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The longitudinal relation between positive self-defining memories, self-esteem and depressive symptoms among the general population

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Abstract

Background. Depression is one of the commonly occurring psychological diseases worldwide. Unfortunately, psychotherapeutic treatment is largely unavailable in primary care settings. Therefore, accessible and effective treatment approaches are necessary in order to reduce depressive symptoms. Literature shows that retrieving specific and positive memories might be an option worth investigating because it is believed to reduce depressive symptoms and because it is accessible. In order to include reminiscence into a treatment approach, one has to know the mechanisms which play a role in reducing depressive symptoms. Previous research indicates a positive relationship between positive self-defining memories, self-esteem and depressive symptoms. Self-esteem might be one of the mechanisms, which play a role when individuals are subjected to reminiscence activity. Since little research investigated this relationship, the current research focused on this topic.

Objective. Previous research suggested that there is a relationship between positive self-defining memories, self-esteem and depressive symptoms. This research aims to investigate the relationship between those variables.

Method. In 2012, a longitudinal questionnaire study was carried out with three measurements of self-defining memories and one measurement of self-esteem and depressive symptoms among 1193 Dutch participants (51,6 % female, mean age: 59 years). The relationship between these variables were analyzed with a mediation analyses.

Results. Positive self-defining memories over time were related to self-esteem. Positive self-defining memories over time were related to depressive symptoms. Self-esteem was related to depressive symptoms and the relationship of positive self-defining memories with depressive symptoms was partially mediated by self-esteem.

Conclusion. The results indicate that positive self-defining memories are related to self-esteem which in turn is related to depressive symptoms. Self-esteem accounts for some, but not all, of the relationship between positive self-defining memories and depressive symptoms. The findings of this research support models and theories about the relationship between self-defining memories, self-esteem and depressive symptoms. However, further research is needed in order to make a causal statement about the relationship between positive self-defining memories, self-esteem and depressive symptoms. The current results support the theory of the upward spiral of depressive symptoms. Moreover, positive self-defining memories could be used as an approach to prevent a depressive episode.

1. Introduction

Over 300 million people worldwide suffer from a depression, which can become a severe health condition. Depression causes the affected person to endure pain and perform poorly at work, in social and personal domains (World Health Organization, 2018). Fewer than half of the people suffering from a depression get access to treatment due to a lack of trained health-care providers and a lack of resources (World Health Organization, 2018). Moreover, life expectancy is increasing globally because of the progress in medical care, resulting in a great number of elderly people needing care and a smaller number of younger people who can provide it (van Gemert-Pijnen, Peters & Ossebaard, 2013). As people get older, it becomes more probable that they will suffer under a depression because they might experience a loss in psychological, social or physiological functioning (Chiang, Chu, Chang, Chung, Chen, Chiou & Chou, 2010). However, receiving psycho-therapeutic treatment might be a challenge because it is largely unavailable in primary care settings (Peng, Huang, Chen & Lu, 2009). To conclude, making treatment for depression accessible is an important and crucial step to provide health care for the increasing number of people who need it. One way to provide accessible treatment or an approach to reduce depressive symptoms might be possible by using ones memories with the help of reminiscence. This approach could be used in several ways, e.g. online, in a structured conversation at home or at a meeting with a selected group. This would make it more accessible than usual care because one would not have to wait for an appointment with a therapist.

Reminiscence is the process of recalling personal memories. These memories can be special or general episodes, which might have been forgotten and accompanied by feelings that the recalled episodes are truthfully perceptions of the original experience (Bohlmeijer, Steunenberg & Westerhof, 2011). When reminiscence is applied in a more structured way, it is called life-review. Differently than reminiscence, life review systematically uses the whole life story. It should be actively asked about memories which shall enhance the participant's positive identity and problem-solving ability (Bohlmeijer et al., 2011). Life-review therapy utilizes life-review by connecting it to a coherent theory of causal elements of depression or mental illnesses. Life review therapy concentrates on decreasing bitterness revival and boredom, but also on changing one's point of view on one's past in a positive way. Moreover, it integrated applied psycho-therapeutic techniques, such as problem solving therapy, narrative therapy and cognitive therapy (Pinquart & Forstmeier, 2012). For individuals suffering from a depression, reviewing one's life in a positive manner might be challenging. As research shows, depressive patients tend to recall more general (negative) memories instead of specific ones. This is also a predictor for an unhealthy progress of the depression and for a greater probability of relapse

(Bohlmeijer et al., 2011). Therefore, recalling specific positive memories with the help of reminiscence, life review or life review therapy might be a promising option for treatment. The last decade, empiric research regarding the functions of reminiscence and the mechanisms of the autobiographic memory increased, which led to clinical implementation and better theoretical substantiation (Bohlmeijer et al., 2011).

