Master Thesis

The influence of the depth of reflection on well-being outcomes during a gratitude intervention

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Table of Contents

Abstract

Written reflection tasks are common elements in therapeutic interventions. However, it remains unclear, if and how the reflections contribute to the effectiveness of the interventions. This explorative study investigates first, the effectiveness of a self-help gratitude intervention and second, the role of reflections within this intervention and the influence of reflective depth on mental well-being (emotional, social & psychological), gratitude and positive and negative emotions. 54 participants from the general public took part in a validated 6-weeks gratitude intervention and wrote a reflection on their progress on a weekly basis. The reflections were analysed with the REFLECT Rubric, a coding scheme consisting of 5 dimensions, to evaluate written reflections. Mental well-being was measured with the Mental Health Continuum- Short Form (MHC-SF), positive and negative emotions with the modified Differential Emotions Scale (mDES). Gratitude was measured with Short Gratitude Resentment and Appreciation Test (SGRAT) on a pre- and post-test measurement. Paired-sample t-tests indicate positive effects of the intervention on mental well-being, gratitude and positive respectively negative emotions. Correlational analyses revealed weak correlations between reflective depth and improvements in emotional well-being and positive emotions. The results indicate that the stimulation of deep reflecting within interventions can help to improve their effectiveness.

Introduction

Gratitude in Positive Psychology

In the last years, positive psychologists conducted a high amount of research in order to find out what makes life worth living (Seligman, Steen, Park, & Peterson, 2005). In these studies, some central topics became salient, whereof gratitude results to be among the most important and highest associated character strengths with life satisfaction (Park, Peterson, & Seligman, 2005). Many different definitions of gratitude exist (Algoe, Fredrickson, & Gable, 2013; Emmons & McCullough, 2003; Emmons & Stern, 2013; Seligman et al., 2005) but the elements they all have in common are best summarized as follows: *"Being aware of and thankful for the good things that happen"* (Seligman et al., 2005) (p.876). It was further found, that there cannot exist "too much" of any character strength which would reduce life satisfaction (Park et al., 2005) and that gratitude is universal across all cultures and embedded in many spiritual or religious ceremonies (Emmons & Stern, 2013; Seligman et al., 2005).

One of the most prominent authors in the field of gratitude research is Robert A. Emmons who, among others, investigated the effects of gratitude in well-being, but also its' effectiveness in psychotherapy (Emmons & McCullough, 2003; Emmons & Stern, 2013). Emmons and Stern (2013) state that the experience of gratitude is constituted of two internal processes. The first is the affirmation of the good things that can happen in life, it is about the perception and the recognition of the positive experiences one makes in his life. The second process refers to the awareness that these positive experiences can also come from outside the self, from others. As postulated by Emmons and Stern (2013), the natural reaction on these processes is the experience of warm and positive feelings towards the other which results in a behavioural response and the wish to give something back in one or another way.

Research on interventions shows, that gratitude interventions in general seem to have positive effects mental well-being (Wood, Froh, & Geraghty, 2010) and that weekly diary

exercises about gratitude resulted in higher positive emotional states (Emmons & McCullough, 2003). The healing effect of gratitude interventions seems to be allocated in the interactional and relational space between two interaction partners. The resulting positive emotions and the feeling of relatedness towards the other have a positive effect on well-being (Emmons & Stern, 2013). Besides the state-like conceptualization of gratitude, targeted in the described interventions, gratitude can also be regarded as a trait-like character strength and is as such highly connected to mental health, more than other personality characteristics. Individuals that are very grateful, experience more positive emotions, have better coping mechanisms, are more resilient, recover faster from illnesses and are in better physical condition (Emmons & Stern, 2013). Gratitude seems thus to work like a medicine against mental illness. Or in the words of Emmons and Stern (2013), gratitude is *"as elemental as life itself. In many world ethical systems, gratitude is the shaping and compelling force behind acts of compassion because life is seen as a vast network of interdependence, interpenetration, and mutuality that constitutes being."* (p. 847).

Reflecting about one's learning process

The aims of therapeutic interventions are mostly that participants learn to conduct new behaviour or learn new ways of thinking. The success of therapeutic interventions is thus related to learning outcomes. As suggested by Veenman (2008), an estimated 40% of the variance in learning outcomes is accounted to metacognitive skilfulness. Metacognitive skilfulness is here described as the activities and the repertoire of knowledge of a person to guide, control and monitor the behaviour related to a specific task (Veenman & Alexander, 2011). Metacognitive skilfulness can also be described as reflective capacity or the ability to think about the learning processes on a meta-level. The reflective abilities can be assessed by different types of methods, for example by using think-aloud protocols, observations or diaries (Veenman & Alexander, 2011).

Learning diaries or written reflections can be categorized into four levels of reflection, according to the depth of the reflection (Kember, Mckay, Sinclair, & Kam Yuet Wong, 2008; Wald, Borkan, Taylor, Anthony, & Reis, 2012). Here, lower levels indicate superficial or nonreflective reports, whereas higher levels indicate more profound reflective reports. The evaluation and classification of reflective reports into the different levels can be done on five different domains. These are the writing spectrum, sense of presence, description of a conflict or dilemma, attending to emotions and analysis and meaning making. The five domains stem from the REFLECT Rubric, a coding scheme to assess the quality of written reflective reports (Wald et al., 2012) (Table 3).

