

# UNIVERSITY OF TWENTE.

Faculty of Behavioural Sciences Psychology

## **The Mediating Effect of Positive Emotions on the Relationship Between Acts of Kindness exercises and mental mental well-being :**

A Randomized Controlled Trial

**Master Thesis**

Karin Robah

S1462369

**1<sup>st</sup> Supervisor**

Dr. Marijke Schotanus-Dijkstra

**2<sup>nd</sup> Supervisor**

Jannis Kraiss

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# THE MEDIATING EFFECT OF POSITIVE EMOTIONS

## Abstract

Research showed that positive psychological interventions like acts of kindness enhance mental well-being, due to increased positive emotions. However, no study has investigated the function of specific positive emotions on mental well-being, nor which specific positive emotions are enhanced by acts of kindness interventions. Therefore, the present study examined the role of 8 (interested, moved, cheerful, joyful, satisfied, surprised, loving, calm) specific positive emotions on the relationship between six-week acts of kindness interventions and mental well-being. The study sample was composed of 253 participants from the general Dutch population (*mean age* = 48; *SD* = 9.82), randomly assigned to the experimental condition (*n* = 169) or waitlist-condition (*n* = 84). Participants in the acts of kindness condition were instructed to perform five acts of kindness on one day during one week on another person, while participants in the waitlist-condition received the intervention exercise after the six weeks follow-up questionnaire. Levels of mental well-being and emotional states were assessed by self-reporting questionnaires at baseline, during the intervention and 6 weeks after baseline.

MANOVAS revealed a significant effect of performing kindness acts on mental well-being in the acts of kindness condition, compared to the waitlist-condition. Further results of the MANOVAS revealed that the majority of positive emotions were not significantly enhanced at post-test in the intervention condition compared to the waitlist-condition. However, results revealed that pro-social behaviour significantly enhanced feeling interested at post-test in the acts of kindness condition compared to the waitlist-condition. Moreover, results revealed that the majority of positive emotions did significantly enhance mental well-being at post-test. Most important, results of the mediation analyses revealed that feeling cheerful was a significant mediator between pro-social behaviour and mental well-being. Therefore, the results of the current study fill in the gap in existing literature by revealing one specific significant mediator between acts of kindness and mental well-being. However, further exploration of positive emotions is still needed on other interventions that might promote mental well-being, since not all positive psychological interventions work the same.

## Introduction

### Positive emotions

In the past, the traditional research community of psychology has long neglected the subject of positive emotions. Until the 1980s, the focus of traditional clinical psychology was on reducing negative emotions rather than on enhancing positive emotions (Seligman & Csikszentmihalyi, 2000). Especially evolution scientists express their concern that an inappropriate response to life-threatening experiences could cause the death of an individual, whereas a failure to respond to a life opportunity is unlikely to result in such fatal consequences (Pratto & John, 1991). According to these strong opinions, the focus on negative emotions seemed therefore, for a while, to be more detrimental for human development and survival (Pratto & John, 1991). However, the emergence of positive psychology studies throughout the years increased the relevance of investigating also positive emotions. Looking at the definition of the term, Fredrickson (2013) described emotions as “brief, multisystem responses to some change in the way people interpret or appraise their current circumstances” (p.3). If individuals appraise these current circumstances as extraordinary good, positive emotions emerge. Following studies on the role of positive emotions resulted in knowledge about several beneficial effects, like the buffering mechanism against stress and increased social connectedness (Garland et al., 2010), the association with creative thinking and attention broadening (Fredrickson & Branigan, 2005) and resource development and resilience (Fredrickson, 1998, Fredrickson & Kurtz, 2011). Further studies identified a significant positive relationship between positive emotions and the improvement of immune functions (Markland, Pressman, & Cohen, 2006). Other studies like Tugade and Fredrickson (2004) identified positive emotions as fundamental mechanisms for facilitating cardiovascular recovery from negative emotions.

Fredrickson (2001,1998) further emphasized the need to focus on positive emotions by identifying ten most common positive emotions (joy, gratitude, serenity, interest, hope, pride, amusement, inspiration, awe and love) as major contributors for resource development and mental well-being in the sense of the broaden and build theory of positive emotions (Fredrickson, 2001, 1998). The broaden and build theory is based on the assumption that positive emotions lead to improved mental well-being by supporting individuals to develop resources over time through broadening their behavioural action repertoires. The so-called broadening effect, triggered by positive emotions leads the individual to obtain and build

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personal resources like physical skills, friendships, supportive social environments, expert knowledge and optimism, related to specific emotions (Fredrickson & Losada, 2013; Fredrickson & Branigan, 2005, Rowe, Hirsch, & Anderson, 2005). These acquired resources can be further stored as reserves which can be used throughout life, improving individuals coping and survival as supported by a recent study of elderly nuns by Danner and colleagues (2001).

Howell Frederickson's broaden and build theory emphasizes significant positive effects of positive emotions on resource development and mental well-being, she further emphasizes the need to distinguish between different positive emotions. Since not all positive emotions are related to the same behavioural-action-repertoires, resulting in different personal resources (Fredrickson, 1998).

For instance, the positive emotion joy is assumed to broaden the individual's thought-action-repertoire by the urge to play, leading to the development of social resources, while the emotion interest broadens the individual's momentary thought-action-repertoire by creating the urge to explore, discover and experience new possibilities and information in order to extend self-growth (Csikszentmihalyi, 1990, Izard, 1977, Silvia, 2001).

Although Frederickson (1998) discriminates between different positive emotions related to different resource development; the full picture of the function of positive emotions is not covered, since several researchers identified that not all positive emotions yield positive outcomes in general (Watson & Naragon-Gainey, 2010, Gruber et al., 2017; Shiota et al., 2017, Vazquez, 2017). While Watkins, Emmons, Greaves, and Bell (2017) identified feeling joyful to be a significant predictor of mental well-being since emotional states like excitement and joy are assumed to have an additional effect on attention broadening. Gruber et al. (2017) identified higher level feeling joyful to be strongly associated with symptoms of mania in an adult sample. Further, feeling loved seems to reflect the most supreme and essential emotional experiences for thriving and health, leading to the development of social support resources (Frederickson, 2013). Other researchers identified higher level of perceived love facilitate the vulnerability to depressive symptomatology in an adult sample, because feeling loved might shift into frustration and feeling hurt, when idealized romantic convictions are not satisfied, especially in romantic relationships (Welsh, Grello, Harper & Dickson, 2003, Stroud, Davila & Moyer, 2008).

Based on these contradicting findings on the effects of positive emotions, the importance lays on finding out which specific positive emotions are responsible for mental well-being, since

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not all positive emotions reflect a desired positive outcome. Positive emotions reflect an important component of mental well-being since mental well-being reflects a multidimensional construct composed of three key elements including emotional well-being. Emotional well-being is composed of emotion related components including the perception of affective states and perceived life satisfaction. More precisely, emotional well-being is described as not only the presence of positive emotions but likewise the absence of negative emotions (Keyes, 2002). Another key element of mental well-being reflects psychological well-being (Ryff, 1989). Psychological well-being can be described as optimal human functioning including the perception of autonomy, self-acceptance, environmental mastery, positive relations, personal growth and purpose in life (Ryff, 1989, Diener, 1984, Ryff, 1995). Lastly according to Keyes (1998) social well-being reflects another important component of mental well-being. Social well-being is stated as optimal social functioning, including, social acceptance, social integration, and coherence.

