activities of the day) (Dickens, 2017). Still, future research should incorporate an active control group when examining the effectiveness of gratitude interventions on enhancing specific positive emotions. Through this, it could be better investigated whether the effects come from the intervention itself or from some other factors such as getting more attention as a participant.

**Practical implications and directions for future research**

Findings of this study are relevant for healthcare professionals, policy, and society. The ROAMER project describes that 38% of European individuals suffer from some kind of mental disease each year (Forsman et al., 2015). Since flourishing has been found to protect against first-onset of mood and anxiety disorders (Schotanus-Dijkstra, ten Have, et al., 2016), the findings of the current study wherein flourishing was increased by practicing gratitude might indicate that also mental health complaints decreased. However, this was not tested directly and mental complaints should also be integrated as an outcome measure in similar research.

Another important implication for healthcare professionals and society is that the gratitude intervention of the current study seems to be a promising self-help intervention. Since the mental healthcare costs are rising, new and affordable ways for promoting and protecting mental health in the general population are needed (van Germet-Pijnen, Kelders, Kip, & Sanderman, 2018; van Mens et al., 2018). One way to do so is by implementing interventions in individuals every-day life as the current study did. More specifically, the comprehensive gratitude intervention of this study could be integrated as a continuing homework assignment next to face-to-face treatment sessions. Previous studies have provided support for the cost-effectiveness of self-help interventions within stepped-care treatment models (Lewis, Pearce, & Bisson, 2012). It is therefore worth investigating whether the gratitude intervention of the current study could be implemented as cost-effective self-help intervention. However, to make sure whether the gratitude intervention of the present study is applicable and effective for the general population, more research is also needed to replicate findings of this study across more diverse samples.

A final implication for healthcare professionals and scholars is that this study recognizes that different positive emotions have different effects on individuals' well-being.

Thereby a starting point is provided for developing purposeful interventions. Interventions which target the emotions that seem to be more beneficial in promoting flourishing, which were feeling surprised and grateful may be more effective than interventions that target overall positive emotionality (Shiota et al., 2017). However, since this study found no support that specific positive emotions lead to flourishing, future studies should examine whether a certain extent of experiencing specific positive emotions or a certain compilation of several specific positive emotions is needed after which flourishing is promoted. In this regard, scholars should conduct experimental studies which compare different gratitude interventions with each other to test whether the earlier discussed assumptions regarding the interventions' duration and composition hold true.

**Conclusion**

Altogether, this study showed the beneficial effects of a gratitude intervention on enhancing flourishing as well as on specific positive emotions, and the differentiating role of specific positive emotions on flourishing. As only 36.5% of the Dutch population is flourishing (Schotanus-Dijkstra, Pieterse, et al., 2016), more research of the function of specific positive emotions in promoting flourishing is needed. This could be done by examining the preconditions from which beneficial effects of experiencing specific positive emotions emerge such as intensity or composition. Based on the current study, more effective treatments may be developed by implementing gratitude exercises as self-help interventions that target specific positive emotions. While the importance of flourishing mental health has been recognized, ways to achieve this state need to be identified. A precondition for any future research about flourishing is a clear definition to enable reliable conclusions. Often well-being and flourishing are used interchangeably which makes a comparison of different studies difficult (see also Hone, Jarden, Schofield, & Duncan, 2014 for a discussion). Meanwhile, it is well-advised that individuals try to be grateful in everyday life in order to feel loving, calm, and moved and come one step closer towards flourishing.

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