

UNIVERSITEIT TWENTE.

The impact of a gratitude intervention on well-being: a randomized controlled trial

Faculty of Behavioural, Management and Social Sciences Study

Jennifer Hülsing

24.09.2018

Programme: MA Psychology

Specialization: Positive Psychology and Technology

Supervisors: Marion Sommers-Spijkerman, MSc

Dr. Matthijs Noordzij

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Abstract

Background: Although earlier studies have found positive effects of gratitude interventions on well-being, those interventions were mostly implemented in a student sample and put little emphasis on underlying working mechanisms. This study examines the effects of a gratitude self-help intervention on emotional, psychological, social and overall well-being, as well as the influence on gratitude, positive affect and positive relations in a general sample. Despite the efficacy, gratitude, positive affect and positive relations are examined as possible working mechanisms.

Methods: A non-clinical sample consisting of mostly higher educated Dutch women ($N=144$) was divided at random into a gratitude ($N=73$) and waitlist condition ($N=71$). Repeated measure analysis at post-test and follow-up were used to test the effect of the gratitude condition on well-being (MHC-SF), gratitude (GRAT-NL), positive affect (mDES), and positive relations (PGGS). To examine possible underlying working mechanisms, mediational analysis using PROCESS were performed with gratitude, positive affect and positive relations as mediators

Results. A significant difference between both conditions in case of emotional ($d=.54$), psychological ($d=.44$), social ($d=.66$) and overall well-being ($d=.60$), as well as on gratitude ($d=.67$) and positive affect ($d=.75$) at post-test was found, where participants scored higher on the measures in comparison to the waitlist group. The effects were maintained at follow-up, except for emotional well-being ($p=.054$). The treatment effect of the gratitude condition compared to the waitlist condition on well-being was mediated by changes in positive affect and gratitude. No significant difference between the conditions have been found for positive relations at post-test ($p=.531$) and follow-up ($p=.492$). The proposed mediational effect of positive relations has also not been found.

Conclusion. The implemented gratitude intervention showed promising effects on the sample to improve well-being, gratitude and positive affect. More insights into the working mechanisms behind gratitude and the implementation of the intervention in a different sample are still needed.

Introduction

With putting more and more emphasis on enhancing people's well-being instead of the mere reduction of negative symptoms of certain diseases in mental health care, new interventions are designed to achieve this goal. The effects of those interventions show different benefits for the individual and consequently society (Seligman & Csikszentmihalyi, 2000; Keyes, 2016). In the field of positive psychology, gratitude shows promising results in the enhancement of well-being (Diener & Chan, 2011), though it remains unclear how those effects are achieved (Wood, Froh, Gerghy (2009). The aim of the current study is to test the efficacy of a new gratitude intervention on enhancing well-being and get more insights into underlying working mechanisms.

Well-being

With the upcoming notion of positive psychology, well-being gained more attention within research. Positive psychology aims at changing the mere focus on the study and reduction of negative properties like mental illness to a more global view of mental health, including constructs like well-being and individual strengths (Seligman & Csikszentmihalyi 2000). More recent studies suggest, that mental well-being and mental illness are two related but independent dimensions of mental health, where mental illnesses are absent and the person experiences a high level of mental well-being (Keyes, 2016). This indicates that to effectively promote mental health in the individual, not only the reduction of mental illness should be the focus of interventions, but also the promotion of well-being.

Mental well-being consists of three different aspects, all adding up to overall mental wellbeing: emotional, psychological, and social well-being. Emotional well-being reflects the experience of positive emotions and general satisfaction in life. Psychological well-being includes self-acceptance, the feeling of being able to manage responsibilities of the daily life and personal growth. Social well-being on the other hand focus on functioning within a social

context, including the feeling of social integration, social acceptance and social contribution (Lamers, Westerhof, Bohlmeijer, Ten Klooster, & Keyes, 2010).

To enhance mental well-being has many positive effects: Diener and Chan (2011) reviewed different studies on well-being and indicate that enhanced well-being contributes to health and general longevity. Keyes (2016) states that people who experience signs of emotional well-being and functioning, are less likely to suffer from chronic diseases, and are less likely to develop mental illness. Furthermore, people scoring high on well-being report a good quality of life and having more meaningful relationships (Veenhoven, 2008). Besides the benefits for the individual, the inclusion of well-being in interventions leads to higher work-productivity, less days of absence at work, and reduced health care costs (Keyes & Grzywacz, 2005). To develop interventions directed at the enhancement of well-being has therefore individual and economical value.

Gratitude

The oxford dictionary defines gratitude as “the quality of being thankful; readiness to show appreciation for and to return kindness.” (Simpson & Weiner, 1989). Gratitude is differently used in psychological literature: as an emotion (see Fredrickson , 2005; Armenta, Fritz & Lyubomirsky, 2017) or as an affective trait (see Wood, Maltby, Stewart, Linley, Joseph, 2008; McCullough, Emmons, & Tsang, 2002) . The latter describes gratitude as a disposition that influences the tendency to react to other people’s acts and situations with grateful emotions, such as pride (Overwalle, Erviele & De Schuyter, 1995), trust (Laros & Steenkamp, 2005), or joy (Schimmack & Reizenheim, 1997). Besides these different approaches they both have in common that gratitude is in some way linked to the experience of positive emotions, either in being a positive emotion itself or by influencing the probability to experience them.

Efficacy of previous gratitude intervention

In a meta-analysis, Davis et al. (2016) summarized existing gratitude interventions under three categories, namely lists/journals about things people are grateful for, expressing gratitude to someone, and lastly psycho-educational interventions about gratitude. The first two are more common and have shown effects on emotional well-being, furthermore no differentiation in effect size has been found between both types of interventions. Another possible differentiation between gratitude interventions is the duration of it. Some interventions require the participant to focus on gratitude tasks for a longer time or perform them more frequently. Again, no difference in effect size can be found between the dose and duration of different interventions when comparing for minutes or days, according to Davis et al. (2016).