Keyes (2002, 2004, 2005, 2007) himself further emphasizes the importance to promote mental well-being and stated many times that higher levels of mental well-being seem to act as a buffering mechanism against mental illnesses like depression and further reduces the risk of cardiovascular diseases, physical illnesses and numbers of absent days at work. A study of a representative Dutch sample by Schotanus-Dijkstra and colleagues (2016) built upon Keyes findings and identified further a significant negative association between mental well-being and mental illnesses by revealing that a higher level of mental well-being reduces the risk of mood disorders by 28% and anxiety disorders by even 53% (Schotanus-Dijkstra, ten Have, Lamers, de Graaf & Bohlmeijer, 2016). Since literature emphasizes the positive effects of mental well-being for illness prevention and reduction, the importance, therefore lies in the investigation of how mental well-being might be promoted. By this, several studies revealed positive psychological interventions (PPI) as major contributors for enhancing mental well-being (Keyes, 2007, Huppert, 2005, Cohn & Fredrickson, 2009).

### **Positive psychological interventions**

During the last decades, a new strength and mental well-being focused discipline, named Positive Psychology (Seligman & Csikszentmihayi, 2000), arose. This approach investigates the factors responsible that might promote happiness and resilience by the use of positive psychological interventions (PPIs) defined by Sin and Lyubomirsky (2009) as “treatment

methods or intentional activities that aim to cultivate positive feelings, behaviours, or cognitions” (p.468). However, Bolier et al. (2013) takes a step further and defines PPI’s as strictly based on positive psychological theories that promote mental well-being.

Several studies revealed different PPIs, like acts of kindness as helpful therapeutic tools enhancing mental well-being and preventing psychopathology like depression and anxiety disorders (Keyes, 2007; Huppert, 2005, Cohn & Fredrickson, 2009, Nelson, Porta, Bao, Lee, Choi & Lyubomirsky, 2015, Nelson et.al, 2016). Acts of kindness is pro-social behaviour conducted towards another person to benefit them like e.g. bringing food to the elderly. Several studies revealed, acts of kindness as a useful tool for promoting mental well-being, since expressed kindness towards others is identified as a contributor for promoting compassion, empathy, interconnectedness with others and mental well-being (Nelson, Layous, Cole & Lyubomirsky, 2016, Nelson, Porta, Bao, Lee, Choi & Lyubomirsky, 2015). Nelson (2016) further argues that acts of kindness promote mental well-being due to the experience of positive emotional states like love, compassion, trust, and closeness with others (Nelson, Layous, Cole & Lyubomirsky, 2016).

Indeed, many studies revealed the effectiveness of acts of kindness interventions on mental well-being, less is still known about the specific mechanisms and processes, through which acts of kindness interventions achieve improved mental well-being in particular (Schueller & Parks, 2014, Lyubomirsky & Layous, 2013, Nelson et al., 2016).

### **The present study**

Conclusively, literature revealed a positive relationship between positive emotions and well-being. Although it becomes clear that a detailed understanding of the functions of specific positive emotions is still missing since not all positive emotions might result in positive outcomes. Further, to the author’s knowledge, no study has investigated which specific positive emotions might be enhanced when performing acts of kindness, nor which specific positive emotions might mediate the relationship between acts of kindness interventions and mental well-being. Therefore, this paper is going to bridge the gap in the current research by investigating specific positive emotions as potential mechanisms between acts of kindness interventions and mental well-being. In terms of six-week acts of kindness intervention, the role of the following eight specific positive emotions in the enhancement of mental well-being are investigated:

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interested, moved, cheerful, joyful, satisfied, surprised, loving, calm. Based on the literature findings, it is expected that

- (1) the six-week acts of kindness intervention is significantly more effective in the improvement of mental well-being compared to the waitlist-condition at post-test.
- (2) the six-week acts of kindness intervention is significantly more effective in enhancing all eight positive emotions compared to the waitlist condition
- (3) all eight positive emotions during the intervention lead to a significant improvement of mental well-being in the acts of kindness intervention compared to waitlist condition at post-test and
- (4) an increased level of all 8 positive emotions during the intervention are associated with higher-level mental well-being in the acts of kindness condition compared to the waitlist-condition at post-test.

### Methods

#### Study Design

The Flowchart of the study design is depicted in Figure 1. The current study reflects a research part of a larger five armed randomized controlled trial investigating the effectiveness of different positive psychological interventions like acts of kindness on mental well-being. This five-armed trial was conducted for 7.5 months in total, from September 2017 to May 2018. The experimental conditions were composed of the following two groups: acts of kindness intervention without reflection and acts of kindness intervention with reflection, by which participants further reflected in an online journal on their experience. For the current study, the two experimental conditions were merged into one experiential condition. The current study is therefore, going to focus on the merged experimental condition and the waitlist control condition. After the screening procedure was completed, questionnaires were occupied at baseline (T0) before the start of the intervention. During 2-weeks (T1) and 4-weeks (T2) of the intervention, a short questionnaire was conducted to examine the mediating effects of positive emotions. Lastly, a post-test was assessed 6-weeks after baseline (T3).



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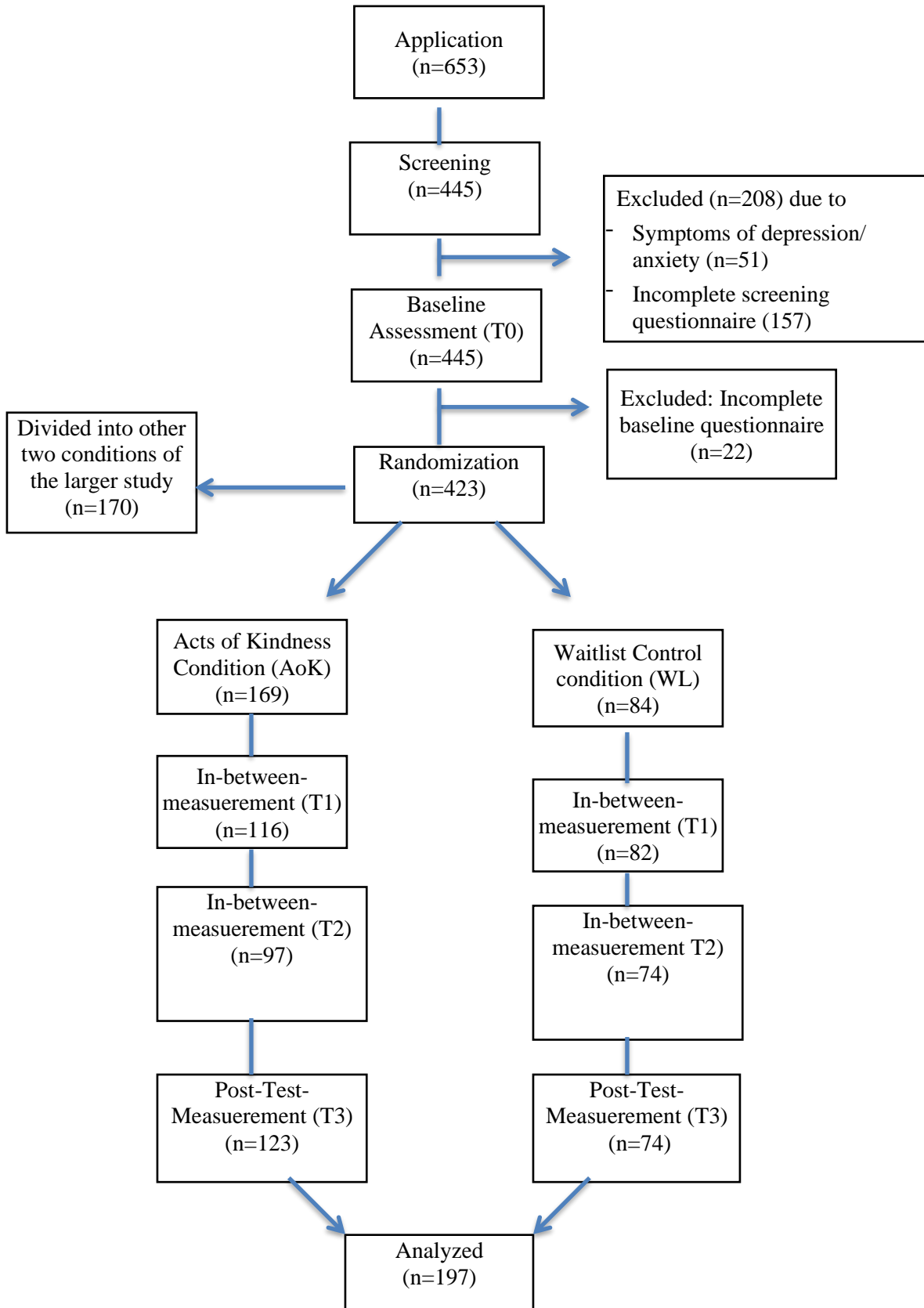


Figure 1. Flowchart of the study design.