Lamers, Bohlmeijer, Korte and Westerhof (2014) investigated the efficacy of life-review as online-guided self-help for adults among the general population and found that life-review is effective as online-guided self-help on depressive symptoms. Meanwhile, life-review therapy and cognitive behavioral therapy are the two most effective treatments for depression for older adults (Bohlmeijer et al., 2011). In addition to this, not only older adults benefit from this concept, but also young adults benefit from it. Hallford and Mellor (2016) investigated online reminiscence activity (problem solving, self-defining and negative events) in young adults. Their findings suggested that reminiscence for problem-solving and identity functions is a predictor for the enhancement of well-being and an increased positive self-concept, along with decreasing negative affect (Hallford & Mellor, 2016). A meta-analyses of Pinquart et al. (2012) revealed positive effects of reminiscence on depression, psychological well-being, ego-integrity, meaning of/purpose in life, cognitive performance, social integration and preparation for death. Nevertheless, there is little research done about the mechanisms of reminiscence (Bohlmeijer et al., 2011).

Bohlmeijer, Roemer, Cuijpers and Smit (2007) found that life-review had greater significant effect on well-being than reminiscence. One explanation for this could be that life-review solicits the attendant to actively ask for memories, which enhances the positive identity and problem solving of the participant (Bohlmeijer et al., 2011). Another explanation might be that reminiscence has positive effects on ego-integrity, which is in line with Butler's (1963) assumption that reminiscence aids in the progress of accepting the attitude towards one's own life. Liao, Bluck and Westerhof (2017) investigated the relations between self-defining memories and self-esteem among the general Dutch population. Individuals make use of self-defining memories in order to characterize themselves. They are realistic, lifelike memories that are charged with emotions, often rehearsed and an essential part of adult personality (Liao et al., 2007). The findings of Liao et al. (2017) suggested that recalling a greater number of positive self-defining memories to mainstay one's personality can be a predictor in generating self-esteem. Moreover, individuals who characterize their personality with the help of positive memories tend to make meaning of, and constructively utilize their self-defining memories (Liao et al., 2017). Furthermore, Liao et al. (2017) argue that individuals, who can generate

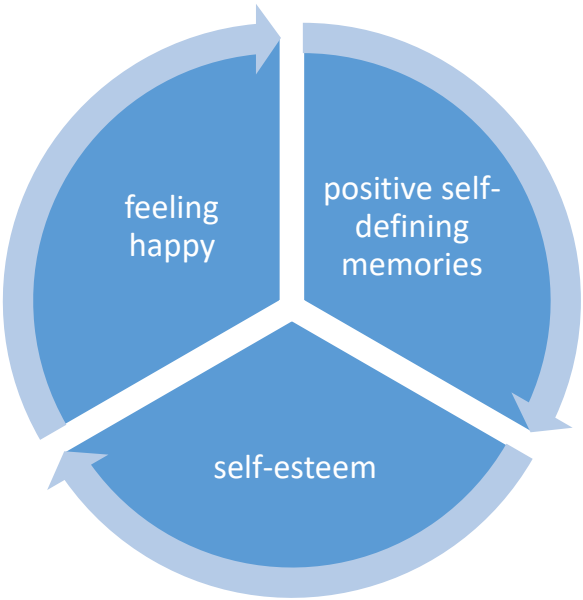
self-esteem through engaging in positive meaning-making, can use these memories to distribute adaptive psychological functions. Liao et al. (2017) also suggested that with the help of positive meaning making regarding ones self-defining memories, individuals can generate self-esteem, which then circles back to form personality and social-cognitive processes (i.e., meaning, functioning). This means that retrieving positive self-defining memories might create an upward spiral of positive meaning making, generating self-esteem and distributing adaptive psychological functioning. In turn, positive meaning making gets enhanced, which also enhances self-esteem and psychological functioning and so forth. This process might be a counterpart against the mechanisms of negative thoughts and memory processes of depressive individuals. The mechanisms of negative thoughts and memory processes are factors, which maintains depressive symptoms (Hermans & Putte, 2004). Understanding these mechanisms might help in developing or investigating an approach to reduce depressive symptoms.

Research shows that when individuals feel unhappy, they tend to retrieve more negative memories about themselves (Hermans & Putte, 2004). People with a depressive disorder feel unhappy and/or lost the interest in activities they previously enjoyed (Hermans & Putte, 2004). This causes a change in the autobiographic memory, which leads to a difficulty in recalling autobiographic experiences. This feeling of unhappiness also leads to retrieving more general negative memories about oneself. In turn, negative automatic thoughts about oneself emerge, which get more believable and create a greater feeling of unhappiness. This feeling of unhappiness leads to retrieving a greater amount of negative memories. The negative memories create more believable negative automatic thoughts about oneself and so forth, resulting in a negative downward spiral of depressive symptoms (Hermans & Putte, 2004). Williams (1996) stated that over-general memories occur when people make shortcuts during their general retrieval at a too high level. Therefore, mostly general memories are accessed rather than specific memories. With this idea in mind, Williams (2006) developed the CaRFAX model to illustrate how over-general memories in depression come to exist. In consonance with the CaRFAX model, three primary factors accentuate the shortened specificity of autobiographic memories: capture and rumination (CaR), functional avoidance (FA), and impaired executive control (X). Over-general memories occur when the process of memory retrieval is interrupted due to one or more of these factors *(*Ros, Latorre, Serrano & Ricarte, 2017). Capture and rumination refer to the activation of rumination by conceptual self-relevant information, during the retrieval of ones memories. This rumination "captures" mental assets and interrupts the retrieval search. Functional avoidance addresses the prevention of recalling specific memories in order to control ones affect. Functional avoidance is a result of reactions which appear as a