Previous studies implemented various interventions directed at gratitude: Emmons and McCullough (2003) performed different interventions in a student sample, namely a weekly ($N=192$) and a daily intervention ($N=152$) where people made a gratitude list. The authors measured a rise in emotional well-being. However, the effects were only measured at post-test, long-term influences of the interventions have not been measured. Additionally, only indications about emotional well-being has been made, whether the intervention affects overall, psychological and social well-being is not known. In another study, Froh, Kashdan, Ozimkowski and Miller (2009) implemented a high intensity intervention ($N=89$), where students had to write a letter showing their gratitude towards a person and finally presenting the person to the addressed person. Results show a positive effect of the intervention on emotional well-being. Geraghty (2010) implemented a gratitude list intervention and compared the intervention group with a measurement only group (total $N= 108$). Effects of the intervention on psychological well-being were found ($d=.54$). In another study, Toepfer et al. (2012) implemented a gratitude intervention, where the participants expressed gratitude in a letter, and compared the effects on psychological well-being with a measurement only group

(total $N=183$). A positive effect of the intervention on psychological well-being has been found ($d=.24$).

Different studies found effects of gratitude intervention on either emotional or psychological well-being, but were mostly implemented in a student sample. Furthermore, a broader measurement of overall well-being, emotional, psychological and social well-being is still missing. Additionally, have most studies only measured the effects during the intervention. To what extent results might change after the participants stopped with the intervention is not known. Lastly, did most studies not examine possible working mechanisms behind the found effects.

Working mechanisms

Different theories might give indications about the working mechanisms: firstly the moral affect theory (McCullough, Kilpatrick, Emmons, & Larson, 2001) puts emphasis on the social component behind the experience of gratitude and how it might positively influences social relationships. Another explanation is the positive affect hypothesis (Wood, Froh, & Gergathy, 2009): with gratitude being linked to a higher valence of positive emotions, the individual may benefit from the preventive quality of the frequent experience of positive emotions. Furthermore, may the habitual experience of positive emotions heighten the overall life satisfaction of the individual in long-term (Gallup, 1999).

Gratitude

With earlier gratitude interventions showing positive effects on well-being, a logical relationship should therefore be, that if those interventions are directed at gratitude, an enhancement of gratitude should explain the enhancement of well-being. Still, by comparing different studies Wood, Froh, Gergthy (2009) did not find any studies where gratitude was measured at the end of an implemented intervention. Statements about a possible mechanism of gratitude behind the enhanced well-being were therefore not possible yet. With examining

gratitude within this studies, more indications about the mechanisms behind gratitude interventions are possible.

Positive affect

Gratitude is linked to the experience of positive emotions: In different studies various emotions related to gratitude have been identified, for example: happiness, pride and hope (Overwalle, Ervielede & De Schuyter, 1995), admiration, respect, trust and regard (Laros & Steenkamp, 2005), or joy and contentment (Schimmack & Reizenheim, 1997). Touissaint and Friedman (2008) found a mediational effect on the association between gratitude and mental well-being, proposing positive affect being a possible working mechanism on the found observed effects of for gratitude on well-being.

An explanation why positive affect is associated with mental well-being has been made by Fredrickson & Joiner (2002). With the broaden-and-build theory, they argued that with each positive emotion a certain behaviour is promoted that builds up physical, psychological and social resources. Based on this theory, Fredrickson & Joiner (2002) furtherly discovered the possible effect of positive emotions on well-being. They proposed an upwards spiral of the experiencing of positive emotions towards an enhanced well-being, where positive emotions do not only influence the person positively in the present but also in the future. Applying this theory on gratitude a reason for its positive effects can be that stating ones gratefulness towards another person strengthens the emotional bond between both. The rewarding nature of strong social bonds will then benefit the wellbeing of the person in the future.

Several studies (see Wood, Froh & Geraghty, 2009) described a relationship between a gratitude intervention condition, positive affect and mental well-being, where they influenced each other positively. Based on earlier interventions positive affect has been proposed as a mediator between gratitude interventions and well-being (i.e. Friedman, 2008). However,

those interventions were implemented in a children sample or only examined direct effects after the intervention.

Positive relations

As mentioned before, are gratitude and social relationships two connected subjects. Many explanations behind the existence of gratitude touch the theme of social relationships and a functioning social life. Wood, Maltby, Gillett, Linley, & Joseph (2008) found that gratitude led directly to higher levels of perceived social support. Within interventions focussed on enhancing well-being by strengthening gratitude, a trend of a more positive perception of social relationships has also been found (Martínez-Martí, Avia, & Hernández-Lloreda, 2010).

This influence on social relations is also suggested by other authors: Michie (2009) found an association between gratitude and social means like pride, altruism, and social justice, Tsang (2006) linked gratitude with a heightened motivation to act prosocial, and generally an association between gratitude and positive relationships has been found in different studies (e.g. Wood, Joseph, and Matlby (2009); Wood, Maltby, Gilett et al. (2008); Froh, Yurkewicz, & Kashdan, 2009).

A possible explanation why we experience gratitude and how it leads to its associated positive effects is the moral affect theory (McCullough, Kilpatrick, Emmons, & Larson, 2001). Within this theory, gratitude has certain prosocial effects influenced by three moral functions of it. Firstly, gratitude can act as a *moral barometer*: the experience of the several positive emotions linked to gratitude gives the person the sign that he is in a positive situation or was the receptor of a kind act. Secondly, gratitude is explained as a *moral motive*. People are therefore more motivated to act more prosocial when they feel grateful. Therefore, if you feel thankful towards someone for his acts towards you, you are more likely to return the act or at least be less likely to act negatively towards the giver. Lastly, it can act a moral

reinforce, where the receiver of a prosocial act shows his gratefulness to the other person, which reinforces the person to, again, act prosocial towards the receiver. If a person experiences gratitude, or respectively positive emotions linked to gratitude, and expresses this in a “thank you”, the other person will feel validated for his act and repeat it in the future.