### **Participants and Procedures**

The current study was conducted at the University of Twente, from the Department of Psychology, Health and Technology in the Netherlands and approved by the ethical commission of the Faculty of Behavioral, Management and Social sciences of the University of Twente (BMS). The data was acquired via the online survey platform *Qualtrics*. The approach of the respondents was conducted via advertisements in regional and national newspapers (Tubantia, Volkskrant, Gelderlander), online newsletter Psychology Magazine and via Facebook advertisement. After successfully filling in the registration form, participants received an e-mail within 5 business days after registration with the information about the right to withdraw from the research study without prior notice. This e-mail entailed an invitation link to the online informed consent procedure and a short screening questionnaire to determine the suitability of the participants for the current study. After online application ( $n = 653$ ), inclusion criteria for participating in this study were composed of a minimum age of 18 years, and the experience of a low or moderate level of mental well-being as measured with the Mental Health Continuum-Short Form (MHC-SF). Furthermore, a sufficient internet connection, an e-mail address and sufficient mastery in the Dutch language to fill in the questionnaires and follow the self-help intervention independently were mandatory criteria. Participants were excluded from the study on the presence of serious depressive or anxiety symptoms: score of  $>34$  on the Center for Epidemiological Studies Depression Scale (CES-D) and/or score of  $>15$  on the anxiety scale (GAD-7). After the screening procedure was finalized ( $n=653$ ), 423 suitable participants completed the baseline questionnaire in September 2017. A stratified randomization procedure was then conducted via randomizer.org to allocate these 423 participants with an even distribution of men/women, lower/higher educated and low mental well-being /high mental well-being to one of the five conditional groups. After randomization, the final sample for the acts of kindness condition and the waitlist-control condition consisted of 253 participants.

### **Conditions**

*Acts of kindness condition.* Participants were instructed to engage in friendly acts towards others like carrying groceries for the neighbours or cooking for the family. For this purpose, participants received e-mail every Sunday, including the instructions of the intervention. Participants were instructed to perform five acts of kindness on one day, one time per week, for

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six weeks. Participants were further asked to fill in an online happiness journal on the following day but no later than Saturday, describing what they did and for whom. Further, one or two reminders were sent via e-mail during the week to reinforce participants' adherence.

***Waitlist-control condition.*** Participants were instructed to choose the happiness exercises they preferred to conduct, like carrying groceries for the neighbours or cooking for the family, but only after some fluctuations in their level of happiness were collected. Participants therefore, received the happiness exercises after the six weeks follow-up questionnaire. However, during this study, participants filled in the questionnaires as appropriate to the other conditions.

### Measures

***Positive Emotions.*** In order to examine the 8 specific positive emotions, a modified Dutch version of the Differential Emotion Scale (mDES) was used (Fredrickson, 2013, Schaefer, Nils, Sanchez, & Philippot, 2010). Participants could evaluate their experienced emotions in the past two weeks by responding on a seven-point scale ranging from 1 (*not at all*) to 7 (*very intense*). Higher total mean scores indicate higher level of positive emotional states. A reliability analysis by Schaefer et., al. 2010 approved a good internal consistency of the psychometric test by examine a Cronbach's alpha greater than .601, corroborated by a Cronbach's alpha of .59 of the current study.

***Mental well-being .*** The Dutch version of the Mental Health Continuum Short Form (MHC-SF) (Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2011, Keyes, 2002) was used to examine mental well-being . This scale is composed of 14 items and three subscales: emotional mental well-being (3 items), psychological mental well-being (6 items) and social mental well-being (5 items). Participants can evaluate on their experienced mental well-being in the past month by responding on a six-point Likert scale ranging from 0 (*never*) to 5 (*almost always*) with total mean scores ranging from 0 to 5. Higher mean scores indicate higher levels of mental well-being ., the Dutch version of the MHC-SF displayed good psychometric qualities (Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). Reliability analysis of the MHC-SF in the current study showed .89.

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### Data Analysis

The significance of all analyses was set at  $p < .05$ . Statistical analyses were conducted with IBM SPSS Statistics Software (version 22.0). In order to examine equality of the groups in demographics and outcome measures at baseline between the conditions, chi-square tests and independent samples t-tests were conducted. Also, Pearson correlations between mental well-being and each positive emotion at baseline was computed. As suggested by Evans (1996) values of .00-.19 are considered as “very weak”, .20-.39 as “weak”, .40-.59 as “moderate”, .60-.79 “strong” and .80-1.0 as “very strong” correlation.

To examine if mental well-being was significantly more enhanced by performing acts of kindness compared to the waitlist control condition, MANOVA was conducted with the mean score of mental well-being at post-test (T3). Further to examine if positive emotions were significantly more enhanced by performing acts of kindness compared to a waitlist control condition, MANOVA was conducted with the mean score of positive emotions during the intervention (T1-T2/2) and at post-test (T3). Moreover MANOVA was further conducted to examine which specific positive emotions did significantly enhance well-being at post-test (T3).

After that, the Cohen’s  $d$  effect sizes were computed by subtracting the mean score of each positive emotion and mental well-being at post-test of the experimental condition from the mean of the control condition  $d = \frac{\bar{x}_1 - \bar{x}_2}{s_p}$  and dividing the results through the pooled standard deviation  $s_p = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1 + n_2 - 2}}$  (Cohen, 1988). A Cohen’s  $d$  of 0.2 indicates a small effect, while  $d = 0.5$  indicates a medium effect and a 0.8 indicates a large effect (Cohen, 1988).

Lastly, in order to examine if positive emotions mediate the relationship between acts of kindness and mental well-being, the PROCESS plug-in was used (Preacher & Hayes, 2008). The condition was coded as 1 for the pro-social behaviour condition and 0 for the waitlist-condition. In this model, the  $a$ -path describes the effect of performing kindness acts on positive emotions (difference mean score T2-T1). The  $b$ -path on the other hand describes the effect of the possible mediators’ positive emotions on mental well-being. Further, the direct effect of the independent variable condition, on the dependent variable mental well-being at post-test was represented through path  $c'$ . The total effect of performing kindness acts on mental well-being, when controlling for the mediators positive emotions was tested by the  $c$ -path. Lastly, the  $a*b$ -path

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describes the indirect effect of the condition on mental well-being , mediated through positive emotions. Based on 5000 bootstrapping samples, estimation took place of the bias corrected 95% (BC) confidence intervals (CI). As stated by Hayes (2008) a significant effect can be considered when the CI of the direct effect does not include zero (Preacher & Hayes, 2008).

### Results

#### Baseline characteristics

The sample was composed of 253 participants in total (226 females, 27 males) from the general Dutch population. Age ranged from 23 to 70 years, with a Mean Age of 48 ( $SD = 9.82$ ). ANOVA's and Chi-square tests revealed no significant differences in the demographical variables at baseline (see Table 1). Moreover, no significant differences in the outcome variables at baseline were revealed between the conditions.