result of representations of previous difficult situations and trauma, causing a negative affect when retrieving specific memories of unfavorable events. Retrieving unspecific memories results in less negative affect and is more pleasant for the individual (Ros et al., 2017). The last factor, impaired executive control, addresses a lack in executive functions, which restrict recalling specific memories successfully.

The findings of Ros et al. (2017) affirm a positive relationship between depressive symptoms, rumination and functional avoidance, regardless of age. Hamlat, Connolly, Hamilton, Stange, Abramson and Alloy (2015) found that both girls and boys, who retrieved a smaller amount of specific memories, tend to demonstrate more depressive symptoms when challenged with life stress in comparison to people with more specific memories. Thus, specific memories may provide a protective mechanism against depressive symptoms. Therefore, retrieving more general and less specific memories may serve as a vulnerability mechanism for the progress of depressive symptoms, especially when combined with higher levels of stress and rumination (Ros et al., 2017). Hence, when specifically asking about positive self-defining memories would result into generating more self-esteem and meaning making, this downward spiral of negative memories might be able to be opposed (figure 1). Liao et al. (2017) found that positive self-defining memories were related to self-esteem. Therefore, it might be possible that self-esteem is a working mechanism of positive self-defining memories.

Figure 1. Upward spiral of positive self-defining memories



Self-esteem is an essential predictor of operating in several life domains beyond the lifetime (e.g. job satisfaction, health, relationships). It implies feelings of being satisfied with one's self, feelings of being capable and valuable (Liao et al. 2007). Low self-esteem is likely to encompass many of the characteristics of depressive symptoms such as self-relevant distortions,

negative self-relevant cognitions and cognitive biases (Moritz & Roberts, 2018). The vulnerability model states that low self-esteem is a risk factor for depressive symptoms. This might be connected to the suggestion that negative beliefs about one's self play a crucial role in the etiology of depression. In addition to that, the scar model states that low self-esteem is perceived as an aftereffect, rather than a cause of depression. It is argued that depression may cause long-lasting changes (i.e. "scars") in the self-concept of individuals which in turn effects self-esteem (Orth, Robins, Meier & Conger, 2016). However, overall findings from longitudinal studies greatly support the vulnerability model and only provide little evidence for the scar model (Orth et al., 2016). Nevertheless, there seems to be a mutual relationship between self-esteem and depression (e.g. low self-esteem increasing depressive symptoms and depressive symptoms decreasing self-esteem). Regarding the mechanisms that play a role in the vulnerability effect of self-esteem, research showed that rumination partially mediated the effect of self-esteem on depression. Low self-esteem was shown to predict growth in rumination and rumination predicted growth in depression. Because of the partially mediation, it is probable that further mechanisms play a role in the relationship between rumination, self-esteem and depression. Moreover, the vulnerability effect of self-esteem on depression was indicated as generalizable across two western countries (United States and Germany) (Orth et al., 2016).

To conclude, an accessible and effective approach would be beneficial in order to reduce depressive symptoms due to the increasing number of people who suffer from a depression. Retrieving general and negative memories is one of the factors which maintain depressive symptoms. With regard to this, recalling positive self-defining memories with the help of reminiscence or life-review is related to the enhancement of well-being, positive self-concept and it also decreases negative affect. Therefore, the mechanisms of positive self-defining memories might be worth investigating in order to get a better understanding why it has positive effects on the well-being. Literature indicates that self-esteem might be one mechanism of reminiscence because it can be generated when retrieving self-defining memories. Research showed that rumination partially mediated the effect of self-esteem on depression. Low self-esteem was shown to predict growth in rumination and rumination predicted growth in depression. With the help of positive self-defining memories one might reduce or oppose rumination, resulting in more self-esteem and in a decrease of depressive symptoms. Due to the several investigations regarding the downward spiral of depressive symptoms, this research focuses on finding evidence on the upward spiral of depressive symptoms. With regard to the theoretical framework, the following research question with its four hypothesis will be

elaborated: To what extent does self-esteem mediate the relationship between positive self-defining memories and depressive symptoms?

Hypothesis 1: Positive self-defining memories over time are related to self-esteem.

Hypothesis 2: Positive self-defining memories over time are related to depressive symptoms.

Hypothesis 3: Self-esteem is related to depressive symptoms.