With social well-being, means like social functioning and social acceptance are determinants for well-being (Lamers, Westerhof, Bohlmeijer, Ten Klooster, & Keyes, 2010). Besides the theoretical explanations of gratitude in terms of social functioning, little is known about the effects of gratitude interventions on social relations and whether it serves as a possible mediator in the association between gratitude and mental well-being.

Current Research

The purpose of this study was to replicate earlier findings of gratitude interventions in a general population sample. The main research question was:

To what extent is the brief gratitude intervention effective in enhancing psychological, social, emotional and overall well-being, gratitude, positive affect and positive relations compared to a waitlist control condition?

It was hypothesized that participants in the intervention group score significantly higher on overall well-being emotional, social and/or psychological well-being, gratitude, positive affect and positive relations than participants in the waitlist control condition at post-test and/or six weeks after the intervention.

Little is known about the working mechanisms of gratitude interventions. As a secondary aim, this study examined positive affect, positive relations and gratitude as possible mediators of the effects of the intervention on well-being. The following secondary research question was formulated:

Can the possible effect of the intervention be explained by an enhancement of positive affect, positive relations and/or gratitude?

It was hypothesized that the effect of the gratitude intervention on overall well-being (at post-test) is mediated by changes in positive affect (two week measurement) (H2), positive relations (two week measurement) (H3), and/or gratitude during the intervention (difference between baseline and post-test).

Methods

Design

A single-blind randomized controlled intervention study has been employed, consisting of five different conditions. Within this study two conditions are compared, namely a gratitude and waitlist condition. A test battery was filled out by the participants at different moments: before the intervention at baseline (T0), two weeks (T1) and four weeks (T2) after the beginning of the intervention, a post-test measurement (T3) after the end of the intervention (six weeks after baseline), and a six week (T4) after the intervention follow-up measurement (see figure 1.). For this study the data of the T0, T2, T3 and T4 measurements are being used.

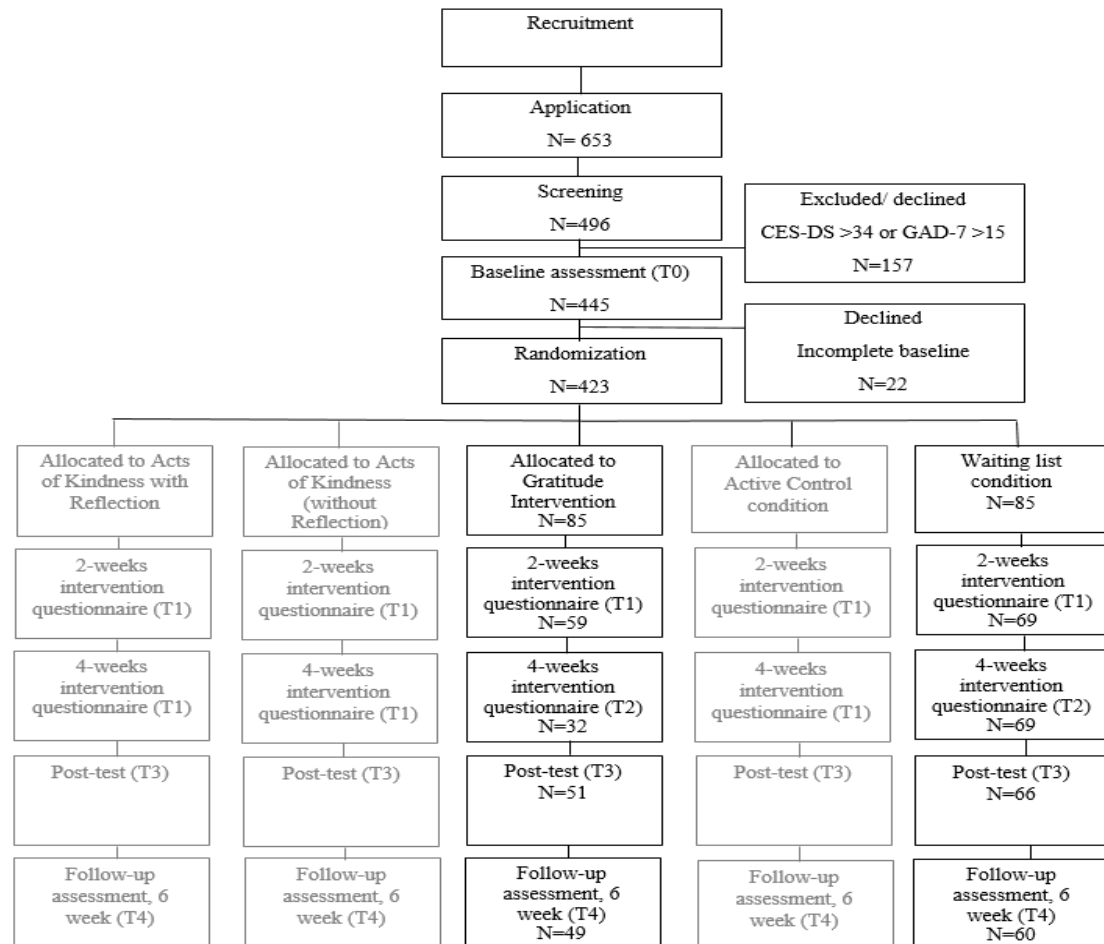


Figure 1. Procedure

Participants and Procedure

Participants were reached via advertisements in national daily newspapers (e.g. Volkskrant, Telegraaf) and the online newsletter of psychology magazines. To specifically reach persons who are generally interested in their own happiness, the advertisement included the question “do you want to experience more satisfaction and enduring happiness in your life”. Another part of the advertisement was a link to a website, to attain further information and finally sign themselves up for the study. A convenience sampling method has therefore been employed within this study. During the online registration process, participants had to give informed consent.

