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I want to be the very best!

A systematic literature review on the efficiency of the Best Possible Self-Intervention

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Abstract

Objective: The meta-analysis by Sin and Lyubomirsky (2009) the results from Bolier et al. (2013) show the benefits of positive psychology interventions. This systematic literature review investigates one of these interventions, the best possible self-intervention (BPS-intervention). Participants imagine themselves in 5 to 10 years with all their goals accomplished, wishes fulfilled and problems solved. The aim of this systematic literature review is to explore under which conditions the BPS-intervention is implemented, and which are the most favourable conditions. Furthermore, which outcomes the BPS-intervention influences are also explored.

Method: A systematic review was conducted in the databases PsychInfo, Scopus, and PubMed, with the search string "Possible selves" AND one of the following terms: intervention OR therapy OR activity. English, Dutch or German journal articles were included when they conducted a randomized controlled trial, had the BPS-intervention as an experimental condition and assessed the outcomes. The review revealed 16 studies that fit the inclusion criteria and were analyzed for results.

Results: The main conditions researched in these studies were: age of the participants (<21, 21-30, >30), occupations of the participants (students, students and workers, and school children), the manner how the intervention was implemented (Online or in person, with or without a mental imagery exercise, duration, with open or domain-specific instruction) and the outcomes that can be influenced. The results show that the intervention works best with participants in the mixed occupation group and with older age. The implementation should be online and with domain-specific instructions. The duration of the intervention should be once for an immediate large effect and more often than twice a week for up to two weeks for a longer lasting effects. There was no difference found between the conditions with or without a mental imagery exercise. The outcomes changed significantly are optimism, positive affect, satisfaction with life and negative affect. Whereas Optimism was found to increase significantly in most of the studies whereas negative affect was found in least of the studies. The outcomes flow, self-esteem, self-efficacy, experiencing physical illness, mental well-being, subjective well-being, and purpose in life were each investigated by only one study and only the first four had a significant increase.

Conclusion and discussion: Conclusions can be made about the participants of the intervention and in which manner it should be implemented. The participants should be of older age and mature to gain the most benefit. They should decide when they want to engage in the intervention, but it should be in a given timeframe. The content of the intervention on the other hand, should undergo more research. For example, studies which integrated the mental imagery exercise had surprisingly the same effect as studies without it. Further research should focus on a better person-activity fit for the best possible self-intervention.

Introduction

Meta-analysis conducted by Sin and Lyubomirsky (2009), and Bolier et al. (2013) have shown the impact positive psychology interventions can have on subjective and psychological well-being, and depressive symptoms. The current systematic literature review investigates one of the positive psychology interventions; `The best possible self-intervention´ (BPS-intervention). The goal is to give an overview of how imagining oneself in the near future in the most positive manner can be utilized to set goals, which ultimately have an effect on various emotional, and mental states and therefore well-being.

To clarify how it came into existence, the theory, mechanisms and the forerunner of the BPS-intervention will be explained. To clarify how the BPS-intervention came into existence, the theory behind it, the mechanisms and benefits of imagining possible selves, an introduction to its forerunner, and the intervention itself will be explained. Lastly, there will be an overview of what is already known about the influence of the intervention, followed by the research questions for this review.

Possible Selves Theory

The self-concept contains ideas about the self; how we were in the past, how we are now and how we could be in a future life (Markus & Wurf, 1987). A self-concept that is well functioning is important because it upholds positive self-feelings, helps make sense of the present, gives indications for the future and guides motivation (Oyserman, 2001). The possible selves are a part of the self-concept. Markus and Nurius (1986) developed the Possible Selves Theory in which hopes and fears about what we were or could have been, and what we are and might become, are explained. Their definition sparked the beginning of research in this area. This introduction will go into depth on the future possible selves aspect of the possible selves theory, where the BPS-intervention is only focused on.

By imagining their possible selves, people can form ideas of how they might be different in the future from their current existence. Possible selves are separable from the present selves because they are imaginary future constructs of the self. Three forms of the possible selves exist. The feared selves are the worst versions of a person and evoke fear when imagining them as possibilities. The ideal selves are what a person wishes to become and the last selves are what a person might become, a more probable view of the possibilities.