Hypothesis 4: Self-esteem mediates the relationship between positive self-defining memories and depressive symptoms.

2. Method

2.1 Participants and procedure

The participants from this research were participants of the Longitudinal Internet Studies in the Social Sciences (LISS) panel, conducted by CentERdata in the Netherlands. The LISS panel covers 5000 randomly chosen households (e.g. more than 11,000 people), which makes it a good representation of the Dutch population. This sample was not clinical and there were no specific exclusion criteria. Every month, the participants filled out the questionnaires online. In 2012, 3076 participants were asked to take part in the research about identity memories. One participant per household participated in this research.

Table 1. Demographic characteristics of participants.

Demographic characteristics		
Number of participants (%)	1193	(100)
Sex, n (%)		
Male	577	(48,4)
Female	616	(51,6)
Age (years)		
Mean (SD)	59	(15)
Range	16 – 92	
Position within the family (%)		
Household head	812	(68,1)
Wedded partner	305	(25,6)
Unwedded partner	22	(1,8)
Parent (in law)	1	(0.1)
Child living at home	47	(3.9)
Housemate	5	(0.4)
Family member or boarder	1	(0.1)
Civil Status (%)		
Married	695	(58.3)
Separated	6	(0.5)
Divorced	147	(12.3)
Widow or widower	140	(11.7)
Never been married	205	(17.2)
Level of education with diploma (%)		
Primary school	55	(4.6)
VMBO (US: Junior high school)	368	(30.8)
HAVO/VWO (US: Senior high school)	97	(8.1)
MBO (US: Junior college)	237	(19.9)
HBO (US: College)	281	(23.6)
WO (US: University)	135	(11.3)
Other	16	(1.3)
Not (yet) started any education	4	(0.3)

In May 2012 was the first point of measurement, the second point of measurement was in November 2012 and in May 2013 was the last point of measurement. Every participant who did not complete the questionnaires on each point of measurement was excluded from the analyses.

Regarding the self-defining memory task, participants had to have nine memories in total. If this was not the case, the questionnaire was considered as incomplete, which resulted in a sample size of 1193. The demographic characteristics of the participants are illustrated in table 1.

Older people were over-represented in this analyses (Mean=59), the distribution between men (48.4%) and women (51.6%) is balanced and most of the participants are the head of the household (68%) and married (58%).

2.2 Measures

2.2.1 Self-defining memory task (SDMT)

The self-defining memory task is a questionnaire developed by Jefferson Singer, which askes the participant to write down three emotionally charged memories (Blagov & Singer, 2004). These memories are vivid and important for the participant with regard to his or her personality. Moreover, these memories have to be at least one year old and are related to positive and/or negative feelings. At each of the three points of measurement three self-defining memories were provided by the participants with the help of standard instructions (i.e., modified version of Blagov & Singer, 2004). In total, nine self-defining memories were provided by each participant. The instructions for providing the self-defining memories were as follows: *When we tell other people about who we are, we often tell something about our past. We would like to ask you to illustrate some personal memories that display who you are. These are memories which define you as a person. What kind of memories are we asking about? We are asking about memories that are crucial to you. They vividly appear in your consciousness. They are related to strong negative or positive feelings. They came frequently into your mind. We would like to ask you to name three memories of this description which date back at least one year.* At first, the respondents were asked to briefly name the memories. Afterwards, the memories should be described in detail and it should be explained why this memory is characterizing for the participant. The SDMT is evaluated as valid and reliable (Blagov & Singer, 2004).

The valence of the self-defining memories was assessed by categorizing the memory narratives into neutral, positive or negative ones (Liao et al., 2017). Events that are commonly acknowledged as negative (e.g., divorce, death, illness) were coded as negative. Events that are generally considered as positive (e.g., achievements, births, weddings) were coded as positive. Events that were primarily an illustration without a distinctly negative or positive interpretation were coded as neutral (e.g., “my parents were inland navigation skipper. I am therefore a skipper’s child and lived on boat during my childhood and adolescence”) (Liao et al., 2017).

For example, one participant could have four positive memories, three negative memories and two neutral memories.

Inter-coder reliability was tested by two coders who used 50 narratives from a pilot study, resulting in a good inter-coder reliability (Cohens's kappa = .85) (Liao et al., 2017). The score for positive self-defining memories were constructed by adding all positive self-defining memories. The participants could report nine positive self-defining memories at most and zero at least. Higher scores demonstrate a higher average of positive self-defining memories of the participant.

2.2.2 Self-esteem

Self-esteem was measured using the 10-item Rosenberg (1965) scale (e.g., *I feel that I have a number of good qualities*) at the last point of measurement. Three additional items were included to determine judgments about one's physical appearance, competence and overall self-esteem (i.e., *I am satisfied with the way I look, I have confidence in my capabilities, I feel good about myself*). The participants could agree or disagree to these statements by using the following scale: 1 = *totally agree* to 7 = *totally disagree*. Five item were reverse scored. Adding the sum-scores of the 13 items resulted in assessing the variable for self-esteem, which could range from 13 to 91. Higher mean scores demonstrate higher self-esteem. The measure has excellent internal consistency in this study (Cronbach's $\alpha = .91$).