The target population within this study was the general public without high levels of well-being. Before officially participating in the study, the participants had to fulfil certain

inclusion criteria. For this matter, participants received a screening test battery, the participant has to be at least 18 years old, has an adequate understanding of the Dutch language and is able to write reflections in Dutch. The participants also have access to an internet connection, can be contacted via email and has to be willing to participate in the course of 6 weeks in the exercises of the intervention and to reflect on this experience the day after for approximately 10 minutes. Lastly, the participants have to accept the informed consent within the application process.

Participants were excluded for the further participation in case they fulfilled one or both of the following two criteria. Firstly, participants who fall in the category of “flourishers”, meaning that they (1) scored high (score of 4 or 5) on one or more items of the subscale “emotional well-being” of the Mental Health Continuum-Short Form (MHC-SF) and (2) scored high on six or more items of the combined subscales “social well-being” and “psychological well-being” of the MHC-SF. Secondly, participants were excluded when they showed moderate or serious symptoms of depression or anxiety, meaning that they scored 24 or higher on the Center for Epidemiological Studies Depression Scale (CES-D) and/or had a score of 15 or higher on the Generalized Anxiety Disorder 7 items (GAD-7).

If the interested person fulfilled the inclusion criteria, a randomization process took place dividing the sample to the conditions. Participants of all conditions started around the same time with their assigned intervention. After the end of the intervention the participants had to fill in again the test battery (T3), and six weeks after the end of the intervention (T4). After the screening the study included in total $N=144$ participants who were randomly assigned to the two conditions. The gratitude and waitlist condition included at the beginning $N= 85$ participants.

Outcome measures

For the current study, a battery of questionnaires was used including the Mental Health Continuum-Short Form (MHC-SF), the modified Differential Emotions Scale (mDES), the Gratitude Questionnaire-6 Dutch translation (GQ-6-NL), and the Positive Mental Health Scale (Positieve Geestelijke Gezondheid Schaal; PGGS).

Mental-Wellbeing.

To measure overall, emotional, psychological and social well-being, the Mental Health continuum-Short form (MHS-SF) developed by Keyes (2002b), has been used. The translated and validated Dutch version from Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes (2011) has been used. The participants is introduced to rate the statements on how often he or she experienced the described situation, the item_scores go from never (0) to nearly always (5), where a high score a higher level of wellbeing implies. Overall well-being, all scales combined, had an alpha ranging from .87 (T0) to .91 (T3). The subscale emotional well-being contains three items, e.g. “.. *that you are happy?*”. Lamers et al. reported a Cronbach’s Alpha of $\alpha=.83$, within this study the internal reliability is ranging from .78 (T0) to .91 (T3). The subscale psychological well-being contains 6 items, e.g. “.. *that your life has an direction and purpose?*”. Lamers et al. reported a Cronbachs alpha of $\alpha=.83$, within this study the internal reliability is ranging from .64 (T0) to .73 (T3). The subscale social well-being contains 5 items, e.g. “..*that you understand how our society works?*”. Lamers et al.(2011) reported a Cronbach’s alpha of $\alpha=.74$, within this study the internal reliability within this study is ranging from .77 (T0) to .85 (T3).

Gratitude

To measure gratitude the Short Gratitude, Resentment and Appreciation Test, Dutch translation (S-GRAT-NL) was used (Jans-Beken, Lataster, Leontjevas, & Jacobs, 2015). The questionnaire contains 16 items, e.g. “*Life has been good to me.*”. Participants had to indicate

in what extent they agree with the statement; the item scores go from “strongly disagree” (1) to “strongly agree” (7), where a high score implies a stronger experience of gratitude. The internal reliability in earlier studies was a Cronbach’s Alpha of $\alpha=.82$ (Jans-Beken, Lataster, Leontjevas, & Jacobs, 2015), in this study Cronbach’s alpha ranges from .84(T0) to .88(T3).]

Positive affect

To measure positive affect, the subscale of the modified Differential Emotional Scale (Schaefer, Nils, Sanchez, & Philippot, 2002) has been used. The subscale positive affect consists of eight items. The participants were asked in which extent they experience a certain emotion, e.g. “*satisfied, content, pleased*”; the item scores go from “not at all” (1) to “very intense” (7), where a higher score implies a stronger experience of positive emotions. Schaefer, Nils, Sanchez, & Philippot (2002) reported a Cronbach’s alpha of at least above $\alpha=.6$, within this the study the internal reliability is ranging from .51 (T0) to .91 (T4).

Positive relations

To measure positive relations the Positive Mental Health Scale (PGGS) was used. The questionnaire contains 9 items, e.g. “*I enjoy personal conversations with family members or friends.*”. The item scores range from 1 (disagree strongly) to 6 (agree strongly), where a high score implies more positive relations. Out of an earlier study (van Dierendonck, 2011), only the internal consistency for the whole questionnaire is known, where it ranges from .82 and .9, within this study the internal consistency for the used scale ranges from .49(T2) to .59 (T4).

Gratitude intervention condition

Within the gratitude condition, participants carried out six different exercise directed to influence gratitude each week including a short written reflection over the executed task over the course of six weeks (see Table 1). The intervention includes exercises involving gratitude lists and expressing gratitude towards another person. Within the reflection people were asked to state the task they performed and what this has meant for the person. Example questions were given for inspiration (e.g. “what did you feel?”, “what has it brought you?”).

Participants received each week an email with information about next week's tasks.

Participants were completely autonomous in acting out their tasks, being able to decide themselves when and where to do it.

Table 1. Gratitude exercises

Week	Exercise	Description
1	Gratitude journal	Write each day (or at least for five days) about three different things you are grateful for and describe why you are thankful for those things. Duration: 15 minutes/day
2	See with other eyes	Think about how your life would be different when a certain thing out of your daily life is no longer there. Write how this would change your life, what this aspect means for you, and what you are grateful for. Duration 10- 15 minutes/day
3	Expressing gratitude	Write each day about a person who did something nice for you. Describe as precisely as possible why you are grateful for that person. Afterwards, express your gratitude towards the person either via a letter, mail or personally.
4	Grateful memories	Write each evening about people or aspects in your life you are grateful for. Duration 15 – 30/day
5	Gratitude and drawbacks	Write each evening about a difficult situation in your life. Reflect about how this situation might have resulted in positive things, taught you something or made you grow as a person.
6	Gratitude as a life view	Think each morning about your intention to live a more grateful life. Reflect over the course as often as possible about moments you can be grateful about.