If people think about whom they want to become, it is an endless range of possibilities influenced by sociocultural factors, such as up-bringing, the media and experiences among peers. Past selves that remain in the self-concept are forming the possible selves in the present

and future. Past selves could influence possible selves in the form of reminders that raise concern (Markus & Nurius, 1986).

Imagining possible selves in the future is valuable because they are serving two crucial functions: motivation and evaluation. Future possible selves motivate by approaching ideal possible selves and avoiding feared possible selves. By imagining an ideal possible self, people experience a positive affective state associated with being that self. Imagining the feared possible selves fitting emotions for danger. These affective states give indications for which behavior to avoid or to embrace. Thus, according to the definition of Markus and Nurius (1986) future possible selves are the connection between the self-concept and the motivation for changes in the desired direction.

The future possible-selves function as a reliable evaluation method assessing one's progress and present behavior towards their desired selves. Future possible selves hold the self-knowledge that is most responsive and sensitive to changes in the present self-concept (Markus & Nurius, 1986). For example, by gaining new information affecting the present self, the future possible selves will change.

The benefits of possible selves

One of the main benefits of having a good insight into which ideal selves to approach and into which feared selves to avoid is that a person has less ambivalence between personal goals (Bak, 2015). Emmons and King (1988) found that a conflict between goals is associated with high levels of negative affect, depression, psychosomatic complaints, and neuroticism. In a more recent research from Boudreaux and Ozer (2013), it was found that people with ambivalent goals ruminate and hesitate more frequently. The participants showed higher levels of anxiety, negative affect and depression, and reported more psychosomatic symptoms. Those with conflicting goals tended to visit health care centers more often (Emmons & King, 1988). Furthermore, striving towards a clear goal that is not in conflict with other goals can be beneficial for subjective well-being especially for positive affect (Omodei & Wearing, 1990). Oyserman and Markus (1990) support the hypothesis that a clear view of the ideal possible self and feared possible self is beneficial. They hypothesize that possible selves reach maximum motivational efficiency if they are balanced with each other. A feared possible self is most motivating when it has a counterpart ideal possible self in the same domain that gives some guidelines how to avoid the feared possible self. Thus, it is important to integrate both possible selves in the self-concept to reach the highest motivation

the possible selves can offer. In conclusion can be said, that imagining the possible selves can influence physical and psychological well-being by striving towards less ambivalent goals.

In the following, it will be explained how imagining possible selves might increase well-being. In the context of positive psychology, well-being is defined as not only the absence of pathology but also experiencing positive affect, reducing negative affect and being satisfied with life itself. It also means that a person is functioning optimally in their daily life, and experiences acceptance and integration from others socially (Deci & Ryan, 2008; Diener, 2000). To get a good insight on how possible selves can influence well-being, the meaning of "imagining possible selves" must be understood. Pham and Taylor (1999) define imagining as a mental simulation; a representation that imitates hypothetical or real events in the mind of a person.

How can mental simulation be used to influence psychological well-being? The findings by Pham and Taylor (1999) suggest that mentally simulating a wanted behavior or situation has an influence on the actual performance. The behavior and social capabilities are more often cognitively available to the person in the situation itself when imagined before the actual situation (Carroll, 1978). Anderson (1983) found the same results concerning the ideal selves. He concluded that imagining the behavior required to attain the ideal selves led to the actual behavior. The more frequently the behavioral script will be imagined, the greater the intention to behave that way. Markus and Wurf (1987), in line with the findings of Anderson (1983) concluded that imagining the possible selves could increase self-regulation. Increasing self-regulation leads to an increase in positive emotions and therefore well-being. An explanation for the increase in well-being could come from the expectancy-value model of motivation by Carver and Scheier (2001). The model shows that experiencing steps towards an important goal promotes positive emotions and therefore psychological well-being. Not only actual physical behavior can give the impression that steps are made towards a desired goal, mentally imagined positive scenarios in that direction can have the same effect (Carver & Scheier, 2001). It also gives people confidence that they can reach the goal that they have set for themselves, which consequently promotes positive emotions.