2.2.3 Depressive symptoms

Depressive symptoms were measured with the Hospital Anxiety and Depression Scale (HADS) at the last point of measurement. The participants answered 14 questions on a four point scale (0-3), seven items for the depression scale and seven items for the anxiety scale. Only the depression scale was used for the current research. Adding the sum-scores of the seven items resulted in assessing the variable for depressive symptoms which could range from 0 to 21. Scores of less than seven indicate no clinical relevance, scores of eight to ten indicate mild depressive symptoms, scores of 11 to 14 indicate a moderate level of depressive symptoms and scores of 15 to 21 indicate a severe depressive symptoms (Stern, 2014). The HADS displays good reliability and validity (Spinhoven et al., 1997). The measure has good internal consistency in this study (Cronbach's $\alpha = .79$).

2.3 Data Analysis

SPSS 21 was used to perform the statistical analyses. At first, the descriptive statistics of the variables have been assessed. Afterwards, a two-sided correlation analyses was computed in order to illustrate how the three variables relate towards one another. A correlation coefficient of .00 to .30 (.00 to -.30) can be considered as a very weak positive (negative) correlation. A correlation coefficient of .30 to .50 (-.30 to -.50) can be considered as a weak positive (negative) correlation. A correlation coefficient of .50 to .70 (-.50 to -.70) can be considered as a moderate positive (negative) correlation. A correlation coefficient of .70 to .90 (-.70 to -.90) can be considered as a strong positive (negative correlation). A correlation coefficient of .90 to 1.00 (-.90 to -1.00) can be considered as a very strong positive (negative) correlation (Hinkle, Wiersma & Jurs, 2003). To investigate how self-esteem mediates the relationship between positive self-defining memories and depressive symptoms, the version 2.16 of the PROCESS macro for SPSS was used. Within the macro, model 4 (figure 2) and 1000 bias corrected bootstrap samples were selected. A 95% confidence level was chosen to apply a p-value of 0.05. Using these settings, four analyses were performed. In the mediation analyses, positive self-defining memories were selected as independent variable, self-esteem was selected as mediation variable and depressive symptoms were selected as dependent variable. For the mediation analyses, three regressions have been conducted. In order to verify the first hypothesis, the first regression had positive self-defining memories predict self-esteem. In order to verify the second hypothesis, the second regression had positive self-defining memories predict depressive symptoms. In order to verify the third hypothesis, the third regression had self-esteem predict depressive symptoms. In order to verify the fourth hypothesis, the fourth regression had positive self-defining memories and self-esteem predict depressive symptoms (figure 2).

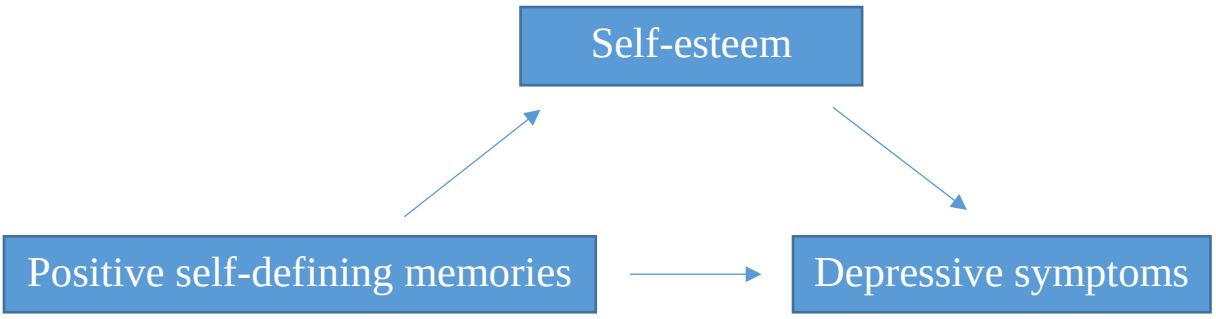


Figure 2. Path diagram of the mediation analyses.

In order to verify the mediation, four conditions must be met. First, self-defining memories must be related to depressive symptoms (regression 1). Second, self-defining memories must be related to self-esteem (regression 2). Third, in the final regression, self-esteem should remain a significant predictor of depressive symptoms. Fourth, in the final regression, self-defining memories should no longer significantly predict depressive symptoms. If all four conditions are met, full mediation is supported. If only the first three conditions are met, then partial mediation is supported if the coefficient for self-defining memories decreases. If less than three conditions are met, then the expectation will not be fulfilled. Lastly, the indirect effect of self-defining memories on depressive symptoms was calculated as well as the sobel test.