Waiting list control condition

Within this condition participants did not participate in an intervention directly. After the six weeks-follow up questionnaire (T3), they can choose for one of the four happiness interventions.

Data-Analysis

Analysis has been run with SPSS 22. First, means, standard deviations, and Cronbach's alpha have been computed to determine the internal consistency and to examine the scale structure of the mentioned measures. Further descriptives have been run to examine the sample's demographics and mean scores of the measurement outcomes at the baseline. Drop-outs were detected for the T3 and T4 assessment, with in total 40 cases (22.8%). Those case were removed before hypotheses testing by listwise deletion. To identify possible differences between drop-outs and completers, Chi-square and independent t-test were run for the

demographics and outcomes measures at baseline. Adherence was examined by an estimate of time spent for the exercise per week made by each participant, low adherence was judged in case a participant spent less than 15 minutes per week on the exercise, which is under the recommended time for the exercises. No exclusion of participants took place due to low adherence. To check whether randomization was successful between the gratitude and waitlist condition, Chi-square for the demographics and independent t-test for mean age and mean scores on the outcome measures have been run on both conditions at baseline. The data has been checked for normality with the Shapiro-Wilk-Test.

To test hypothesis one, the effects of the gratitude intervention on well-being, gratitude, positive affect and positive relations mixed ANOVA's have been run. With a 2 (condition) X 3 (time) design the mean scores of the MHC-SF, GRAT-NL at T0, T3, T4 and for the mDes and PGGS at T0, T2, T3, T4, the effects of the intervention were illustrated for each measurement moment. Significance was set at $p \leq .05$. The effect size given as Cohen's d , was calculated with the mean and standard deviation at each measurement moment, using the following formula: $d = \frac{\text{mean1} - \text{mean2}}{SD}$. Cohen's d was judged regarding to Cohen (1988) as following: $d \leq .2$ (small effect), $d \leq .5$ (medium effect), $d > .8$ (large effect). To examine whether the possible effects at post-assessment were maintained at follow-up effect was maintain, a one-way ANOVA was run with the measurement outcomes at post-assessment and follow-up as the dependent variable and condition as the factor.

To test hypotheses two to four a simple mediational analyses were conducted. With use of the PROCESS plug-in by Preacher and Hayes (2008) a mediational effect of positive affect, positive relations, and gratitude (M) on the association between the condition as the independent variable (X), and well-being as the dependent variable (Y), has been examined. See figure 2 for the proposed models. The models have been analysed separately. In each model the path c describes the direct effect of the independent variable *condition* (X: coded 1

for the gratitude intervention, 0 for the waitlist condition) on the dependent variable *well-being* (mean scores of the MHC-SF at T3). The *c'*-path represents the indirect effect of X on Y when controlling for the mediator *positive affect*, *positive relations* or *gratitude* (M: mean scores on mDES or PGGS at T1; difference scores on GRAT between T0 and T3). The a-path describes the direct effect of condition on the possible mediator (M: mean scores on mDES or PGGS at T1; difference scores on GRAT between T0 and T3). Similarly, the b path describes the direct effect of the possible mediator on the dependent variable (mean scores of the MHC-SF at T3). Significance was set at $p \leq .05$. The bias corrected (BC) 95% confidence intervals (CI) were estimated based on 5000 bootstrapping samples. When the CI of the indirect effect of X on Y did not include zero, the indirect effect was considered as significant.

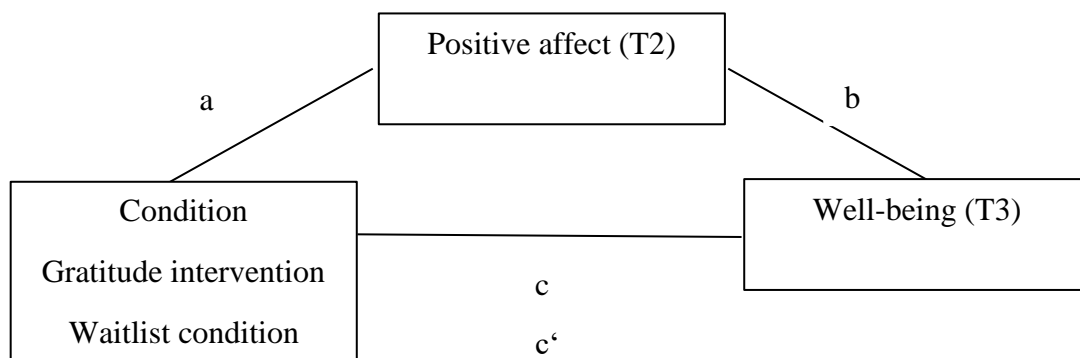


Figure 1. Proposed model 1.

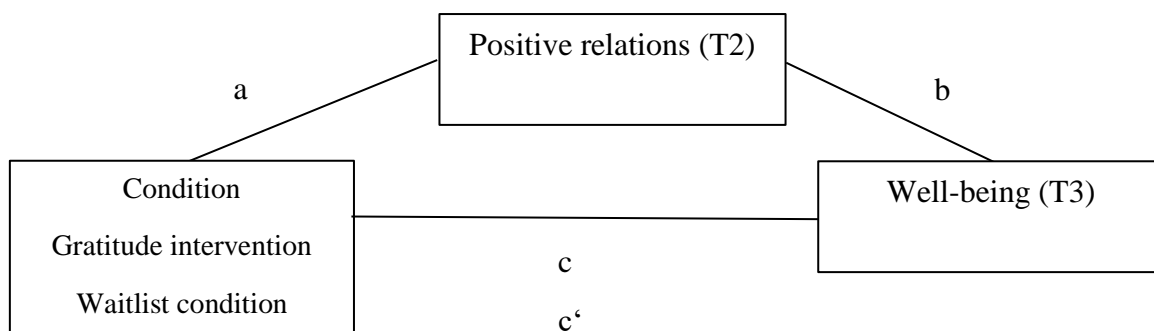


Figure 2. Proposed Model 2.