The best possible self-intervention

As summarized earlier imagining the ideal self and how to get there has many benefits. Therefore, an intervention that utilizes the possible selves, and especially the ideal selves, can be a useful tool to influence well-being by increasing positive and/or decreasing negative emotions. The best possible self-intervention is the positive psychology intervention where

these functions are incorporated. The possible selves´ intervention from which the best possible self-intervention derived will be explained in the following.

The Possible selves' intervention was first described by Day, Borowske, Punzo and Howsepian (1994). They developed the intervention to influence young Mexican American students' possible selves of being a good student. The design of the intervention focused on getting a balance between the feared possible selves and ideal possible selves to promote the motivation to change behavior in the ideal possible selves' direction. The focus of the intervention was on the students' present and future `feared/hoped possible selves´. The intervention included eight sessions in which the students made a connection between their present behavior and the influences of that behavior on their future selves.

King (2001) developed the BPS-intervention which focuses on the future hoped-possible selves. This intervention is designed to increase self-regulation, and therefore well-being, of the participants. Her research focused on the benefits from writing about an experienced traumatic event. She found that the positive outcomes were not necessarily related to the expression of negative emotions of past traumatic events but to the creation of a meaningful story. Therefore, the next step in her field of research was writing a coherent text that addresses positive emotions.

King (2001) found that the BPS-intervention allowed people to discover a highly motivational part of themselves by writing about ideal selves. As mentioned above, when the motivation of behavior is evident, self-regulatory processes increase, and well-being is promoted.

There are different variations as to how the BPS-intervention can be implemented, however, there are two basic steps involved. First, the participants visualize a future moment in their life where they have accomplished all their set goals, and become the best person they want to be. Second, the participants write a coherent text about the imagined life (King, 2001). Optionally, the intervention can include a following mental imagery exercise. The BPS-intervention emerged as a useful tool from a range of studies to decrease negative affect and depressive symptoms, and increase satisfaction with life, positive affect, and positive expectancies for the future (Liau, Neihart, Teo, & Lo, 2016; Peters, Flink, Boersma, & Linton, 2010).

Furthermore, in the meta-analysis by Malouff and Schutte (2016), which analyzed if optimism could be influenced by psychological interventions, the BPS-intervention exhibited the highest effect size. Optimism is seen as a personality trait with the primary set-point influenced by the environment a child grows up in (Heinonen, Räikkönen, & Keltikangas-

Järvinen, 2005). Crucial factors are the resources the parents have; financial security, their socioeconomic status, and emotional warmth (Heinonen et al., 2006).

Schreier and Carver (1992) state that optimistic people tend to assess future outcomes positively and pessimists mainly negatively, so in this context it should be problematic to change one´s way of thinking. However, it was found that activities and incidents could influence those to think more optimistically. Sweeny, Carroll and Shepperd (2006) showed that participants´ optimistic thinking was reduced when they experienced threats, although this was only temporarily exhibited before they reverted to their initial state of optimism.

Optimism can also be seen as an explanatory style; people with this style intend to give terrible events temporal and impersonal reasons, whereas individuals with the pessimistic explanatory style search for reasons for such events in themselves and see them as permanent and global in their personality (Gillham, Shatte, Reivich, & Seligman, 2001). One could argue that this form of optimism should be much harder to change. Malouff and Schutte (2016)´s meta-analyses only investigated if optimism could be influenced by positive psychology interventions. The current review intents not only to investigate optimism, but also other outcomes the BPS-intervention can effect.

It will also be investigated in which conditions the BPS-intervention should be implemented to maximize the desired outcomes, which until now, has not been prominently researched. Two meta-analyses, it is suggested in which conditions positive psychology interventions should best be implemented (Bolier et al. 2013; Sin & Lybormirsky 2009). Sin and Lyubomirsky (2009) found that positive psychology interventions have higher effect sizes if the participants are of higher age and therefore more mature.