**Table 1.** Baseline characteristics of the Participants in the study (n=253).

	Acts of kindness ( <i>n</i> =169)	Waitlist ( <i>n</i> =84)	Total ( <i>n</i> =253)	<i>p</i> <sup>a</sup>
Age, M (SD)	48 (9.82)	49 (9.34)	48 (9.82)	.561
Female gender, n (%)	151 (89.3)	75 (89.3)	226 (89.3)	.976
Educational status, n (%)				.671
Low/middle	36 (21.3)	18 (21.4)	54 (21.4)	
High	133 (76.7)	66 (78.6)	199 (78.7)	
Marital status, n (%)				.912
Married	85 (50.3)	46 (54.8)	131 (51.7)	
Not married	84 (49.7)	38 (45.2)	122 (48.2)	
Living situation, n (%)				.507
Alone	41 (24.3)	21 (25.0)	62 (24.5)	
With others	128 (75.7)	63 (75.0)	191 (75.4)	.476

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Ethnicity, n (%)			
Dutch	160 (94.7)	80 (95.2)	240 (94.8)
Other	9 (5.3)	4 (4.8)	13 (5.1)
Work situation, n (%)			
Paid	136 (81.9)	66 (78.5)	202(79.8)
Unpaid/Other	33 (19.5)	18 (21.4)	51 (20.2)

.483

<sup>a</sup> Differences between conditions were tested with  $\chi^2$  tests and t-tests

### Drop-outs

Of the 251 participants, 198 (78%) completed T1, 171 (67%) completed T2 and 197 (77%) completed T3. A Chi-square test displayed significantly more drop-out rates at post-test in the acts of kindness condition 46 (27.2%) in comparison to the waitlist control condition 8 (11.9 %), [ $\chi^2 (1) = 7.63, p = .006$ ]. Further, Chi-square tests displayed no significantly more drop-out rates at in-between measure (T1, T2) in the acts of kindness condition in comparison to the waitlist control condition ( $p > 0.05$ ). Besides, dropouts did not significantly differ on outcome measures at baseline compared to the completers on mental well-being. Besides, dropouts did not significantly differ at demographics at baseline (T0) compared to the completers.

Results of the bivariate correlations between positive emotions and outcome measures at baseline are displayed in Table 2. Pearson correlation revealed that most of the positive emotions were significantly positively related to mental well-being ( $p < 0.05$ ), with an exception for the positive emotions feeling *moved* ( $p = .837$ ) and surprised ( $p = .707$ ). Pearson correlation revealed a weak ( $r = .01$ ) to moderate ( $r = .51$ ) correlation between positive emotions and mental well-being . While the positive emotion feeling *satisfied* ( $p < .001$ ) displayed the strongest significant association with mental well-being , indicating that participants who experience higher satisfaction also have higher levels of wellbeing.

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Table 2. Bivariate correlations between potential mediators and outcome measures at baseline.

	1	2	3	4	5	6	7	8	9
1.Mental well-being	1								
2.Feeling Interested	.33**								
3. Feeling Moved	.01	-.12							
4.Feeling Cheerful	.14*	.04	.19**						
5.Feeling Joyful	.35**	.12	.09	.49**					
6. Feeling Satisfied	.51**	.28**	.05	.21**	.36**				
7. Feeling Surprised	.02	.12	.29**	.17**	.18**	.19**			
8.Feeling Love	.19**	.09	.00	.03	.07	.04	.12		
9.Feeling Calm	.37**	.24**	.17**	.28**	.32**	.39**	.22**	.09	1

\*\*\* <.001

### **Effects on positive emotions and mental well-being at in-between and post-test measure**

MANOVAS revealed a significant effect of performing acts of kindness on mental well-being compared to the waitlist-condition at post-test [ $F(1,197) = 4.01, p = .047$ ]. This indicates that higher level perceived mental well-being was significantly more experienced in the acts of kindness condition compared to the waitlist condition at post-test. MANOVAS further revealed no significant effect of performing acts of kindness during the intervention on positive emotions, except for feeling calm [ $F(1,188) = 6.79, p = .010$ ]. This indicates that feeling calm was significantly more experienced in the acts of kindness condition compared to the waitlist-condition at in-between measure. Further, MANOVA revealed no significant effect of performing acts of kindness on positive emotions at post-test, except for feeling interested [ $F(1,197) = 3.94, p = .049$ ]. This indicates that feeling interested was significantly more experienced in the acts of kindness condition compared to the waitlist condition at post-test (Table 2).

MANOVAS further revealed significant effects of all positive emotions on enhancing mental well-being when performing pro-social behaviour compared to the waitlist-condition at post-test, except for feeling moved [ $F(1,197) = .390, p = .959$ ] and calm [ $F(1,197) = 1.41, p = .186$ ]. This indicates that feeling joyful, cheerful, interested, satisfied, loving and surprised did significantly enhance mental well-being when performing acts of kindness exercises compared to the waitlist-condition at post-test ( $p < 0.05$ ). Effect sizes ranged from small ( $d = .14$ ) to medium ( $d = .76$ ), while a marginal significant effect on mental well-being was revealed for feeling loving [ $F(1,197) = 1.93, p = .050$ ] and the strongest significant effect was revealed for feeling cheerful [ $F(1,197) = 4.25, p < .001$ ] and joyful [ $F(1,197) = 3.31, p < .001$ ] at post-test.



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**Table 2.** Means (SD) and Cohen's *d* effect sizes for mental well-being and positive emotions by condition.

	Time	<i>n</i>	Kindness Mean (SD)	<i>n</i>	Waitlist Mean (SD)	<i>F</i>	<i>p</i>	<i>d</i>
Mental well-being	Baseline (T0)	169	2.76 (.66)	84	2.79 (0.68)			
	Posttest (T3)	123	3.06 (.68)	75	2.86 (0.68)	4.01	.047	.29
Interested	Baseline (T0)	169	4.24 (1.16)	84	4.22 (1.08)			
	2-Weeks (T1)	116	4.23 (1.08)	82	4.09 (1.18)	.69	.406	.12
	4-Weeks (T2)	97	4.23 (1.05)	74	4.17 (.99)	.15	.700	.06
	Posttest (T3)	123	5.20 (.96)	74	4.89 (1.16)	3.94	.049	.29
Moved	Baseline (T0)	169	3.36 (1.91)	84	3.42 (1.98)			
	2-Weeks (T1)	116	3.30 (1.85)	82	2.86 (1.84)	2.67	.104	.24
	4-Weeks (T2)	97	3.11 (1.88)	74	3.05 (1.98)	.04	.842	.03
	Posttest (T3)	123	3.11 (1.87)	74	2.76 (1.54)	1.83	.178	.20
Cheerful	Baseline (T0)	169	3.38 (1.54)	84	3.82 (1.55)			
	2-Weeks (T1)	116	3.65 (1.39)	82	3.48 (1.46)	.66	.417	.12
	4-Weeks (T2)	97	3.77 (1.49)	74	3.85 (1.47)	.61	.436	.05
	Posttest (T3)	123	4.14 (1.58)	74	3.92 (1.52)	.92	.339	.14
Joyful	Baseline (T0)	169	3.56 (1.44)	84	3.74 (1.46)			
	2-Weeks (T1)	116	3.82 (1.28)	82	3.90 (1.40)	.15	.697	.06
	4-Weeks (T2)	97	4.03 (1.35)	74	3.71 (1.45)	2.12	.148	.23
	Posttest (T3)	123	4.47 (1.38)	74	4.11 (1.48)	3.05	.082	.25
Satisfied	Baseline (T0)	169	3.71 (1.39)	84	3.59 (1.36)			
	2-Weeks (T1)	116	4.03 (1.24)	82	3.91 (1.27)	.44	.510	.09
	4-Weeks (T2)	97	4.22 (1.39)	74	3.93 (1.35)	1.91	.169	.21
	Posttest (T3)	123	4.76 (1.37)	74	4.49 (1.51)	1.65	.199	.19
Surprised	Baseline (T0)	169	3.03 (1.87)	84	3.02 (1.86)			
	2-Weeks (T1)	116	3.02 (1.89)	82	2.96 (1.91)	.05	.821	.03
	4-Weeks (T2)	97	3.12 (1.91)	74	2.86 (1.80)	.81	.370	.14
	Posttest (T3)	123	3.11 (1.75)	74	2.77 (1.58)	1.91	.169	.20
Loving	Baseline (T0)	169	4.02 (1.36)	84	3.85 (1.22)			
	2-Weeks (T1)	116	4.24 (1.19)	82	4.20 (1.31)	.04	.850	.03