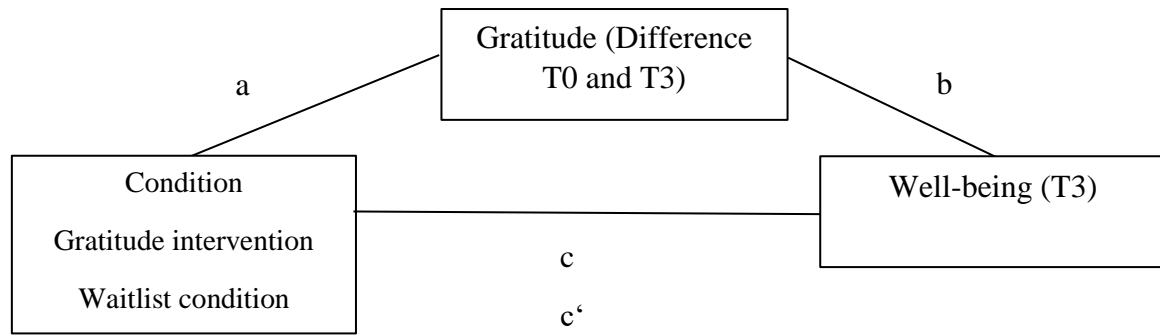


Figure 3. Proposed model 3

Results

Study sample

The whole sample was predominantly female (89.6%). Furthermore, has the high educational status of both samples to be noted (85.3%). The mean age of the sample is 46.68 years ($SD=9.51$). No significant difference between the gratitude and the waitlist condition has been found at the baseline level concerning the demographics (see Table 2). A significant difference was observed for psychological well-being ($p=.021$), where the waitlist condition scored higher on the measure than the participants of the gratitude condition. For the other outcome measures no significant difference was present at baseline.

THE IMPACT OF A GRATITUDE INTERVENTION ON WELL-BEING: A RANDOMIZED CONTROLLED TRIAL

Table 2.

Baseline characteristics (N=144).

	GI (N=73)	WLC (N= 71)	$\chi^2(df)$	<i>p</i>	<i>t(df)</i>	<i>p</i>
<i>Age, M (SD)</i>	47.38 (9.71)	50.01 (9.19)			-1.67 (142)	.097
<i>Gender, n (%)</i>			.05 (1)	.83		
Male	8 (11.00)	7 (9.90)				
Female	65 (89.00)	64 (90.10)				
<i>Nationality</i>			2.77 (2)	.25		
Dutch	69 (94.50)	69 (97.2)				
Other	4 (5.50)	2 (2.80)				
<i>Educational Level</i>			2.44 (4)	.66		
Low to middle Education	11 (15.00)	10 (14.10)				
Higher Education	62 (85.00)	61 (85.90)				
<i>Working Situation</i>			4.08 (8)	.85		
Paid	52 (56.20)	51 (57.70)				
Unpaid	21 (12.30)	20 (12.70)				
<i>Marital status</i>			1.13 (3)	.77		
Married /registered partnership	37(50.70)	35 (49.30)				
Not married	36 (20.50)	36 (21.10)				

THE IMPACT OF A GRATITUDE INTERVENTION ON WELL-BEING: A RANDOMIZED CONTROLLED TRIAL

Table 2 (continued).
Baseline characteristics (N=144).

	GI (N=73)	WLC (N= 71)	$\chi^2(df)$	<i>p</i>	<i>t(df)</i>	<i>p</i>
<i>Living Situation</i>			5.01 (5)	.41		
With partner	45 (17.80)	41 (28.20)				
Without partner	28 (38.40)	30(26.30)				
<i>Baseline scores</i>						
Overall well-being	2.45 (.09)	2.57 (.07)			-1.602 (142)	.111
Emotional well-being	2.68 (.75)	2.66 (.69)			-.055 (142)	.956
Social well-being	2.29 (.62)	2.37 (.63)			-1.21 (142)	.228
Psychological well-being	2.45 (.68)	2.69 (.61)			-2.33 (142)	.021
Gratitude	4.50 (.74)	4.50 (.77)			-0.32 (142)	.947
Positive affect	3.61 (.86)	3.54 (.67)			-.3 (142)	.741
Positive relations	3.86 (.52)	3.81 (.49)			.84 (142)	.400

Drop-out and adherence

28 cases of the gratitude condition and 12 in the control condition were reported as missing and excluded within the following analyses. Baseline differences were assessed between drop-outs and completers. A significant difference in mean age was found, where the drop-outs ($M=43.93$) were on average 6.59 years younger than the completers ($M=50.51$), ($t= 3.90$ (142), $p<.001$). Additionally, a significant difference in marital status has been found ($\chi^2=10.82(3)$, $p=.013$), where in the completers group more people were married ($N=56$) compared to the drop-out group ($N=16$). The vast majority of the participants of the intervention spent 30 to 60 minutes each week on the exercise (35.3%). Only five cases are reported (9.8%), where the participant spent less than 15 minutes per week on the intervention, which is under the recommended time.

Efficacy of the gratitude intervention

Table 2 displays the interaction effect between time and group for each outcome measure. There has been a significant interaction effect for emotional, psychological, social and overall well-being, as well as for gratitude and positive affect from T0 to T3, and from T0 to T4. This indicates the changes in the measurement outcomes over time were dependent on the condition. Additionally, the found effects are maintained from post-test to follow-up measurement. Effect sizes were medium, varying from $d=.40$ to $d=.75$. There has been no significant interaction effect between time and group in case of positive relations ($p=.958$).

There is a significant difference between both groups at T3 for emotional, psychological, social and overall well-being, as well as for gratitude and positive affect. The found effect was not maintained for emotional well-being at T4, no significant difference between both conditions is present ($p=.054$). In case of positive relations the groups did not differ significantly at T3 ($p=.543$) and T4 ($p=.497$).