This could also be true for the BPS-intervention when argued with the socioemotional selectivity theory by Charles, Mather, and Carstensen (2003). In this theory, it is considered that goals change depending on where a person is situated in their life span. A perspective shift occurs in individuals; with advanced age comes the realization that their time is not endless (Hoyle, 2006). Younger adults are more directed at obtaining knowledge and information, whereas older adults are more focused on acquiring emotional meaningfulness as soon as possible (Charles et al., 2003). An important part of this theory is the positivity bias, which states that processing positive emotional information is greater in older adults in comparison with younger adults. In their study, the younger participants were 19 to 30, and the older participants were 63 to 86 years old. However, it is suggested that the positivity bias is not necessarily a consequence of the chronological age of a person. It depends on the

perspective a person takes in the situation (Lynchard & Radvansky, 2012). If young participants take the perspective of a person between 63 or 86 years old, the positivity effect can occur.

Furthermore, the interventions in the meta-analysis by Sin and Lyubomirsky (2009) were most effective when they were implemented in an individual face-to-face setting. It was somewhat less effective in group-administered settings and the least effective in self-administered settings. Moreover, the longer the intervention is conducted, the more effective it seems to be. Lyubomirsky, Sheldon, and Schkade (2005) supported this finding in their study about the architecture of sustainable change. They researched how well-being can be pursued and maintained. In this approach, positive psychological interventions are considered "well-being activities" that increase the happiness of people above a well-being set-point. This set-point is established by the individual's nature and nurture. They found a greater increase in positive affect, the more often the participants completed an imagery exercise.

Another aspect of the implementation is the additional imagery exercise in which participants imagine themselves in their ideal life. Although, it is not necessarily part of the intervention, it could have a greater influence on the outcomes. Holmes, Coughtrey, and Connor (2008) found that the way participants imagine situations has an impact on the outcome. By comparing two imagery exercises with one verbal exercise, they were able to show that one of the imagery exercises had more effect on self-esteem and positive affect than the verbalization exercise. The imagery exercise, in which the participants imagine themselves in a situation "through their own eyes", had a greater impact on positive affect compared to the imagining exercise in which participants observing themselves in the imagined situation. The authors state that mentally imagining a situation is more effective because it implicates deep cognitive processing. The current review will investigate if the intervention with the additional mental imagery exercise has a greater influence on the outcomes than the intervention without the mental imagery exercise.

Bolier et al. (2013) support most of the findings by Sin and Lyubomirsky (2009) in their meta-analyses of randomized controlled trials with positive psychology interventions. They add that participants with psychosocial problems experience a larger decrease in negative affect and increase in positive affect. The same effect occurred when the participants were recruited via health care experts. In this literature review, it will be seen if the BPS-intervention is also more effective in these conditions.

To achieve an understanding of how and when to implement the BPS-intervention, the following research questions will be answered.

Research question: 1. Under which conditions is the best possible self-intervention implemented?

This review aims to investigate the participants' features and the researcher's method of application for the BPS-intervention.

Research Question 2: On which outcomes does the best possible self-intervention have an effect?

This question will be answered to show which outcomes are intended to be manipulated by the BPS-intervention. This should also show which of them are most often changed by the BPS-intervention.

Research Question 3: Under which conditions does the best possible self-intervention have the most effect?

It is intended to give a clearer view on how, for whom, and on which outcomes, to use the best possible-self intervention.

Method

To document the effectiveness of the BPS-intervention on different outcomes in different conditions, a systematic search was conducted.

Three relevant electronic databases were searched (Scopus, PsychInfo, and PubMed) with the following search string: “Possible selves” AND one of the following terms: intervention OR therapy OR activity. The year of publishing was not chosen as an excluding criteria to give a broad overview of relevant studies.

283 results were found with these search terms. Duplicates, dissertations, and book chapters were excluded. Only journal articles were included because they oblige to strict rules and are most reliable. The journal articles that were not written in English, Dutch or German were excluded. The remaining journal articles were screened, starting with the titles and abstracts. The inclusion criteria for the screening in this systematic literature review were: 1. It must involve the BPS-intervention in any form, 2. a random assignment of participants to the experimental and control conditions, and 3. an assessment of the outcome.

The results were checked against the results of the supervisor. An agreement was found on the exclusion of 120 studies and the inclusion of 28 studies. There was a disagreement on 26 studies. Six studies were initially included but excluded by the supervisor, and 20 studies were initially excluded but included by the supervisor. After a second screening, an agreement was reached to include 17 of the 26 studies in the full-text analyses. In total, 45 journal articles were included in the full-text analyses.