The lowest level is *habitual action,* which is a nonreflective and descriptive report. Here, the content is just written down, without attempts to understand the surroundings. The writer is perceived as absent or partially present, and there exists no description of a dilemma, conflict, issue or concern. In the habitual action level, little or no recognition or attention to emotions is present. Further, the writer makes no analysis of the happening and meaning making is absent (Kember et al., 2008; Wald et al., 2012). The second level, which can be called *thoughtful action or introspection* (Wald et al., 2012) or *understanding* (Kember et al., 2008) refers to a report which reveals that the writer achieved a basic understanding of the topic. The text is elaborated, contains details and impressions but lacks reflective elements. The writer seems just partially to be present and the writing contains no or just weak dilemmas, conflicts or challenges. Emotions are recognized but do not receive special attention or are further explored. The situation is not, or just weakly and unclearly analysed and no meaning making takes place (Kember et al., 2008; Wald et al., 2012). The third level, *reflection,* can mostly be distinguished from the second level by the degree of relatedness to the self. Here, the concepts are related to the writer's personal experience and enriched with personal insights (Kember et al., 2008). Further, the writing is more than just descriptive, it contains reflections which combine and integrate the single elements into a bigger picture.

The sense of presence is high, the writer takes the reader by his hand, writes vividly and focusses on details. The writer pays attention to emotions, they are recognised and explored. Further, the reflection contains some analysis and meaning making (Wald et al., 2012). The fourth and highest level is the *critical reflection.* Whereas some authors claim the necessity of changes of beliefs to acquire this highest level (Kember et al., 2008), others provide a more pragmatic approach, without the necessity of transformative learning (Wald et al., 2012). At the *critical reflection level,* assumptions are questioned, criticised and explored. Consequences for future or present actions are explored and analysed. The reader gets the feeling of the writer being fully present and possible dilemmas, or conflicts are fully described, explored and analysed on alternative explanations, implications and include multiple perspectives. Emotions receive high attention, are recognised, and explored. The writer shows a gain of emotional insight. Finally, the text shows comprehensive analyses and the writer makes meaning of the whole (Wald et al., 2012).

Reflection and well-being

Research about the association between reflective abilities and well-being is scarce. Elliott and Coker (2008) found controversial effects of self-reflection on happiness (Elliott & Coker, 2008) in clinical contexts. In their study about the relation between personality and the mediating role of self-reflection they found that on the one hand, self-reflection can have a direct positive influence on happiness and mental well-being. But on the other hand, it can also have an indirect negative effect on happiness and mental well-being, when mediated by rumination (Elliott & Coker, 2008). However, in another study it was found that reflective writing is a common element in different therapeutic approaches (such as self-help intervention or classical psychotherapy) and results to have positive effects on physical and mental health (Wright & Chung, 2001). In their review of literature about reflective writing in therapy, Wright and Chung (2001) state, that the role of the content (reflective depth) of the

reflections remains still unclear. They propose, that it might also be the writing itself that has healing power. Wright and Chung (2001) further found, that the majority of the studies, investigating the therapeutic effects of reflective writing are embedded in classical psychotherapy with a therapist who helps the participants with the reflections and/or makes these reflections matter of conversation (Wright & Chung, 2001). Different effective positive psychological interventions, aiming to improve well-being, contain reflection tasks (Emmons & McCullough, 2003; Meier, Cho, & Dumani, 2016) but research about the specific role of the reflections within these studies is still lacking. This study aims to narrow that gap and investigate to which degree reflective depth within a self-help intervention contributes to the effectiveness of a gratitude intervention.

Current study

First aim of this study is to investigate if the gratitude intervention led to positive changes for the participants regarding mental well-being, gratitude, and the experience of positive and negative emotions. It is hypothesized that participants experience increases in mental well-being (emotional, social and psychological well-being), gratitude and positive emotions as well as decreases in negative emotions (H1).

The second aim of this explorative study is to investigate the influence of reflective depth in written reflections on well-being in a gratitude intervention. Higher metacognitive skills and higher reflective abilities are supposed to lead to better learning outcomes, which in the context of the gratitude intervention would lead to higher degrees of well-being. It is thus expected, that the depth of reflection is associated with positive effects on mental well-being, positive and negative emotions, and gratitude (H2).

Method and Design

The current study is part of a large RCT study (Nelson, Bohlmeijer, & Schotanus-Dijkstra, submitted) on happiness exercises. *Gratitude* was one of the five conditions (*acts of kindness with reflection; acts of kindness without reflection; gratitude; active control-condition; wait-list condition*). The current study used a within-group design. The participants completed various questionnaires of which the baseline (T0) and post-test measurement (T1) were used in the current study. Besides the tasks of the intervention, the participants were also invited to reflect on their learning processes. Therefore, the participants were asked to write weekly reflections about the exercises, their experiences and their progress. These reflections were qualitatively examined for reflective depth.

The independent variables were the five criteria of the REFLECT Rubric from the qualitative analyses (*Writing Spectrum, Presence, Attending to emotions, Description of conflict or dilemma* and *Analysis and meaning making*). The dependent variables were the difference scores of the emotional, social and psychological well-being, gratitude and positive and negative emotions.

Participants and Procedure

Participants were recruited from the general public through advertisements in Dutch newspapers, social media and the online newsletter from a popular psychology magazine. Interested people could then sign in and find further information on a special website about the study, where they were asked to agree on the informed consent and complete a screening questionnaire, which consisted of three scales: Mental Health Continuum Short Form (MHS-SF), Center for Epidemiological Studies Depression Scale (CES-D) and Generalized Anxiety Disorder 7 items (GAD-7). Participants with moderate or serious depressive or anxiety symptoms were excluded. Cut-off scores were as follows: "34" or higher on the CES-D

and/or "15" or higher on the GAD-7. Individuals who were excluded based on these exclusion criteria received the advice to search for professional help. The exclusion criteria were not reported in the participants' information in order to not bias the screening. 85 participants were assigned to the gratitude condition, relevant for the current study.