3. Results

3.1 Descriptive statistics

The descriptive statistics of the positive self-defining memories, the depressive symptoms and the self-esteem scale are displayed in table 2. The average participant had 3.67 positive self-defining memories. The mean score for self-esteem was 72.7, which can be considered as high due to the maximum score of 91 and the minimum score of 19. The mean score for depressive symptoms was 3.86, which can be considered as low, indicating no clinical relevance (Stern, 2014).

Table 2. Descriptive Statistics and amount of positive self-defining memories. N = 1193

	Positive memories	Self-esteem	Depressive symptoms
Mean	3.67	72.7	3.86
Std. deviation	2.16	11.56	3.23
Minimum	0	19	0
Maximum	9	91	18

3.2 Correlation analyses

Table 3 illustrates a very weak positive correlation between positive self-defining memories and self-esteem ($r = .102$, $n = 1193$, $p < .001$). Table 3 also shows a very weak negative correlation between positive self-defining memories and depressive symptoms ($r = -.217$, $n = 1193$, $p < .001$) and a weak to moderate negative relationship between self-esteem and depressive symptoms ($r = -.496$, $n = 1193$, $p < .001$). Therefore, as the numbers of positive self-defining memories increased, the amount of self-esteem increased and the depressive symptoms decreased. Moreover, as the amount of self-esteem increased, the amount of depressive symptoms decreased.

Table 3. Correlations of positive self-defining memories, self-esteem and depressive symptoms. N = 1193

	Positive memories	Self-esteem	Depressive symptoms
Self-esteem			
Pearson correlation	.102*	1	-.496*
Depressive symptoms			
Pearson correlation	-.217*	-.496*	1

* Correlation is significant at the 0.01 level (2-tailed)

3.3 Mediation analyses

In line with hypothesis 1, the results of the mediation analyses demonstrated that positive self-defining memories were a significant predictor of self-esteem (b= .54, SE= .15, CI= .2388; .8446, $p < .001$). Table 4 shows the results of the regression and mediation analyses with depressive symptoms as dependent variable. Positive self-defining memories were a significant predictor of depressive symptoms in model 1 which is in line with the second hypothesis. Both, positive self-defining memories and self-esteem, were significant predictors of depressive symptoms in model 2, which is in line with the third hypothesis. In accord with the fourth hypothesis, positive self-defining memories remained to be a significant, but smaller predictor of depressive symptoms after controlling for the mediator, consistent with partial mediation. Approximately 27% of the variance in depressive symptoms was accounted for by the predictors. The indirect effect was tested using a bootstrap estimation approach with 1000 samples. These results indicated that the indirect effect of positive self-defining memories on depressive symptoms was significant (Table 4). The sobel test displayed a Z-score of -3.446, $p < .001$. Figure 3 illustrates the path diagram of the mediation analyses.

Table 4. Results of the mediation model of Hayes with depressive symptoms as dependent variable

	B score	SE	LLCI	ULCI
Model 1				
Positive self-defining memories	-.32	.04	-.40	-.24
Model 2				
Positive self-defining memories	-.25	.03	-.32	-.17
Self-esteem	-.13	.006	-.14	-.12
Indirect effect of positive self-defining memories on depressive symptoms	-.07	.02	-.11	-.03