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	4-Weeks (T2)	97	4.17 (1.30)	74	3.95 (1.20)	1.22	.271	.18
	Posttest (T3)	123	4.92 (1.30)	74	4.89 (1.23)	.034	.854	.76
Calm	Baseline (T0)	169	3.70 (1.45)	84	3.63 (1.46)			
	2-Weeks (T1)	116	4.00 (1.32)	82	3.50 (1.33)	6.79	.010	.38
	4-Weeks (T2)	123	3.94 (1.33)	74	3.74 (1.45)	.920	.339	.14
	Posttest (T3)	123	4.55 (1.31)	74	4.28 (1.57)	1.66	.198	.19

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*Note.* n= sample size; SD= standard deviation *d* = Cohen's *d* for between group effect sizes

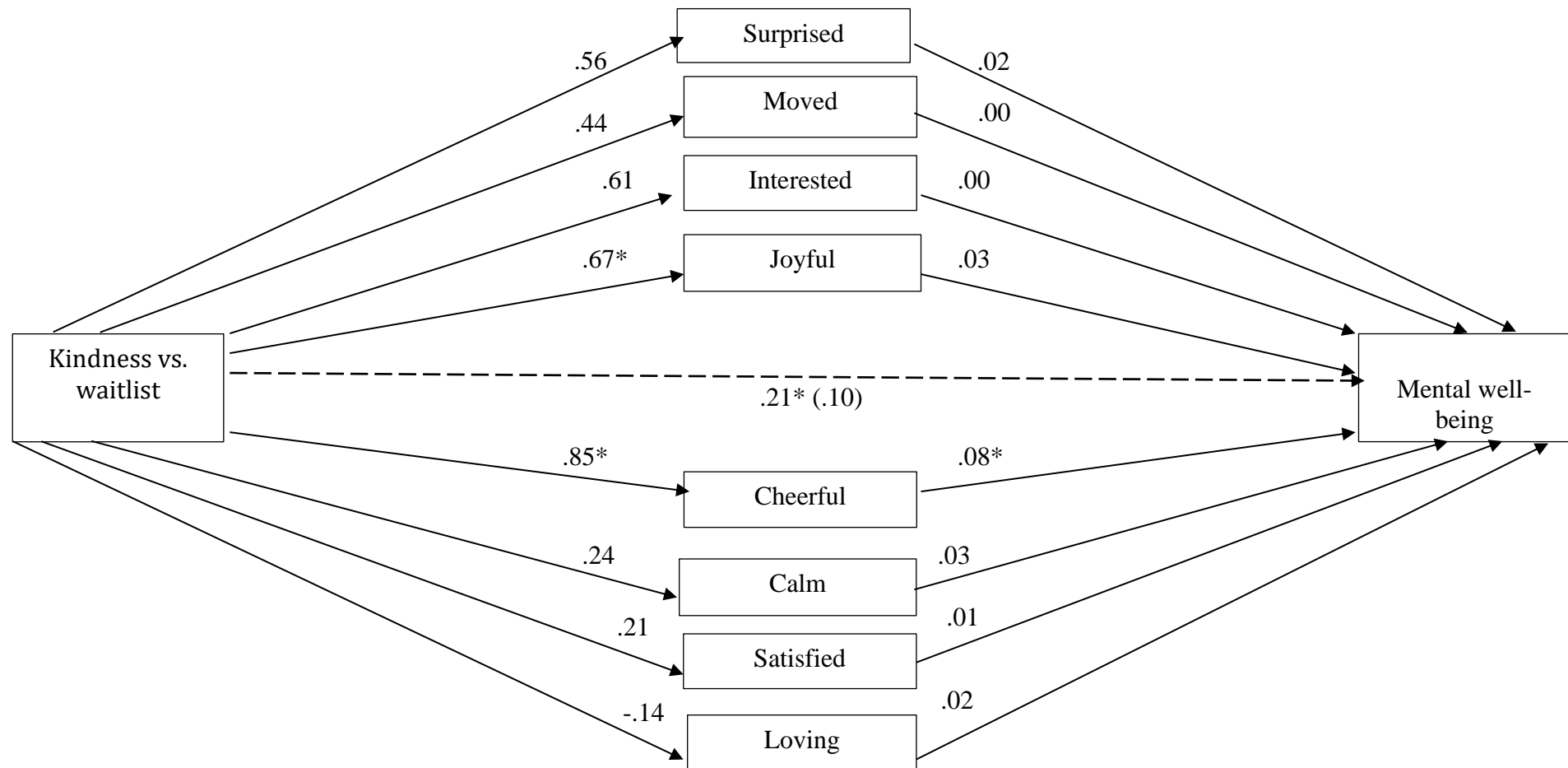
### The mediating effects of positive emotions

Results of the multiple mediation analyses of different positive emotions as mediators of the intervention group versus waitlist group on mental well-being are depicted in Figure 2.

Multiple mediation analyses revealed significant direct effects (a-path) for feeling cheerful  $b = .85$ ,  $SE = .294$ ,  $p = .004$  95% CI (.274, 1.43) and joyful  $b = .67$ ,  $p = .013$   $SE = .267$ , 95% CI (.146, 1.20) at in-between measure (Figure 2). This indicates that performing pro-social behaviour significantly predicted higher level perceived cheerfulness and joy during the intervention. Further, no significant direct effects of positive emotions on mental well-being were found at post-test, except for feeling cheerful  $b = .08$ ,  $SE = .028$ ,  $p = .004$  95% CI (.027, .137) (b-path), indicating that an increased level of feeling cheerful during the intervention predicted higher level of mental well-being at post-test.

Further analyses revealed a significant c-path  $b = .22$ ,  $SE = .10$ , 95% CI (.019, .413). This indicates that conducting acts of kindness significantly enhanced mental well-being compared to the waitlist-condition at post-test. Lastly, the results of the analyses displayed one significant indirect effect for performing acts of kindness on mental well-being with feeling cheerful as a mediator since the bias-corrected bootstrap confidence intervals (CIs) did not contain zero 95% CI (.015, .157). Therefore, the positive emotion cheerful was revealed as a significant mediator between acts of kindness and mental well-being compared to the waitlist-condition at post-test (a\*b-path). This indicates that the effect of performing pro-social behaviour on mental well-being at post-test can be explained by an increased level of feeling cheerful during the intervention compared to the waitlist-condition.

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**Figure 2.** Multiple mediation of different positive emotions as mediators (T1 + T2) of the intervention group versus waitlist group on mental well-being . Notes: Values are unstandardized Betas; \*\*  $p < .01$ ; \*  $p < .05$

### Discussion

The main goal of this study was to gain more knowledge about positive emotions as change process in acts of kindness interventions. This study is the first study investigating the mediating effect of eight positive emotions (interested, moved, cheerful, joyful, satisfied, surprised, loving, calm) specifically rather than focusing on positive emotions in general. The results of the current study demonstrated that a six-week acts of kindness intervention significantly enhanced mental well-being compared to the waitlist-condition. Furthermore, the only positive emotion which was significantly enhanced, when conducting six-week acts of kindness intervention was feeling interested. Therefore, performing acts of kindness was only significantly effective in enhancing feeling interested compared to waitlist-condition at post-test. Further results revealed that the majority of all 8 positive emotions during the intervention led to significant improvement of mental well-being at post-test. However feeling moved and calm did not significantly enhance mental well-being at post-test. Most importantly, the relationship between acts of kindness and mental well-being was mediated by feeling cheerful. Therefore, the effect of performing pro-social behaviour on mental well-being at post-test can be explained by an increased level of feeling cheerful during the intervention compared to the waitlist-condition.