After the participants completed the screening-questionnaire, they could go further to the pre-test measurement. Then, they started with the activities from the intervention which will be described in detail below. After they finished the last exercise of the intervention, participants completed the post-test measurement. The data was collected online. Participants were excluded from analyses if they did not complete the post-test measurement or if they wrote less than 3 reflections. This criterium was selected in order to only consider those participants who were engaged in at least the half of the reflection exercises. In total, 54 participants remained, 3 were men and 51 were women with a mean age of 48.63 years (SD = 7.85) ranging from 24 until 64 years of age. Almost 80% of the participants had a high educational level. Further demographic data is presented in Table 1. Per participant, the mean number of words (of all his/her reflections) were counted as well as the total amount of reflections, the participant wrote.

Table 1. *Demographics*

Characteristic	*n*	%	*M (SD)*
Mean age			
Total	54		48.63 (7.85)
Women	51		49.84 (7.95)
Men	3		46.00 (5.57)
Education			
Low/intermediate	11	20.4 %	
High	43	79.6 %	
Living situation			
Alone	8	14.8 %	

Together with partner and child(ren)	24	44.4 %
Together with partner without child(ren)	9	16.7 %
Alone with child(ren)	12	22.2 %
With parents	1	1.9 %
Work situation		
In paid employment	31	57.4 %
Self-employed	7	13.0 %
Unpaid work, volunteer	1	1.9 %
Unemployed	8	14.8 %
Unemployable	1	1.9 %
Retired	1	1.9 %
Housewife /-man	1	1.9 %
Other	4	7.4 %

Materials

Intervention

The gratitude intervention was an evidence based 6-week structured online intervention as used by Emmons & McCullough (2003). Every week on Sunday, the participants received an exercise aimed to enhance gratitude. Examples are: "*write three times per week 10 minutes about things of the day one is grateful for*" or, "*write a gratitude letter to someone*". In addition to the exercises, the participants received psycho-education about the working mechanisms and purposes of the exercise and some tips, how they could apply the exercises easily. On the following Saturday, participants received an e-mail with the instruction to reflect on the exercise and write down this reflection in their online happiness diary: "*This week, you did* [gratitude exercise]. *Write down what you have done. Write also down, what this activity means to you: How did you find it to do this activity? For example: What did you feel, what did you do, who was with you or for whom was it, what did it mean to you?*"

Table 2 provides a brief overview of the 6-week programme including the different exercises, the participants did. A more detailed overview about the intervention and instructions for the participants can be found in Appendix 1.

Table 2. *The 6-week programme of the gratitude intervention*

Week	Exercise
1	- **Diary of gratitude** - **Online happiness diary (*the reflection exercise*)**
2	- **Look through other eyes** - **Online happiness diary (*the reflection exercise*)**
3	- **Writing a gratitude letter** - **Online happiness diary (*the reflection exercise*)**
4	- **Worship the good in your life: Grateful memories** - **Online happiness diary (*the reflection exercise*)**
5	- **Gratitude and misfortune** - **Online Happiness diary (*the reflection exercise*)**
6	- **Establishing gratitude in everyday life** - **Online happiness diary (*the reflection exercise*)**

Quantitative Instruments

To assess mental well-being, the 14-item MHC-SF (Keyes, 2002) was used in the translated and validated Dutch version (Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). It has good psychometric properties and consists of three subscales: emotional well-being (3 items; $\alpha = .83$), social-well-being (5 items; $\alpha = .74$), psychological well-being (6 items; $\alpha = .83$) (Lamers et al., 2011). Participants were asked about the frequency of certain feelings in the past four weeks, ranging from *never* (0) until *(almost) always* (5). Example items are: "In the past month, how often did you feel…" …*Happy* (emotional well-being), … *that you had*

something important to contribute to society (social well-being) and … *that you liked most parts of your personality* (psychological well-being). For each of the subscales and the total scale, a mean score was calculated, ranging from 0-5. A higher mean score indicated a higher degree of well-being in total or in the related domain. In the current study, the MHC-SF reached the following alfa coefficients for inter-item reliability: emotional well-being (α = .82), social-well-being (α = .81), psychological well-being (α = .84).

To assess gratitude, the 16-item Short Gratitude, Resentment and Appreciation Test (SGRAT) (Watkins, Woodward, Stone, & Kolts, 2003) which is validated in Dutch language and has good psychometric properties (α = .88) (Jans-Beken, Lataster, Leontjevas, & Jacobs, 2015). It measures three characteristics of trait gratitude: perceived lack of deprivation, the tendency to appreciate simple pleasures and the tendency to appreciate the contribution of others to one's own well-being and the expression of this gratitude (Jans-Beken, Lataster, Leontjevas, & Jacobs, 2015; Watkins et al., 2003). An example item for this scale is: *"I am very grateful for what others did in my life."* All items could be answered on a 7-point Likert scale ranging from *strongly agree* (1) to *strongly disagree* (7). For the SGRAT, a mean score was calculated, ranging from 1-7. A higher mean score indicates a higher degree of gratitude. In the current study, the inter-item reliability was good (α = .87).