Eleven studies had fit all criteria for the qualitative synthesis. The references of these studies were undergoing the same procedure as the studies from the database-search. Six studies had fit all the inclusion criteria and were integrated into the qualitative synthesis. See figure 1 for an overview of the procedure. One study (Seear & Vella-Brodrick, 2013) was part of another study (Odou & Vella-Brodrick, 2013) and used the same participants. This study was therefore excluded.

Studies that aimed to influence behavior without explaining which underlying process was applied to change behavior were excluded. Behavior can be altered by manipulating other variables such as optimism (Cannella, 2006). Therefore, it was chosen to include studies in which behavior was influenced by other assessed variables. An example is the study by Murru and Martin Ginis (2010). They assessed the effects of the BPS-intervention on exercise

behavior with self-regulatory efficacy as the explaining factor. In this review behavior will not be listed as an outcome, but the underlying factor.

Studies in which the possible selves theory has been used as a method to assess other interventions were also excluded. Some studies used assessment strategies based on the possible selves to determine if an intervention has an influence on the participants. This is related to the possibility to use the possible selves as an evaluation method, as they are most likely to change when aspects are adjusted in the present self-concept (Markus & Nurius, 1986). One example for such a study is the one by Lithopoulos, Rathwell, and Young (2015), which was therefore excluded. They studied how an online message intervention that is pointing out benefits of doing sports activates possible sports selves.

In some studies, the possible selves were used as a method to get a better understanding of the possible selves' theory and as a preparation to develop interventions based on this theory. As a consequence, no possible selves' intervention was used. One example of such a study is by Marshall, Young, Domene, and Zaidman-Zait (2008). They considered how possible selves are changing in a conversation about possible career choices of the participants. Such articles were also excluded.

Studies in which there was a possible selves-intervention with different components were also excluded. The outcomes of these studies show how effective the intervention with both the best possible selves and the feared selves is. Therefore, it is impossible to draw a conclusion about the effect of the best possible self-component of the intervention. Day et al. (1994) and Kaylor and Flores (2007) used the possible selves intervention in their studies and were therefore excluded. In total, eight studies were excluded because of this criterion. Included were studies in which components of the possible selves-intervention were the experimental groups and therefore assessed individually. An example for that is the study by Murru and Martin Ginis (2010). The participants were assigned to two experimental groups and one control group. One experimental group did the feared possible selves-intervention, while the other did the ideal selves-intervention. Therefore, the ideal selves-intervention is assessed individually and shows the effects of the BPS-intervention.

A borderline-study was conducted by Hanssen, Peters, Vlaeyen, Meevissen, and Vancleef (2013). They used the BPS-intervention to implement a state of optimism in participants, and then compared the optimism state with a control group in pain sensitivity. Because they measured if the BPS-intervention conducts optimism, the research can be included in this review.

In further analysis, the conditions in which the BPS-intervention was implemented are listed. In another table the different outcomes of the studies are to be seen. It can also be seen if the studies found significant interaction effects, time effects or effects on the follow-up measures. In this systematic review an outcome was defined as significant when $p < 0.05$. In the next step, the conditions were compared. Accordingly, the outcomes that changed significantly and the outcomes that did not change significantly were counted per condition. A study was counted as often as it had investigated outcomes. For example, if one article had three outcomes that were intended to be influenced by the BPS-intervention, it was recorded three times. If it had two outcomes improving significantly and one not significantly, it was counted twice among the significant group and once to the non-significant group. Percentages were used to compare the conditions in significant changes in the outcomes. If the percentages differed by 20% and higher., there was a clear difference stated between the conditions. The discrepancy was described as a “trend towards a difference” when it was greater than 15% but lower than 20%. A difference less than 15% is not stated as a clear difference.