There are several important findings worth to discuss.

In line with our expectations, the six-week acts of kindness intervention was significantly effective in enhancing mental well-being, compared to the waitlist-condition at post-test. The results of the current study are consistent with several previous studies that revealed a significant effect of pro-social behaviour on mental well-being (Nelson et al., 2016, Lyubomirsky & Layous, 2013, Alden & Trew, 2013, Otake et.al., 2006). For instance, Nelson et al., 2016 conducted a 6-week longitudinal experiment to examine the effectiveness of pro-social behaviour on mental well-being compared to neutral behaviour. In line with our current findings, Nelson et.al.,2016 revealed that pro-social behaviour was significantly effective in enhancing mental well-being, compared to neutral behaviour. Further, a study by Alden and Trew (2013) examined the effectiveness of a 4-week acts of kindness intervention on mental well-being in a social anxious sample. In line with our current findings, the results of the study revealed that performing acts of kindness led to significant improvement of mental well-being. Moreover, both studies revealed that pro-social behaviour significantly enhanced positive emotions (Nelson et al., 2016, Alden & Trew, 2013). The results of the current study revealed that six-week acts of kindness intervention only significantly increased one specific positive emotion compared to the waitlist-condition at post-test. Additionally, the

effect size was small. However, these contradicting findings might be explained by the differences in the sample. The study sample of Alden and Trew (2013) was solely composed of social anxious participants that scored in the top third of distribution on the Social Interaction Anxiety Scale (IAS). In comparison, the current study categorized the presence of serious depressive or anxiety symptoms as exclusion criteria for this study. The sample of the current study was therefore composed of non-anxious participants. Comparing these two samples, anxious participants might be able to experience a stronger enhancement in positive emotions in relation to non-anxious individuals who might already experience a higher level of positive emotions. Support for this assumption comes from a meta-analysis of 51 PPIs with 4,266 Individuals by Lyubomirsky (2009). This study examined the effectiveness of PPIs on mental well-being and depression. Lyubomirsky (2009) argued that individuals suffering from psychopathologies like depression are likely to benefit the most from PPIs, since depressed individuals benefit from larger increases in positive emotions compared to healthy individuals (Fredrickson & Levenson, 1998, Tugade & Fredrickson, 2004).

Further results of this study identified, feeling moved and calm as the only positive emotions that did not significantly enhance mental well-being at post-test in the acts of kindness condition. Interestingly, Haidt (2003) argue that especially the positive emotion feeling moved is strongly related to pro-social behaviour and mental well-being.

However, the finding in the current study revealed, that higher-level feeling moved was not significantly related to mental well-being. Several authors reported that the experience of feeling moved was elicited when witnessing others performing virtues acts that improve welfare of other persons, rather than actively engaging in pro-social behaviour (Haidt, 2003, Hanich, Wagner, Shah, Jacobsen & Menninghaus, 2014). For example, Haidt et al. (2000) revealed that passively witnessing acts of virtue enhanced feeling moved rather than actively engaging in pro-social acts. Haidt et al. (2000) further argued that witnessing kind acts of others could change individual views in humanity through broadening the momentary thought-action repertoires, leading to the perception of more optimism, which can result in the enhancement of mental well-being in the sense of the broaden and build theory (Frederickson, 1998). Therefore, the null findings in the present study for the feeling moved might be explained by the fact that participants in the current study were instructed to actively engage in pro-social behaviour rather than witnessing kind acts of others. This might have resulted in no significant enhancement of mental well-being due to perceived feeling moved.

Other findings of the current study which was contrary to expectations, revealed that only an increased level of feeling cheerful during the intervention mediated the relationship

between pro-social behaviour and mental well-being compared to waitlist-condition at post-test. In the field of positive psychology, prior studies investigated the importance of positive emotions as a significant change mechanism in PPIs (Sheldon & Lyubomirsky, 2006, Frederickson & Joiner, 2002, Lyubomirsky & Layous, 2013, Nelson, 2015, 2016). However, these studies investigated positive emotions by the use of the PANAS, assumed to be biased towards high arousal positive emotions (Sheldon & Lyubomirsky, 2006, Frederickson & Joiner, 2002) and by the use of the Affect-Adjective Scale (Diener & Emmons, 1984), which assesses positive and negative emotions simultaneously and not solely positive emotions. As mentioned before Nelson et al. (2016) conducted a comparably study, by assessing the mediating effects of positive emotions between pro-social behaviour and mental well-being. Nelson and colleagues (2016) identified positive emotions as significant mediators between pro-social behaviour and mental well-being. Although, Nelson et.al, (2016) made no differentiation between specific positive emotions since positive emotions were investigated on in general not separately. By contrast, our study investigated 8 specific high and low arousal positive emotions simultaneously by the use of the mDES (Fredrickson, 2013, Schaefer, Nils, Sanchez, & Philippot, 2010). Therefore, previous studies like Nelson et.al (2016) did not treat positive emotion in much detail. Considering the huge difference in methods in previous studies, no study has examined one potential specific positive emotion as significant mediators between acts of kindness and mental well-being. Investigating on positive emotions separately rather than in general, compared to previous studies, might result in less significant findings of the current study. It is therefore not surprising that the current study revealed only perceived cheerfulness as a significant mediator between pro-social behaviour and mental well-being, based on differences in approach on how positive emotions were assessed.

Further, the main results of our current study support previous findings on the effectiveness of feeling cheerful on mental well-being. A previous study identified feeling cheerful as a significant contributor to mental well-being (Papousek & Schulter, 2008). Papousek and Schulter (2008) conducted a study on discovery training to enhance cheerfulness to promote the improvement of mental well-being. Other researchers came to similar conclusions and emphasized cheerfulness as a significant predictor of mental well-being (Martin, 2001, Newman & Stone, 1996, Ventis, Higbee, & Murdock, 2001). These researcher argued that feeling cheerful promotes humour of seeing things or serious circumstances as more positive, less threatening and therefore with greater distance which can lead to the improvement of mental well-being (Martin, 2001, Newman & Stone, 1996,

Ventis, Higbee, & Murdock, 2001). Lucas et al., 2000 further argued that individuals who experience a higher level of cheerfulness are more likely to engage in interpersonal contacts with others. Since pro-social behaviour takes place within an interpersonal context, this might explain why especially higher level feeling cheerful mediated the relationship between pro-social behaviour and mental well-being. However, Papousek and Schuler (2008) further argue that the significant association between cheerfulness and mental well-being might be influenced by underlying factors like gender. Several studies identified differences in emotion expression and mental well-being among male and female gender (Hill, Rubin, Peplau, & Willard, 1979, Rosenthal & Rosnow, 1975). More precisely Holt, Cheryl, and Ellis (1998) argue that females tend to be more cheerful in general. These findings indicate, that the results of the current study might be explained to some extent by the overrepresentation of female participants. Therefore, more research is needed to investigate perceived cheerfulness as significant mechanism between pro-social behaviour and mental well-being, since influencing factors like gender might play a role.

### **Strengths and Limitations**

The present study has several strengths and limitations. The first strength of this study was the randomized controlled study design wherein participants conducted acts of kindness exercises in the period of 6-weeks. This study design allows a more causal conclusion of the current results compared to cross-sectional studies. Another strength of this study was that positive emotions were measured separately by means of 8 specific positive emotions rather than on positive emotions in general, as previous studies did. This allows a more comprehensive measure of positive emotions and provides more insight into the role of positive emotions. Further, the statistical analyses were based on the latest development in the field of mediation analysis and literature (Preacher & Hayes, 2008).

However, the results should be interpreted with caution. It is possible that a selection bias occurred, because the current sample was mainly composed of higher educated women. Since this problem was reported in similar research of positive psychological research (Schotanus-Dijkstra et al., 2017) this indicates that higher educated women might be more attracted to volunteer in this type of exercises in comparison to lower educated and male participants. Other literature on sex differences and mental well-being indicate an overall trend of women tending to report a lower level of mental well-being in comparison to men during studies (Haring, Stock & Okun, 1984) and differ in emotion expression in comparison to men (Chiang, 2018). Therefore, generalizing the current findings to the general Dutch

population is not contingent, since women tend to be more cheerful than men according to literature (Holt, Cheryl, and Ellis, 1998).