To assess positive and negative emotions, the modified Differential Emotions Scale (mDES) was included (Schaefer, Nils, Philippot, & Sanchez, 2010). It has satisfactory psychometric properties (α = .75) (Galanakis, Stalikas, Pezirkianidis, & Karakasidou, 2016) and measures positive emotions (8 items) and negative emotions (8 items) on two independent subscales. Participants were asked to evaluate to which degree they experience the indicated emotions at the moment, ranging from *not at all* (1) to *very intense* (7) on a 7-point Likert scale. Example items are: *joyful, amused, happy* (positive emotions) and *angry, irritated, mad* (negative emotions). Again, mean scores of both scales were calculated, ranging from 0-7. A higher mean score indicates a higher degree of experienced positive respectively negative

emotions. In the current study the inter-item reliability was satisfactory at both subscales: positive emotions (α = .64); negative emotions (α = .62).

Qualitative Instrument

The written reflections of the participants were analysed by making use of the REFLECT (Reflection Evaluation For Learners' Enhanced Competencies) Rubric (Wald et al., 2012). The REFLECT Rubric contains five criteria which are supposed to represent the whole picture of an elaborated reflection. For each of the five criteria (Writing Spectrum; Presence; Description of conflict or disorienting dilemma; attending to emotions, analysis and meaning making), scores were given from 0-3 for each of the criteria, indicating the different levels of reflection for (0= habitual action; 1= thoughtful action or introspection; 2= Reflection; 3= Critical reflection). Afterwards, an overall mean score of the reflection was calculated. Thus, a maximum total score of 3 could be reached, indicating the highest level of reflection. Table 3 provides an overview of the coding scheme as proposed by Wald et al. (2012).

Table 3. *The REFLECT Rubric Coding scheme*

Code	Writing Spectrum	Presence	Description of conflict or disorienting dilemma	Attending to emotions	Analysis and meaning making
0 = *Habitual action (nonreflective)*	Superficial descriptive writing approach (fact reporting, vague impressions) without reflection or introspection	Sense of writer being absent[*]	No description of the disorienting dilemma, conflict, challenge or issue of concern	Little or no recognition or attention to emotions	No analysis or meaning making
1 = *Thoughtful action or introspection*	Elaborated descriptive writing approach and impressions without reflection	Sense of writer being partially present	Absent or weak description of the disorienting dilemma, conflict, challenge or issue of concern	Recognition but no exploration or attention to emotions	Little or unclear analysis or meaning making
2 = *Reflection*	Movement beyond reporting or descriptive writing to reflecting (i.e. attempting to understand, question, or analyse the event)	Sense of writer being largely present	Description of the disorienting dilemma, conflict, challenge or issue of concern	Recognition, exploration, and attention to emotions	Some analysis and meaning making
3 = *Critical reflection*	Exploration and critique of assumptions, values, beliefs and the consequences of action (present and future)	Sense of writer being fully present	Full description of the disorienting dilemma, conflict, challenge or issue of concern that includes multiple perspectives, exploring alternative explanations, and challenging assumptions	Recognition, exploration, attention to emotions, and gain of emotional insight	Comprehensive analysis and meaning making

* Here, the coding scheme differs from the original as proposed by Wald et al. (2012), which made no differentiation between habitual action and thoughtful action or introspection and used the same coding for both.

Qualitative Analyses

Coding the reflections

Since the data was collected in the Netherlands, all reflections were written and analysed in Dutch language. The data was coded according to the REFLECT Rubric coding scheme from Wald et al. (2012). The codes were given for the whole text of the single reflection. The reflections were coded independently. In each text, the five dimensions were evaluated independently and received a score between 0 and 3, one after another in chronological order. Then, the means of all criteria per reflections were calculated. Afterwards, a mean score was calculated for every participant regarding all of his/her written reflections. Since only one researcher was responsible for the coding of the data, the interrater reliability could not be calculated. For a better understanding of how the scheme was applied on the reflections, two examples follow.

Examples from the data

These examples were translated into English. The original reflections in Dutch can be found in Appendix 2. The squared brackets indicate fragments of the text that were irrelevant for the analyses and thus left out in this paper. The first text is a reflection from week 4 and the second is a reflection from week 3. These examples were selected because of their good representativeness for a low-scoring reflection (1) and a high-scoring reflection (2).

1.

> *"The expression of gratitude helped me to make less considerations, react more from affect instead of thinking if something may, can be done, crazy or weird is. That gives so much space. It also goes easier. It seems that the genie is out of the bottle."*

This excerpt was coded as follows: *Writing Spectrum:* 1. The writing spectrum is very simple and short but still contains reflections and analysis over the own behaviour and the effects of the exercises *(make less considerations, react more from affect)*. The writer asks herself no

questions and gives vague explanations. The text is not coherent. *Presence:* 0. A sense of presence is absent; the writer gives no concrete examples of events and tells no story. *Conflict or Dilemma:* 0. The writer does not report any conflict or dilemma. *Attending to emotions:* 0. The writer does not pay any attention to emotions. *Meaning making:* 1. The writer makes little and unclear analysis and retrieves unclear meaning in the reflection *(goes easier, genie out of the bottle).* The total score of this reflection was thus 0.4 indicating that the participants' text was non-reflective.

2.