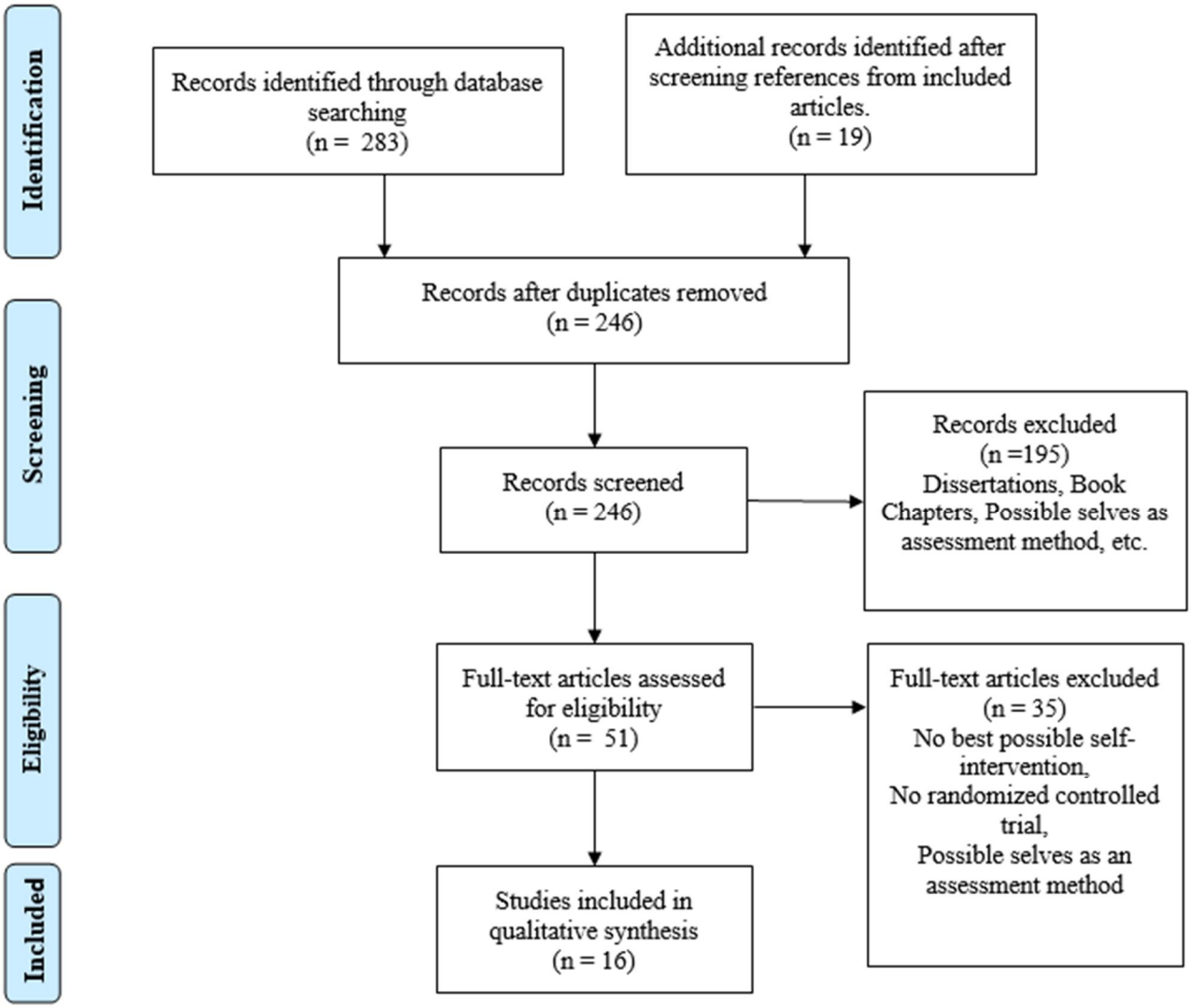

Figure 1. Flowchart Identification of Researches. (Moher, Liberati, Tetzlaff, Altman, & Group., 2009)

Results

16 studies (Boehm, Lyubomirsky, & Sheldon, 2011; Hanssen et al., 2013; King, 2001; Layous, Nelson, & Lyubomirsky, 2013; Liau et al., 2016; Lopes, da Palma, Garcia, & Gomes, 2016; Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011; Manthey, Vehreschild, & Renner, 2016; Meevissen, Peters, & Alberts, 2011; Murru & Martin Ginis, 2010; Odou & Vella-Brodrick, 2013; Owens & Patterson, 2013; Peters et al., 2010; Peters, Meevissen, & Hanssen, 2013; Shapira & Mongrain, 2010; Sheldon & Lyubomirsky, 2006) were identified to fit the criteria for this systematic literature review.