Lastly, this study used the mDES questionnaire for assessing positive emotions, which displayed a low internal consistency ( $\alpha=.59$ ) in the current study. Consequently, a lower accuracy of the measurement might result due to a lower internal consistency (George & Mallery, 2003). One explanation for this low psychometric property might be the fact, that the mDES is not translated properly for a Dutch sample since the original mDES is developed in the French language. At this juncture, no study validated the psychometric properties of the mDES in a Dutch sample before. The results of the current study might be therefore biased due to measurement error and should be interpreted with caution. Lastly, Nelson (2016) emphasized the need to include an active control condition, in order to actively control for influencing demanding factors and characteristics in the study. The results of the present study might be overestimated, since the current study implemented a waitlist-control condition rather than an active control condition.

### **Implications for future research**

Most importantly for future research is to replicate the current findings in more representative samples for generalizing these findings. To establish a more diverse sample regarding gender and educational level, future studies are recommended to include more participants with lower educational background and more male participants. Based on the current sample study, we assume that acts of kindness interventions might be more attractive for higher educated female participants, in comparison to lower educated and male participants. It is recommended for future research to investigate more on advertisements for approaching male participants. For this, advertisements can be placed for specifically targeting male participants. By this, advertisements should be implemented within predominated male organizations and work fields. Further, it is recommended for future research to implement a waitlist-condition and an active control condition likewise, to identify the effectiveness of kindness interventions more precisely, since other factors might influence the effects of kindness interventions. It is further recommended for future research on PPIs's, to examine specific emotions, to see whether different types of exercises work differently via enhancing specific emotions. Since acts of kindness interventions might work differently by enhancing different positive emotions in comparison to other PPIs that focus on self-compassion (Nelson, 2016).



### **Conclusion**

In sum, this study strengthened the importance and usefulness of pro-social exercises on specific positive emotions and mental well-being. Several previous studies emphasized the importance of promoting mental well-being through the enhancement of positive emotions. This study revealed that performing acts of kindness is promising for promoting mental well-being by enhancing perceived cheerfulness. Based on the current findings, it is recommended for future studies to investigate more in-depth on more PPIs to examine whether different types of exercises work differently via enhancing specific emotions. Conclusively, when individuals strive for greater mental well-being, it is advised to engage in pro-social behaviour through the greater experience of cheerfulness.

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## THE MEDIATING EFFECT OF POSITIVE EMOTIONS

### References

- Alden, L. E., & Trew, J. L. (2013). If it makes you happy: Engaging in kind acts increases positive affect in socially anxious individuals. *Emotion, 13*(1), 64-75.
- Bolte, A., Goschkey, T., & Kuhl, J. (2003). Emotion and intuition: Effects of positive and negative mood on implicit judgments of semantic coherence. *Psychological Science, 14*, 416-421.
- Chiang, W.-T. (2018). Gender differences in emotional expressions: A cross-situational analysis. *Bulletin of Educational Psychology, 49*(3), 345-366. doi: 10.6251/BEP.201803\_49(3).0001
- Cohn, M. A., Fredrickson, B. L., Brown, S. L., Mikels, J. A., & Conway, A. M. (2009). Happiness unpacked: Positive emotions increase life satisfaction by building resilience. *Emotion, 9*, 361-368. <http://dx.doi.org/10.1037/a0015952>
- Danner DD, Snowdon DA, Friesen WV. Positive emotions in early life and longevity: Findings from the nun study. *Journal of Personality and Social Psychology* 2001;80:804-813. [PubMed: 11374751]
- Easterbrook JA. The effect of emotion on cue utilization and the organization of behavior. *Psychological Review.* 1959; 66:183-201. [PubMed: 13658305]
- Diener, E. (1984). Subjective mental well-being . *Psychological Bulletin, 95*, 542-575.
- Diener, E. Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2009). New Mental well-being Measures: Short Scales to Assess Flourishing and Positive and Negative Feelings. *Social Indicators Research, 97*, 143. doi:10.1007/s11205-009-9493-y
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology, 2*(3), 300-319. doi:10.1037//1089-2680.2.3.300
- Fredrickson BL, Mancuso RA, Branigan C, Tugade M. The undoing effect of positive emotions. *Motivation and Emotion* 2000;24:237-258.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden and-build theory of positive emotions. *American Psychologist, 56*, 218-226. doi:10.1037/0003-066X.56.3.218
- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional mental well-being . *Psychological Science, 13*, 172- 175. <http://dx.doi.org/10.1111/1467-9280.00431>
- Fredrickson, B. L., & Branigan, C. A. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition and Emotion, 19*, 313-332.

## THE MEDIATING EFFECT OF POSITIVE EMOTIONS

- Fredrickson, B. L., & Losada, M. F. (2005). Positive Affect and the Complex Dynamics of Human Flourishing. *American Psychologist*, 60(7), 678-686. doi:10.1037/0003066x.60.7.678
- Fredrickson, B. (2009). *Positivity: Groundbreaking research reveals how to embrace the hidden strength of positive emotions, overcome negativity, and thrive*. New York, NY, US: Crown Publishers/Random House.
- Fredrickson, B. L., & Losada, M. F. (2013). "Positive affect and the complex dynamics of human flourishing": Correction to Fredrickson and Losada (2005). *American Psychologist*, 68(9), 822. <http://dx.doi.org/10.1037/a0034435>
- George, D. & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference*. 11.0 update (4th ed.). Boston: Allyn & Bacon.
- Haidt, J., Algoe, S., Meijer, Z., Tam, A., & Chandler, E. C. (2000). *The elevation-altruism hypothesis: Evidence for a new prosocial emotion*. Unpublished manuscript, University of Virginia, Charlottesville.
- Hanich, J., Wagner, V., Shah, M., Jacobsen, T., & Menninghaus, W. (2014). Why we like to watch sad films: The pleasure of being moved in aesthetic experiences. *Psychology of Aesthetics, Creativity, and the Arts*, 8, 130–143. <http://dx.doi.org/10.1037/a0035690>
- Haring, M. J., Stock, W. A., & Okun, M. A. (1984). A Research Synthesis of Gender and Social Class as Correlates of Subjective Mental well-being. *Human Relations*, 37(8), 645-657. doi:10.1177/001872678403700805
- Have, M., Walburg, J.A., Bohlmeijer, E.T., 2016c. What factors are associated with flourishing? Results from a large representative national sample. *J. Happiness Stud.* 17, 1351–1370.
- Hill, C. T., Rubin, Z., Peplau, L. A., & Willard, S. G. (1979). The volunteer couple: Sex differences, couple commitment, and participation in research on interpersonal relationships. *Social Psychology Quarterly*, 42(4), 415-420. <http://dx.doi.org/10.2307/3033813>
- Holt, Cheryl L. and Jon B. Ellis (1998), "Assessing the Current Validity of the Bem Sex-Role Inventory," *Sex Roles*, 39 (11/12), 929-941.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879-891.
- Huppert, F. A., & Whittington, J. E. (2003). Evidence for the independence of positive and negative mental well-being : Implications for quality of life assessment. *British Journal of Health Psychology*, 8, 107–122.
- Izard, C. E. (1992). Basic emotions, relations among emotions, and emotion-cognition relations.