> *"Through this exercise I realize more and more that there are many things, I can be grateful for.* […] *I remain sensitive for relapses and doom thinking, but I do not fall so deep anymore.* […] *Through* [her husbands' behaviour] *a feeling of equality could grow and I learned that (for me) a relation can only exist when it is based on equality and reciprocal influenceability. That convinced me of that, with my actions and behaviour, I am co-responsible to let this relation be successful.* […] *The exercises from the past weeks, especially from this week,* […] *make me be more conscious about the value and speciality of certain moments. That makes that I can enjoy at THAT moment. When I came home yesterday evening after a hard day at school, where my self-confidence was challenged* […]

This excerpt was coded as follows: *Writing Spectrum:* 3. It was a very elaborated writing approach, consisting of many words and including the exploration of the own behaviour, an understanding of what happens *(doom thinking)* and consequences of action *(enjoy at THAT moment; success of relation).* It further contained explanations of today's situation derived from the past *(feeling of equality, co-responsibility)* and the exploration of her values and beliefs *(relation can only exist under certain circumstances). Presence:* 2. The sense of presence was high, the writer used examples *(When I came home yesterday evening). Conflict or Dilemma:* 2. The conflicts *(a hard day at school, doom thinking)* were described, but not explored from different perspectives. *Emotions:* 1. The writer recognised emotions, but no

further exploration of these was performed *(enjoy that moment). Meaning making:* 3. The writer makes a comprehensive analysis of the situation and retrieves meaning from the exercises *(make me be more conscious, enjoy THAT moment).* The total score of this reflection was thus 2.2, indicating that the participant reached the level "reflection" with her text.

Statistical Analyses

All statistical analyses were performed with IBM SPSS Statistics (24) and for all analyses, a significance level of .05 was handled. The difference scores for the outcome measures (well-being, including subscales; gratitude, positive and negative emotions) were calculated by subtracting the means of the pre-test from the means of the post-test (T1-T0). To evaluate statistical significance of the differences, paired-sample t-tests were applied. Pearson correlations were calculated between the difference scores of the outcome measures and the descriptive data of the reflections (mean number of words per participant and the amount of reflections). Further, Pearson correlations were calculated between the reflection scores (total score and single criteria scores) and the difference scores of the outcome measures. Correlation coefficients from .20 until .39 are regarded as weak correlations, coefficients from .40 until .59 are regarded as moderate correlations and coefficients from .60 until .79 are regarded as strong correlations. Finally, values above .79 are regarded as very strong.

Results

Descriptives

From the original 85 participants, 54 were included in the analyses, the drop-out rate was thus high with more than a third of the participants dropping out. 28 of the participants wrote all six reflections, 14 participants wrote five reflections, eight participants wrote four reflections

and four participants wrote three reflections. The reflections had a mean number of 119.58 words ($SD = 72.97$) and ranged from 11 to 383 words. The mean number per week varied from a minimum of 108.09 ($SD = 85.05$) (week 6) to a maximum of 128.22 ($SD = 102.14$) (week 5).

At the pre-test measurement (T0), the participants had an overall mean score of 2.64 ($SD = .74$) at the MHC-SF with subscale means of 2.86 ($SD = .84$) at emotional, 2.50 ($SD = .75$) at social and 2.66 ($SD = .80$) at psychological well-being. The baseline mean score for the SGRAT was 4.66 ($SD = .78$). For the mDES, participants had a mean baseline score of 3.79 ($SD = .91$) at positive emotions and 2.73 ($SD = 1.06$) at negative emotions.

The mean scores for the single criteria were as follows: *writing spectrum*: 1.48 ($SD = 0.54$), *sense of presence*: 0.77; ($SD = 0.52$), *dilemma*: 0.96 ($SD = 0.46$), *attending to emotions*: 0.96 ($SD = 0.52$), *meaning making*: 1.38 ($SD = 0.43$) resulting in an overall mean score of 1.11 ($SD = 0.37$) which indicates a mean reflective level between "thoughtful action or introspection" and "reflection" according to the REFLECT.

Effectiveness of the intervention

The results showed that the participants experienced significant improvements in all outcome measures (mental well-being and its' subscales, gratitude, positive and negative emotions. The mean difference scores ranged from 0.46 ($SD = 0.62$) at emotional well-being until .90 ($SD = .90$) at positive emotions.

Paired sample t-tests revealed that the differences between pre- and post-test measures were significant for all outcome measures at a .001 level with t- values ranging from -4.50 (negative emotions) until 8.11 (total well-being) (Table 4). These results indicate the positive effects of the intervention on mental well-being, gratitude and positive and negative emotions. H1 could thus be confirmed.

Table 4. *Means of pre- and post-test, difference scores and paired-samples t-tests*

Outcomes	Mean T0	Mean T1	Difference	*t*	df	*p*
Total well-being	2.64	3.17	.53	8.11	53	<.001
Emotional well-being	2.86	3.32	.46	5.50	53	<.001
Social well-being	2.49	3.00	.51	6.68	53	<.001
Psychological well-being	2.66	3.24	.58	7.65	53	<.001
Gratitude	4.66	5.21	.55	6.92	53	<.001
Positive emotions	3.78	4.69	.91	7.09	53	<.001
Negative emotions	2.73	2.00	-.73	-4.50	53	<.001

Correlations

Correlational analyses showed strong or very strong significant correlations between the different reflection criteria. Table 5 provides an overview. Almost all correlations between the mean scores of the single reflection criteria resulted to be positive and significant, apart from conflict or dilemma, which showed no significant correlation with either *attending to emotions* nor meaning making.

Regarding the correlations between the reflection criteria and the improvements of the outcome measures, only few and weak correlations were found (Table 5). Here, improvement in emotional well-being resulted to be the most important outcome, which is weakly but significantly correlated with the number of words, the total level of reflection, writing spectrum and sense of presence with correlation coefficients ranging from ($r = .29$) (overall level of reflection) until ($r = .34$) (number of words; sense of presence) ($p < .05$). These correlations indicate that participants who scored higher at the mentioned reflection criteria experienced slightly more improvements in emotional well-being.