Model 1: $R^2 = .04$, p<. 0001; Model 2: $R^2 = .27$, p< .0001

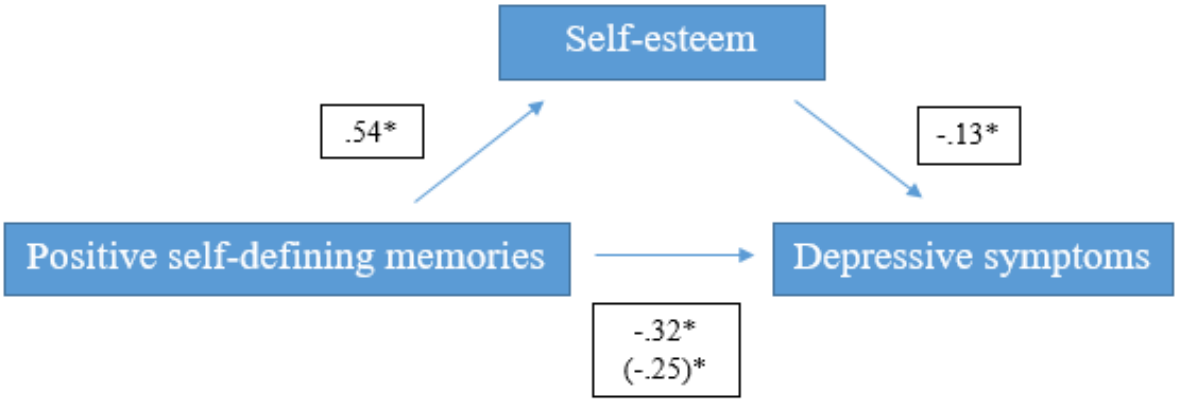


Figure 3. Path diagram of the mediation analyses, *p < .001

4. Discussion

It was expected that self-esteem mediated the relationship between positive self-defining memories and depressive symptoms. The correlation analyses showed that there was a very weak relationship between positive self-defining memories and depressive. Furthermore, there was a very weak relationship between positive self-defining memories and self-esteem. The correlation analyses also illustrated a low to moderate relationship between self-esteem and depressive symptoms. Higher levels of positive self-defining memories were related to higher levels of self-esteem and lower levels of depressive symptoms. Moreover, higher levels of self-esteem was related to a lower level of depressive symptoms. The first hypothesis "positive self-defining memories over time are related to self-esteem" was supported by the findings of the current research as well as the second hypothesis "positive self-defining memories over time are related to depressive symptoms". The third hypothesis "self-esteem is related to depressive symptoms" along with the fourth hypothesis "self-esteem mediates the relationship between positive self-defining memories and depressive symptoms" was also supported by the results of the current research. Therefore, all four hypotheses were supported by the results of the current research. Regarding the research question "to what extent does self-esteem mediate the relationship between positive self-defining memories and self-esteem", the mediation analyses indicated that self-esteem is a small and partial mediator of the relationship between self-defining memories and depressive symptoms. The indirect effect of positive self-defining memories on depressive symptoms was associated with lower depressive symptoms as mediated by self-esteem. Due to the partial mediation, it is assumed that more factors play a role in the working mechanisms of positive self-defining memories. The results of the mediation analyses indicated that positive self-defining memories are related to self-esteem which in turn is related to depressive symptoms. However, in order to be able to make a clear statement about how the variables in this research influence each other, another design has to be applied.

The current research is, therefore, limited by its design. Without a randomized experimental design, a cause-effect statement cannot be made. There was no intervention, no control group and no measurement of self-esteem at the beginning of the study. Moreover, the mean score of the participants on the depression scale indicated no clinical relevant depressive symptoms (Stern, 2014). It is, therefore, difficult to draw conclusions regarding the relationships between depressive symptoms and the other variables because the average participant can be considered healthy. It is also noteworthy that the mean score for self-esteem was relatively high. It is unfortunate that there was no measurement at the beginning and no control group in order to relate the score to positive self-defining memories. With regard to this

low level of depressive symptoms and the high level of self-esteem in the sample, it is noticeable that the mean score of positive self-defining memories was not that high. On the one hand, one might expect people with high self-esteem and low levels of depressive symptoms to collect more positive self-defining memories. On the other hand, one could also assume that the process of coping with bad periods of life might contribute to an increase in self-esteem and a decrease in depressive symptoms. These descriptive statistics could be one explanation why the indirect effect of positive self-defining memories on depressive symptoms was that low. If the participants would have had more depressive symptoms and lower self-esteem at the beginning of this research, the indirect effect might have been higher. Assuming there would have been a pre- and post-test to gather this information. However, the relationship could have also been weaker if the participants would have clinical relevant depressive symptoms because a higher level of depressive symptoms could be related to having more difficulties to retrieve positive self-defining memories. This might be one topic worth investigating in future research.

The results of this study support the findings of Lamers et al. (2014) who found that life review is effective on depressive symptoms. These findings were supported by the results of the current study because positive self-defining memories were found to be a significantly related to depressive symptoms. Hallford & Mellor (2016) found that reminiscence for problem-solving and identity functions is a predictor for the enhancement of well-being and an increased positive self-concept. These suggestions can also be supported by the results of the current investigation, which found that positive self-defining memories were related to self-esteem and depressive symptoms. Moreover, an increase in positive self-defining memories were related to an increase in self-esteem and to a decrease in depressive symptoms. The vulnerability model states that low self-esteem is a risk factor for depression (Orth et al., 2016). This model was supported by the findings of the current research due to the correlational relationship between self-esteem and depressive symptoms but also because the results indicated that self-esteem is related to depressive symptoms and partially mediated the relationship between positive self-defining memories and depressive symptoms. The findings of Liao et al. (2017) suggested that with the help of positive self-defining memories, people can generate self-esteem, which then aids to form personality and social cognitive processes. Hence, creating an upward spiral of positive meaning making, self-esteem and adaptive psychological functioning. This suggestion can be supported by the results of this research because self-esteem partially mediated the relationship between positive self-defining memories and depressive symptoms. The vulnerability model states that low self-esteem is a risk factor for depression (Orth et al., 2016). The mediation analyses found self-esteem to be significantly related to

depressive symptoms and that high levels of self-esteem were related to low levels of depressive symptoms. Therefore, the results can support the statement that self-esteem is related to depressive symptoms, but one cannot make a statement if it is a risk factor or not. The scar model argued that depression may cause long-lasting changes in the self-concept, which affects self-esteem (Orth et al., 2016). This argumentation can be supported by the result of the correlation analyses of this research, which indicated that high levels of self-esteem were related to low levels of depressive symptoms. Moreover, it was found that the relationship of positive self-defining memories with depressive symptoms is partially related to self-esteem. Self-esteem might be a mechanism that can be related to a decrease in depressive symptoms. This would also support the theory of the upward spiral, which has the idea that with the help of positive self-defining memories, one could oppose the negative spiral of depression. The findings of this research indicated that self-esteem was related to positive self-defining memories and depressive symptoms. Furthermore, the mediation analyses found that the relationship of positive self-defining memories with depressive symptoms is partially related to self-esteem. Hence, positive self-defining memories are related to self-esteem which in turn is related to depressive symptoms.