THE IMPACT OF A GRATITUDE INTERVENTION ON WELL-BEING: A RANDOMIZED CONTROLLED TRIAL

Tabel 3. *Estimated means and effects of the gratitude intervention compared to the waitlist condition on emotional, social, psychological an overall well-being, as well as on gratitude, positive affect and positive relations at baseline (T0), interim measure (T2), post-assessment (T3) and follow-up (T4).*

		GI	WLC	Time*Group	
Outcomes	Time	<i>M (SD)</i>	<i>M (SD)</i>	<i>F</i>	<i>p</i>
Overall well-being					
	Baseline	2.45 (.61)	2.57 (.54)		
	T3	3.06 (.70)	2.66 (.64)	28.642	<.001
	T4	3.02 (.65)	2.72 (.68)	5.808	.004
Emotional well-being					
	Baseline	2.68 (.75)	2.67 (.64)		
	T3	3.22 (.80)	2.80 (.77)	7.990	.006
	T4	3.11 (.70)	2.81 (.82)	16.718	<.001
Social well-being					
	Baseline	2.30 (.62)	2.37 (.63)		
	T3	2.90 (.68)	2.45 (.68)	25.972	<.001
	T4	2.81 (.72=	2.54 (.65)	11.203	<.001
Psychological well-being					
	Baseline	2.45 (.68)	2.69 (.61)		
	T3	3.13 (.79)	2.80 (.71)	19.953	<.001
	T4	3.13 (.71)	2.84 (.72)	15.870	<.001
Gratitude					
	Baseline	4.51 (.76)	4.47 (.75)		
	T3	5.14 (.77)	4.62 (.78)	15.038	<.001
	T4	5.05 (.91)	4.56 (.74)	9.200	<.001
Positive affect					
	Baseline	3.61 (.86)	3.54 (.67)		
	T2	3.92 (.711)	3.54 (.72)		
	T3	4.62 (1.10)	3.84 (.99)	5.523	.005
	T4	4.53 (1.25)	3.91 (1.13)	4.097	.008
Positive relations					
	Baseline	3.87 (.52)	3.81 (.49)		
	T2	3.80 (.47)	3.67 (.53)		
	T3	3.81 (.47)	3.74 (.60)	.023	.971
	T4	3.72 (.49)	3.66 (.55)	.095	.958

Notes: GI= Gratitude intervention, WLC= Waitlist condition

Exploration of proposed working mechanisms

The results of all three mediational analyses are displayed in Table 4. Results indicate that the gratitude condition, as compared to the control condition, had a significant effect on overall-wellbeing at post-test(c-path). The gratitude condition was a significant predictor of positive affect and gratitude, in case of positive relations was it not a significant predictor ($p=.251$) (a-path). All three possible mediators were significant predictors of overall well-being (b-path). The indirect effects of positive affect and gratitude were in both cases significant, meaning they mediate the effect of the gratitude intervention on well-being. 28% of the variance of scores in well-being can be accounted for by the indirect effects of condition and positive effect ($R^2=.28$), in case of the indirect effects of condition and gratitude 7.5% of the variance in well-being can be explained by changes of both predictors ($R^2=.07$). In case of positive relations was the indirect effect not significant, 95% CI=-.0473, .2111.

Table 4. Outcomes of simple mediation analysis assessing indirect effects of positive affect (PA), positive relations (PR) and gratitude (G) on the outcome measure MHC-SF compared to both conditions^a

	c-path	c'path	a-path	b-path	Bootstrap results for indirect effects (95% CI)		
					ab	LL	UL
PA	-0.35*	.19	-0.37*	0.44*	0.08*	-.3381	-.0267
PR	-0.35*	-0.43*	-0.13	-0.58*	0.07	-.0473	.2111
G	-0.11*	-0.12	-0.45*	0.19*	-.04*	-.0884	-.0028

^aValues are unstandardized Betas; * Significant at $p < .05$

Discussion

This study was aimed to examine the efficacy of a six-week gratitude intervention on general, emotional, social, and psychological well-being as well as on positive affect and positive relations. A second aim was to get more insights into the working mechanisms of gratitude interventions by examining a possible meditational effect of positive affect, positive relations and gratitude on the association between gratitude interventions and well-being. The six week

long intervention was implemented in a Dutch general population sample, consisting mostly of higher educated women. The findings show a positive influence of the gratitude intervention on enhancing emotional, social, psychological and overall well-being, as well as positive affect and gratitude. Mediation analysis revealed positive affect and gratitude as mediators on the effect of the gratitude condition on overall well-being. Positive relations did not change significantly over the course of the intervention, and the expected mediational role of it was not proven.

Efficacy of the gratitude intervention

The gratitude intervention was primarily aimed at enhancing levels of well-being of the sample. According to the results, the participants scored significantly higher on emotional, psychological, social and overall well-being than participants of the waitlist condition at post-test. These findings support the hypothesis and are in line with earlier research, where different gratitude interventions have been implemented (Wood, Froh, & Geraghty, 2010). Especially emotional and psychological well-being showed a large effect size. Emotional well-being is among other given when a person experiences positive emotions (Lamers et al., 2010). By actively expressing something a person is grateful for, the person can take the most out of the positive life event (Sheldon & Lyumbomirsky, 2006). Participants might have therefore raised the impact of positive experience with help of the intervention, which led to higher scores in emotional well-being. Psychological well-being includes personal growth and the ability to cope with daily hazards (Lamers et al., 2010). Wood (2007) linked gratitude with positive coping styles: people who are grateful tend to use more positive coping mechanisms, like planning and finding potential for growth. The heightened likelihood to engage in adaptive coping styles might explain the effect on psychological well-being.