Further, a significant weak correlation between *meaning making* and increase in positive emotions was found ($r = .32$; $p = .02$). In other words, participants, who had higher degrees of meaning making in their reflections were slightly more likely to experience more improvement in positive emotions. H2 was thus partly confirmed, only improvement in emotional well-being and positive emotions were associated with reflective depth.

Table 5. *Pearson correlations between the level and criteria of reflection, the outcome measures*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Level of reflection (total)	-														
2. Well-being (total)	.18	-													
3. Emotional well-being	.29*	.64**	-												
4. Social well-being	.11	.90**	.46**	-											
5. Psychological well-being	.12	.90**	.35**	.72**	-										
6. Gratitude	.09	.40**	.46**	.29*	.30*	-									
7. Positive emotions	.21	.32*	.27	.22	.30*	.31*	-								
8. Negative emotions	.03	-.27*	-.38**	-.13	-.23	-.43**	-.19	-							
9. Number of words	.80**	.13	.34*	.00	.07	.09	.06	-.05	-						
10. Number of reflections	.17	-.05	.04	-.14	-.01	.08	.22	-.01	.13	-					
11. Writing spectrum	.92**	.23	.31*	.15	.16	.11	.16	.07	.79**	.06	-				
12. Sense of Presence	.87**	.18	.34*	.07	.10	.13	.15	-.03	.90**	.14	.82**	-			
13 Conflict or Dilemma	.54**	-.03	.16	-.07	-.08	-.07	-.13	.23	.44**	-.04	.51**	.43**	-		
14. Attending to emotions	.76**	.10	.10	.06	.09	.01	.27	-.07	.43**	.22	.57**	.51**	.17	-	
15. Meaning making	.64**	.21	.15	.21	.17	.16	.32*	-.08	.39**	.26	.51**	.45**	-.10	.57**	-

The outcomes 2-8 relate to the difference scores

** Correlation is significant at the .01 level (2-tailed); * Correlation is significant at the .05 level (2-tailed)

Discussion

The results showed that the participants experienced improvement in mental well-being (emotional, social & psychological), gratitude as well as positive respectively negative emotions. Further, it was found that improvement in emotional well-being could be weakly associated with reflective depth, the writing spectrum and the sense of presence. Improvement in positive emotions could be weakly associated with the degree of meaning making in the reflections. No further correlations were found between improvement of the outcome measures and characteristics of reflective depth.

This study first aimed to investigate if the intervention led to positive changes regarding mental well-being, gratitude and positive and negative emotions. In line with the hypothesis, analyses revealed that the intervention did have the expected positive effects: Increase in emotional, social, psychological and total well-being, gratitude and positive emotions; decrease in negative emotions. This study has a within-group design without a control condition, the effects can thus not definitely be attributed to the intervention. However, as the intervention has already proven to be effective in previous experimental work (Emmons & McCullough, 2003), the results give an indication for its' effectiveness and are regarded as a replication of prior studies (Emmons & McCullough, 2003; Emmons & Stern, 2013). The results further indicate, that the used intervention is also effective in the Netherlands and in Dutch language.

The effects of gratitude interventions remain not fully understood and there is still much research necessary to understand how and why gratitude interventions work (Wood et al., 2010). Second aim of this study was to investigate whether and how the depth of reflections within a web-based gratitude intervention leads to more increase in mental well-being, gratitude and positive emotions as well as decrease in negative emotions. The hypothesis that reflective depth is related to the effectiveness of the intervention could partly

be confirmed. The analyses showed that improvement in emotional well-being was related to the overall level of reflections as well as to the criteria writing spectrum and sense of presence and mean length of the reflections. Meaning making was associated with an increase of positive emotions.

The result that all found correlations were weak is not surprising. The used gratitude intervention is six weeks long and daily stimulates the participants to work on themselves and to apply the exercises. In this relatively long time period with many different tasks, the reflections played a smaller role compared to the daily exercises. However, the results indicate that the reflections might have had their influence, though it was small. But as stated by different authors (Bolier et al., 2013; Huppert, 2009), even small effects on individuals can have a big impact on society, when many people are reached. It is noticeable that only emotion-related outcome measures (except from negative emotions) were associated with components of reflective depth, whereas all other outcome measures remained unaffected. For example, the sense of presence, which is regarded as an essential component of reflective engagement (Wald et al., 2012), revealed to be associated with an increase in emotional well-being. Texts with a high sense of presence are very detailed and written vividly (Wald et al., 2012). They give an indication for the writers attempt to mentally re-live the exercises and their consequences. Since the re-living of experiences can elicit the same emotions (Hamann, 2001), which are supposed to be positive, it is not surprising that a high sense of presence was associated with improvement in emotional well-being. The relation could also be vice-versa. Since emotional events are remembered better than neutral events (Hamann, 2001), successful exercises with more emotional consequences could provoke a higher sense of presence in the reflections.