## THE MEDIATING EFFECT OF POSITIVE EMOTIONS

*Psychological Review*, 99(3), 561-565. doi:10.1037/0033-295x.99.3.561

- Keyes, C. L. M. (1998). Social mental well-being . *Social Psychology Quarterly*, 61(2), 121-137.
- Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, 43, 207–222.
- Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing mental well-being : The empirical encounter of two traditions. *Journal of Personality and Social Psychology*, 82(6), 1007-1022.
- Keyes, C. L. M. (2004). The nexus of cardiovascular disease and depression revisited: The complete mental health perspective and the moderating role of age and gender. *Aging and Mental Health*, 8, 266-274.
- Keyes, C. L. M. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, 73, 539-548. doi:10.1037/0022-006x.73.3.539
- Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist*, 62, 95–108. <http://dx.doi.org/10.1037/0003-066X.62.2.95>
- Keyes, C.L.M., Dhingra, S.S., Simoes, E.J., (2010). Change in level of positive mental health as a predictor of future risk of mental illness. *Am. J. Public Health* 100, 2366–2371.
- Lamers, S. M. A. (2012). *Positive mental health: Measurement, relevance and implications*. Enschede, the Netherlands: University of Twente.
- Lamers, S., Westerhof, G. J., Bohlmeijer, E. T., ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the mental health continuum-short form (MHC SF). *Journal of clinical psychology*, 67(1), 99-110. doi:10.1002/jclp.20741
- Larson, R. W., Clore, G. L., & Wood, G. A. (1999). The emotions of romantic relationships: Do they wreak havoc on adolescents? In W. Furman, B. B. Brown, & C. Feiring (Eds.), *The development of romantic relationships in adolescence* (pp. 19–49). New York: Cambridge University Press.
- Layous, K., Lee, H., Choi, I., & Lyubomirsky, S. (2013). Culture matters when designing a successful happiness-increasing activity: A comparison of the United States and South Korea. *Journal of Cross-Cultural Psychology*, 44, 1294-1303.
- Layous, K., Nelson, S. K., & Lyubomirsky, S. (2013). What is the optimal way to deliver a positive activity intervention? The case of writing about one's best possible selves. *Journal of Happiness Studies*, 14, 635–654. <http://dx.doi.org/10.1007/s10902-012-9346-2>
- Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of

## THE MEDIATING EFFECT OF POSITIVE EMOTIONS

- sustainable change. *Review of General Psychology*, 9(2), 111–131. doi:10.1037/1089-2680.9.2.111
- Lyubomirsky, S., & Layous, K. (2013). How do simple positive activities increase mental well being ? *Current Directions in Psychological Science*, 22, 57–62. <http://dx.doi.org/10.1177/0963721412469809>
- Markland, A. L., Pressman, S. D., & Cohen, S. (2006). Positive affect and immune function. In R. Ader (Ed.), *Psychoneuroimmunology*, 4e. New York: Academic Press.
- Martin, R. A. (2001). Humor, laughter, and physical health: Methodological issues and research findings. *Psychological Bulletin*, 127(4), 504–519. doi:10.1037//0033-2909.127.4.504
- Nelson, S. K., Della Porta, M. D., Jacobs Bao, K., Lee, H. C., Choi, I., & Lyubomirsky, S. (2015). ‘It’s up to you’: Experimentally manipulated autonomy support for prosocial behavior improves mental well-being in two cultures over six weeks. *The Journal of Positive Psychology*, 10(5), 463–476. doi:10.1080/17439760.2014.983959
- Nelson, S. K., Layous, K., Cole, S. W., & Lyubomirsky, S. (2016). Do unto others or treat yourself? The effects of prosocial and self-focused behavior on psychological flourishing. *Emotion*, 16(6), 850–861. doi:10.1037/emo0000178
- Newman, M. G., & Stone, A. A. (1996). Does humor moderate the effects of experimentally induced stress? *Annals of Behavioral Medicine*, 18(2), 101–109. doi:10.1007/bf02909582
- Otake, K., Shimai, S., Tanaka-Matsumi, J., Otsui, K., & Fredrickson, B. L. (2006). Happy people become happier through kindness: A counting kindnesses intervention. *Journal of Happiness Studies*, 7, 361–375. <http://dx.doi.org/10.1007/s10902-005-3650-z>
- Park, N., & Peterson, C. (2009). Character strengths: Research and practice. *Journal of College and Character*, 4, 1–10.
- Papousek, I., & Schultze, G. (2008). Effects of a mood-enhancing intervention on subjective well being and cardiovascular parameters. *International Journal of Behavioral Medicine*, 15(4), 293–302. doi:10.1080/10705500802365508
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891. doi:10.3758/brm.40.3.879
- Rosenthal, R., & Rosnow, R. L. (1975). *The volunteer subject*. New York: Wiley.
- Rowe, G., Hirsch, J., & Anderson, A. K. (2005). *Positive mood broadens the attentional spotlight*. Manuscript in preparation.

## THE MEDIATING EFFECT OF POSITIVE EMOTIONS

- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological mental well-being. *Journal of Personality and Social Psychology*, 57(6), 1069-1081. doi:10.1037//0022-3514.57.6.1069
- Ryff, C. D. (1995). Psychological mental well-being in adult life. *Current Directions in Psychological Science*, 4, 99-104.
- Schaefer, A., Nils, F., Sanchez, X., & Philippot, P. (2010). Assessing the effectiveness of a large database of emotion-eliciting films: A new tool for emotion researchers. *Cognition & Emotion*, 24(7), 1153-1172. doi:10.1080/02699930903274322
- Schotanus-Dijkstra, M., Pieterse, M. E., Drossaert, C. H., Westerhof, G. J., De Graaf, R., Ten Have, M., Bohlmeijer, E. T. (2016). What Factors are Associated with Flourishing? Results from a Large Representative National Sample. *Journal of Happiness Studies*, 17(4), 1351-1370. doi:10.1007/s10902-015-9647-3
- Schueller, S. M., & Parks, A. C. (2014). The science of self-help. *European Psychologist*, 19(2), 145–155. doi:10.1027/1016-9040/a000181
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology. An introduction. *American Psychologist*, 55(1), 5–14.
- Seligman, M. E. P. (2002). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. New York, NY: Free Press.
- Seligman, M. E. P. (2011). *Flourish*. New York, NY: Free Press.
- Sheldon, K. M., Boehm, J. K., & Lyubomirsky, S. (2012). Variety is the spice of happiness: The hedonic adaptation prevention (HAP) model. In I. Boniwell & S. David (Eds.), *Oxford handbook of happiness* (pp. 901–914). Oxford, United Kingdom: Oxford University Press.
- Stroud, C. B., & Davila, J. (2008). Pubertal Timing and Depressive Symptoms in Early Adolescents: The Roles of Romantic Competence and Romantic Experiences. *Journal of Youth and Adolescence*, 37(8), 953-966. doi:10.1007/s10964-008-9292-9
- Stroud, C. B., Davila, J., & Moyer, A. (2008). The relationship between stress and depression in first onsets versus recurrences: A meta-analytic review. *Journal of Abnormal Psychology*, 117(1), 206-213. <http://dx.doi.org/10.1037/0021-843X.117.1.206>
- Tugade, M. M. & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, 86, 320-333.
- Ventis, W. L., Higbee, G., & Murdock, S. A. (2001). Using Humor in Systematic Desensitization to Reduce Fear. *The Journal of General Psychology*, 128(2), 241-253. doi:10.1080/00221300109598911

## THE MEDIATING EFFECT OF POSITIVE EMOTIONS

- Watson, D., & Naragon-Gainey, K. (2010). On the specificity of positive emotional dysfunction in psychopathology: Evidence from the mood and anxiety disorders and schizophrenia/schizotypy. *Clinical Psychology Review, 30*(7), 839-848. doi:10.1016/j.cpr.2009.11.002
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.
- Grello, C.M., Welsh, D.P., Harper, M.S. & Dickson, J.W. (2003). Dating and sexual relationship trajectories and adolescent functioning. *Adolescent and Family Health, 3*, 103-112.
- Westerhof, G. J., & Keyes, C. L. M. (2010). Mental illness and mental health: The two continua model across the lifespan. *Journal of Adult Development, 17*, 110-119.