Bohlmeijer et al. (2011) stated that there is little research done about the mechanisms of reminiscence. This research was dedicated to do exactly so. Although one cannot make a cause-effect statement, the results can be seen as an indication for evidence and as an incentive to investigate the relationship between positive self-defining memories, self-esteem and depressive symptoms further. Another positive aspect of the current study is that the questionnaires for positive self-defining memories, self-esteem and depressive symptoms have a good internal consistency. For the reason that there were mainly elderly individuals participating in this research, the results cannot be generalized to the general population, but they could be considered as generalizable for the elderly population. The significant results of the current study can be viewed as a motivation for further investigation, in order to get to know more about the working mechanisms of positive self-defining memories and to contribute to the development of an effective and accessible approach to reduce depressive symptoms. Certainly, further research with another design is needed to explore the relationship of positive self-defining memories, self-esteem and depressive symptoms in detail. In order to make a cause-effect statement, a randomized experimental design with an intervention, such as the online guided self-help intervention Lamers et al. (2014) used, needs to be applied. Another option would be to use the self-defining memory task. Furthermore, a sample size, which actually suffers under a depression, is required in order to monitor a decrease in depressive

symptoms after the intervention. Therefore, a pre- and post- test is required to assess the level of depressive symptoms and self-esteem. It would also be interesting to know if patients with a severe depression could make use of this approach. With regard to this, research should be executed with different participants. These participants could be divided into different groups, depending on their level of depressive symptoms. Moreover, the participants should also be divided into three groups. One group should collect positive self-defining memories, one group collects neutral self-defining memories and the last group collects negative self-defining memories. Consequently, one would get a more precise understanding of the effects of self-defining memories. Lastly, a control group will be required in order to demonstrate more reliable and valid results. Thus, it would be possible to make a trustworthy statement regarding the cause-effect relationship between positive self-defining memories, self-esteem and depressive symptoms.

4.1 Implications

Positive self-defining memories were related to self-esteem and depressive symptoms. Moreover, self-esteem partially mediated the relationship between positive self-defining memories and depressive symptoms. Therefore, it is indicated that self-esteem is part of the working mechanism of positive self-defining memories. Literature indicated a need for information on how or why reminiscence works. The results of this research can be viewed as a starting point for more investigation on the relationship between positive self-defining memories and its working mechanisms. Since self-esteem partially mediated the relationship between positive self-defining memories and depressive symptoms, other variables might play a role in the relationship between positive self-defining memories and depressive symptoms. Future research should concentrate on investigating this relationship further in order to form a more precise theory on the upward spiral of depression. It might also be that people with a moderate to severe depression have difficulties to retrieve positive self-defining memories, resulting in no reduction of depressive symptoms. Therefore, it would be interesting to investigate the relationship between positive self-defining memories and depressive symptoms in a clinical setting. Nevertheless, the results of this research can be seen as an incentive to investigate the mechanism of the upward spiral of depression further. Moreover, the results have practical implications. Positive self-defining memories, if further investigated, might contribute to an effective and accessible approach to reduce depressive symptoms in a clinical setting, but also in the prevention of severe depressive symptoms. Moreover, it might be helpful as a first intervention when people suffer from mild to moderate depressive symptoms. An example might be a patient, who has two to four depressive symptoms. Instead of transferring

the patient to a psychologist, one could use this approach first in order to prevent the patient from developing a depressive episode. Recalling positive self-defining memories can be done online or it could be done in groups, such as the groups for alcohol addicts. However, in order to make a cause-effect statement about the relationship of positive self-defining memories, self-esteem and depressive symptoms and to get to know more about the mechanisms and requirements of engaging in retrieving positive self-defining memories, further research is required.

4.2 Conclusion

The results indicate that positive self-defining memories are related to depressive symptoms due to the mediating effect of self-esteem. Positive self-defining memories are related to self-esteem which in turn is related to depressive symptoms. Therefore, self-esteem might be a mechanism or an important factor in the construct of positive self-defining memories. Hence, positive self-defining memories and self-esteem may play a crucial role in the future when treating or preventing depressive symptoms. It is concluded that self-esteem is important in the relationship between positive self-defining memories and depressive symptoms and may act as a preventing variable for clinical illnesses or in preventing them.

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