The improvement in positive emotions and emotional well-being and their associations with reflective depth could also be explained by the notion that emotions play an important role in reflections who are regarded as an intellectual and affective activity (Boud, Keogh, &

Walker, 1985; Mann, Gordon, & Macleod, 2007). Mann et al. (2007) stress the importance of emotional elaboration while reflecting in order to achieve a deeper understanding of what is learned. This would explain why especially the emotion-related outcome measures were associated with reflective depth, supporting the notion that better "reflecters" elaborate more emotionally, that means that they experience stronger emotions while reflecting. An alternative explanation for the results that emotional well-being is related to reflective depth might be that the real underlying factor could be motivation towards the intervention. As commonly known, higher motivation of the patients leads to more success in therapy (Rosenbaum & Horowitz, 1983; Siegel & Fink, 1962; Sifneos, 1978) and it could be expected that higher motivated participants are also more motivated to write more elaborated reflections. However, since reflective abilities mirror someone's metacognitive skilfulness (Veenman & Alexander, 2011), it seems unrealistic that motivation would predict all variance in reflective depth. Since the sample in this study is relatively homogenous regarding the educational level, it might be questionable if metacognitive skilfulness is relevant at all, but research shows that the variance in reflective abilities is high, even in more homogenous contexts like among nursing students (Wald et al., 2012).

Research about the relation between reflective activity and well-being has shown that the effects of reflecting differ when comparing long-term and short-term effects. Whereas reflective activity can have neutral or even negative short-term consequences, on the long term, it leads to an increase in psychological well-being (Elliott & Coker, 2008; Pennebaker, 1990, 1993). This can further explain, why only few and small correlations were found. It can thus be expected that the participants who reflected more deeply, will experience improvement in psychological well-being on the long term. However, further research is necessary and highly recommended to investigate the possible long-term benefits of reflecting deeply within a positive psychological intervention.

The REFLECT Rubric in a gratitude intervention

The current study was the first study to measure reflective depth within a positive psychological self-help intervention. Therefore, the REFLECT Rubric was used. This tool was originally designed for teachers in educational settings to evaluate reflective abilities of nursing students on their learning progress and experiences in practical activities (Wald et al., 2012). So, the most striking difference between the reflection exercises between the original purpose of the tool and the current study was, that the participants in the current study wrote the exercises for themselves, (not for a teacher) and would not be evaluated on these. As a result, the reflections in the current study where shorter than the reflections in the study from Wald et al. (2012) whose example from the data contained approximately 800 words. The REFLECT Rubric was thus designed for longer and more elaborated texts than the texts which were used in the current study.

Though a floor-effect was found with a relatively low mean level of the total level of reflection, the criteria of the REFLECT Rubric fitted well on the requirements of the gratitude intervention. Just as in the original study of Wald et al. (2012), the participants were asked to make meaning of and interpret their experiences. They were also asked to elaborate their experiences emotionally. However, future research should focus on the development of a modified version of the REFLECT Rubric which accounts for the lengths of reflections within positive psychological interventions and the notion that the writers write the reflections for themselves instead of a specific target audience (teachers).

Strengths and Limitations

This study is the first to explore the specific role of reflections and reflective depth within a positive psychological intervention and can be regarded as a possible starting point for a new line of research. The used materials are well-known and have good or satisfactory psychometric qualities (Galanakis et al., 2016; Jans-Beken et al., 2015; Keyes, 2002; Lamers

et al., 2011; Schaefer et al., 2010) as well as the intervention, which has already proven to be effective (Emmons & McCullough, 2003). The pre-and post-test measurements allow precise evaluations of the effects of the intervention. Further, this study tested the suitability of a qualitative tool to evaluate reflections in psychological self-help interventions in a sample with a predominantly high educational level, which until now was only used in the context of the professional education of nursing students (Wald et al., 2012).

Unfortunately, this project was completed by only one person, so, no interrater reliability could be calculated for the qualitative analyses. For further work on the REFLECT Rubric in psychological interventions, it is thus strongly recommended to avoid this issue by working with a colleague or in a group.

Being a web-based intervention, this study is vulnerable to many uncontrollable factors in online environments like distractions at home or comprehension problems (Treiblmaier, 2011). However, the high accessibility for the participants and the high anonymity excel the disadvantages of online methods (Evans & Mathur, 2005). Unfortunately, the drop-out rate was relatively high and only few participants wrote all six possible reflections, which could have distorted the results. A further distortion might result from the fact, that the variance in total written words in the reflections was very high. Whereas some participants wrote very brief reports, others wrote very long and elaborated reflections. A reason for this high variance might be the relatively unclear request to reflect on the intervention exercises. Here, it would have been helpful to emphasize the importance of reflections and to provide some more hints about the elements a good reflection contains. By doing that, the participants could have been stimulated to "make the best" out of their possibilities. Another problem might have been the high number of scales, items and measurements which could have led to response fatigue of completing all the fields in the survey which in turn could bias the results of the questionnaires (Choi & Pak, 2005) or have led to less motivation to write long texts like it is expected for the reflections.

Implications

This study can provide a useful contribution for developers of positive psychological online interventions which still remain to have only small effect sizes (Bolier et al., 2013; Dickens, 2017) and thus have the potential to be further improved. The notion that participants who reflect deeper on their experiences in interventions experience more improvement in emotional well-being and positive emotions, can help to contribute to this potential improvement. The stimulation of deep-going reflections and the animation towards vivid writing approaches could thus improve the effect sizes of new or contribute to the revision of already existing interventions. Further, this study has shown, that the REFLECT Rubric is a tool, that can not only be used for reflections of students in health care systems (Wald et al., 2012), but is also a promising tool to evaluate reflections within positive psychological interventions.

Conclusion

The gratitude intervention revealed to be successful, the participants experienced positive changes in mental well-being, gratitude as well as positive and negative emotions. This exploratory study has led to new findings in an area of research that remained rarely targeted until now. A new tool for assessing reflective quality was used in order to evaluate participants' reflective abilities in an online gratitude intervention and relate them to the well-being outcomes of the intervention. Reflective depth was associated with improvement in emotional well-being and positive emotions. These findings can on the one hand contribute to a better understanding of how gratitude interventions work and on the other hand contribute to the development of more effective future gratitude interventions.