Next to well-being has the influence of the gratitude intervention on positive affect and positive relations been measured. According to the results did the participants of the

gratitude condition score significantly different over time compared to the control condition, and enhanced their experience of positive affect. Therefore, the hypothesis can be accepted, which goes along with earlier studies. Wood (2007) describes gratitude as being strongly related to the habitual experience of positive emotions. A rise of positive affect is therefore in line with theory. On the other hand, there has been no significant difference found between both groups on positive relations. The expected positive effect of the gratitude intervention on positive relations has not been found, the hypothesis is therefore not true. A possible explanation could be the used questionnaire, which mostly consists of items rather focussing on the amount of relationships than the value of those. Earlier studies described possible influences of gratitude interventions on the perception of relationships (e.g. Martínez-Martí, Avia, & Hernández-Lloreda, 2010; Froh, Yurkewicz, & Kashdan, 2009). A superficial assessment of the answers given of the participants in the gratitude condition, revealed many answers containing social and relationship subjects, e.g. valuing encounters with peers. Additionally, different theories on the positive effects of gratitude interventions are partly explained by social means, like more prosocial behaviour or seeking help of others more often (Wood, 2010). It seems therefore that gratitude is associated to effect the value of a relationship and help seeking behaviour and not a rise in the amount of relationships. An influence of the used measurement method might therefore be possible, since social well-being did change significantly over the course of the six week long intervention, compared to the waitlist condition.

Mediating role of positive affect and positive relations on well-being

Another aim of this study was to get more insights into the working mechanisms of gratitude interventions. One possible explanation was the effect of positive affect on the association between the gratitude intervention and well-being. The expected model has found to be true, where positive affect could explain the effects of the intervention on general well-being. As

stated before, gratitude being linked with the experience of more frequent positive emotions might explain this effect. Gallup (1999) suggested that a frequent experience of positive emotions may change the balance between positive and negative effect towards the former and in the end enhances well-being. Furthermore, was gratitude examined as a possible mediator. Results indicate that gratitude influences the association between participating in a gratitude intervention and enhanced well-being. In comparison to positive affect explains gratitude a smaller percentage of variance in well-being. With the results out of this study, it is indicated that not only outcomes associated with gratitude, like positive affect, are mechanisms behind well-being, but also gratitude itself. Though, it seems that constructs associated with gratitude play an important role on its positive influence on well-being.

In contrast, was the expected effect of positive relations on the association between the gratitude intervention and well-being not found. Davis et al. (2006) suggest in different explanation how a social component could explain the influence of gratitude on well-being, expecting it to be a working mechanisms behind it. Since positive relations did not differ significantly between both conditions, positive relations has not been found to be a mediator in the different well-being scores of both conditions. Again, a reason behind this could be the choice of the measurement instrument.

Strengths and Limitations

One of the main advantages of this study is the use of the MHC-SF which measures all three forms of well-being and overall well-being. Within gratitude research, most focus has been put on the effects of emotional well-being. This study used a more comprehensive measure of well-being, giving more insights into the effects of a gratitude intervention. Additionally, with its consideration of gratitude as an outcome measure, it is one of the few studies examining effects on gratitude and being able to make conclusions about gratitude as a possible

mediator. Another strength of the study is the high adherence of the participants with close to 90% of the participants spending the requested amount of time on the exercises or even more.

Besides its strengths, this study also contains some limitations. Firstly, the used sampling method attracted mostly middle-aged high educated women, which is not a representative sample. Therefore, the findings are not generalizable to the general public. A second limitation is the reliance on self-reporting measurements within this study. It might be possible that the social desirability of high well-being might have influenced the answers of the participants to higher ratings. Thirdly, due to the use of a waitlist control condition, might it be possible that changes in the outcomes have been simply due to engaging in an activity involving self-discipline (Davis et al., 2016). To compare the effects of the gratitude condition with another active control condition might have given smaller effect sizes (Cunningham, Kypri, & McCambridge, 2013). Thus, an overestimation of the actual effect sizes of this study might be possible. Lastly, has there been no supervision of treatment integrity, it can therefore not be excluded that the found effects might not be due to the intervention. If participants followed the instructions precisely has not been checked.

Implication and future research

This study revealed that the implemented gratitude intervention was able to enhance levels of emotional, psychological, social and overall well-being, as well as positive affect and gratitude. With a raising interest in the enhancement of well-being in the general public, this study gives important insights.

Lambert et al. (2010) proposes that the full effects of gratitude are only reached by actively expressing one's gratitude. To ensure that the participant benefits the most from the intervention moments of expressions could be risen and controlled more. By letting the participants reflect about the moment of stating one's gratitude towards another person, the

experience can on the first hand become more insightful for the participant and, on the other hand, control for the actual engagement of the participant in such an act.

Since the sample consisted mostly of highly educated women, it would be interesting to implement the intervention in a different sample. Whereas not only a more generalizable sample would be from interest, the effects on a clinical sample should also be examined in the future (see Davis et al., 2016; Wood, Froh & Geraghty, 2010). Within this study, the participants already scored high at baseline on measures of well-being, gratitude, positive affect and positive relations. A sample with lower levels might show different outcomes. It would be also interesting to examine the effects of the intervention on the other dimension of mental health, namely mental diseases, to see whether this intervention affects both dimensions of mental health.

One of the main advantages of this study is the consideration of possible working mechanisms. This study gave insights about the positive role of positive affect and gratitude on the efficacy of gratitude interventions. Still, there are other different possible working mechanisms: studies revealed an association between gratitude and different personality traits like the Big five personality traits (Wood, Maltby, Stewart & Joseph, 2008; Wood, Joseph & Maltby, 2009). Conducting moderation analysis on those traits might reveal whether people with certain traits might benefit more of a gratitude intervention.

Conclusion

With the present study a few gaps within the gratitude research could be filled. Effects have been found of the gratitude intervention combining different gratitude exercises. The findings yield evidence for the importance of positive affect as a working mechanism behind the positive effects of gratitude interventions, but also showed that those are explained by gratitude itself. Nevertheless is there still need for more research to examine the effects in different samples and to use different measures to possibly replicate the findings of this study.

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