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Appendix 1

The six-week programme of the intervention

Week	Exercise
1	**Diary of gratitude**
	Write down every day (at least at 5 days) 3 good things of your day you are grateful about. Think about positive things that happened at that day. These do not necessarily have to be big things. It can be about someone who took the time to ask you how you feel, or someone who smiled at you or said something friendly to you, or a friendly stranger in the supermarket. But it can also be about aspects of your life, you are happy with.
	Here, it is important that you do not only write down the aspect precisely, but also write down why you are grateful for that. It is thus always about two questions:
	a. What happened precisely that makes you feel grateful? What are you grateful about?
	b. Why do you feel grateful: What does it mean to you?
	Online happiness diary (*the reflection exercise*)
	The task is to write every Saturday in your happiness diary what you are grateful about. Further, we ask you to write down what you think about the exercises from that week. We ask you to complete this task on Saturday, because on Sunday, you will receive instructions for the following week.
2	**Look through other eyes**
	This week, you write daily about one aspect of your everyday life. You can choose whatever you want. The exercise is, that you imagine that it does not exist anymore. It is

	interesting to choose things that you tend to regard as natural. We give you some examples: clean water from the tap, a pet, a loved one, the bike, the washing machine, your eyes, your legs, your teeth, an object that means a lot to you, a tree in front of your window, a panorama, flowers in your garden, the TV, sun protection etc. Write every day 10-15 minutes over one aspect and use the following questions: a. How would it be if that aspect was absent in your life? b. What does that aspect mean to you? c. What are you grateful about? **Online happiness diary** (*the reflection exercise*) See also week 1
3	**Writing a gratitude letter** Be aware every day of a person that did something good to you in the past weeks or months. Write a **gratitude letter** to that person. Describe as precise as possible what that person did (or does) for and what that means (or meant) to you. In other words, describe as precise as possible why you are grateful for that person. You can do this first in your diary. Do also something with your gratitude. This can happen in different ways. a. You can send an e-mail or a letter to that person in which you express your gratefulness. b. You can express your gratefulness when you meet that person. c. You can take the letter with you and read it out to that person. **Online happiness diary** (*the reflection exercise*) See also week 1.
4	**Worship the good in your life: Grateful memories** This week, take a couple of times the time to stand still at people, things or occurrences in your life you are grateful about. It can be about people that meant something good or positive to you.

	Write down every evening 15-30 minutes over people or aspects in your life you are grateful about. Describe as concrete and specific as possible what you are grateful about and what someone or something meant to you. If it is about people, you can also address these people directly. It can also be worthy to tell that person what you are grateful for. **Online happiness diary (*the reflection exercise*)** See also week 1.

5	**Gratitude and misfortune**
	
	The exercise of this week is to write about hard occurrences in your life. These might have happened long or short time ago. Take the time every evening (or at least 5 evenings) to write about one occurrence.
	
	Ask yourself the following questions:
	
	    a. Can I – retrospectively- see positive consequences of that occurrence?
	
	    b. Did I learn or discover something about life that I may be would not have learned otherwise?
	
	    c. Did I change as a human? What aspect of that change is positive?
	
	    d. Can I perceive gratitude for the positive consequences of that hard occurrence?
	
	Maybe, the answering of these questions can help you to (further) elaborate a hard occurrence.
	
	Online Happiness diary (*the reflection exercise*)
	
	See also week 2

6	**Establishing gratitude in everyday life** This exercise consists of two parts. The first part is to get your intention going and the second part is to get aware of possibilities to apply gratitude in your everyday life. a. Every morning, take 5 minutes of time to remind yourself about your intention to live your life with gratitude. Therefore, think about the following questions:

	- Stand still at the fact that you woke up. Can you be grateful for this?
	- How does the day look like?
	- Which activities will you do? With whom?
	- Plan to worship good and everyday things.
	- Think about how you will remind yourself today about your intention.
	b. During the day, stand still as often as possible at things you can worship, which are not natural and time-related.
	Online happiness diary (*the reflection exercise*)
	See also week 1.

Appendix 2

Example reflections from the data in Dutch language (Original)

1.

> *"Het uiten van dankbaarheid heeft me geholpen om minder afwegingen te maken, meer vanuit gevoel reageren ipv gaan bedenken of iets wel kan, mag, gek of raar is. Dat geeft zoveel ruimte. Het gaat ook gemakkelijker. Het lijkt alsof de geest uit de fles is..."*

2.

> *"Door het doen van deze oefening realiseer ik me meer en meer dat er veel is om dankbaar voor te zijn.* […] *Ik blijf gevoelig voor terugval en doemdenken, maar ik val niet meer zo diep.* […] *Daardoor* [gedrag van haar man] *is er bij mij een gevoel van gelijkwaardigheid kunnen groeien en heb ik geleerd dat een relatie alleen maar kan bestaan (voor mij) als deze gebaseerd is op gelijkwaardigheid en wederzijdse beïnvloedbaarheid. Dat heeft me ervan doordrongen dat ik met mijn acties en gedrag medeverantwoordelijkheid draag voor het slagen van onze relatie.* […] *De oefeningen van de afgelopen weken, en deze week in het bijzonder* […] *zorgen ervoor dat ik me meer bewust ben van de waarde en bijzonderheid van bepaalde momenten. Dat maakt dat ik op DAT moment kan genieten. Toen ik gisteravond thuiskwam na best een pittige dag op school, waar mijn gevoel van zelfvertrouwen behoorlijk getest was* […]*"*