All in all, the studies had 3151 participants, with 742 males and 2407 females. Three participants did not report their gender. The studies included predominantly more female participation than males. In only three of the 16 studies, the genders were nearly equally represented with respectively 53%, 57%, and 52% females.

Conditions

To answer research question one, the conditions in which the BPS-intervention was given, are displayed in table 1. The main descriptive of the participants will be given and how the intervention is implemented.

The participants in eight studies were students, in five of these studies the participants were further described as psychology or social science students. In additional seven studies the individuals were students and workers, within these, four studies described the participants mainly as students, in one study mainly as employees and in two other studies without annotation. One study involved only schoolchildren. In the current review, the participants were divided into "students", "students and workers" and "schoolchildren" to find the main differences between age groups. The mean age of the participants varied from 7.35 to 35.62, with the lowest mean age being an outlier. The next older mean age was 17.83. To compare the age groups with each other, it was chosen to split the groups as followed: younger than 21 years old, 21 to 30 and older than 30 years.

The BPS-intervention can be implemented in a variety of ways. The most adapted manner of implementing the best possible self-intervention is from King (2001). The instructions are as followed:

"Think about your life in the future. Imagine that everything has gone as well as it possibly could. You have worked hard and succeeded at accomplishing all of your life goals. Think of

this as the realization of all of your life dreams. Now, write about what you imagined" (p. 801).

A similar version of the instruction above is used in various studies. Some of the studies added a timespan of for example 5-10 years in which the participants had to think about their future life. There are two prominent versions of instructing the BPS-intervention. Participants either had to think about their ideal life in the future, or they had to think about their ideal life categorized in domains like family, career, social life or physical activity. The participants with the ideal life instruction were free in their description of how their ideal life would look like. The participants, that followed the life-domain instruction, had more help to think about what they could write but were also more restrained. Eight studies implemented the intervention with the ideal life instruction and eight studies implemented the instruction with the life domains. One study asked the participant to think about their ideal exercise life with the according activity level. This study was assigned to the life domain group because the participants were asked to only think about one domain in life.

Another main difference in the implementation of the BPS-intervention is, that the participants exclusively had to write during the intervention or that the researchers added a mental imagery exercise to the intervention. One example of the instructions of the mental imagery exercise from Peters et al. (2010) goes as followed:

"Please, finish your sentences. The time for writing is over. Now, I want you to imagine as vividly as possible the things you have been writing about. Think about your best possible self … in your life for 5 minutes. Imagine your ideal future life … with as much detail as you can. I will tell you when it is time to stop. Please, start thinking" (p. 206).

Nine studies implemented the intervention as an exclusive writing exercise and six studies added a mental imagery exercise. The study from Owens and Patterson (2013) had to implement the intervention in a different way since their study only involved schoolchildren. The schoolchildren had to draw a picture from their ideal life and explain to the supervisor what they had drawn. This intervention was assigned to the writing and mental imagery group for the reason that drawing a picture could function similarly to the mental imagery exercise, where the child imagines himself in the ideal situation. Describing the picture to the supervisor could be interpreted similarly to the writing exercise.

Another difference between the studies was the variety in the intensity of the intervention. Six studies implemented the intervention more than twice a week for one or two weeks. In further

analyses, this group will be referred to as "> twice a week for one or two weeks". Seven other studies had a time span from four to eight weeks and implemented the intervention only one or two times a week. In further comparison will be referred to this group as "≤ twice a week for four to eight weeks". The study by Sheldon and Lyubomirsky (2006) only suggested their participants do the exercise more than twice a week. This study was added to the group "≤ twice a week for four to eight weeks". Three studies implemented the intervention once. The participants in the study from Murru and Martin Ginis (2010) did the writing exercise once and then received an e-mail as a reminder every day for two weeks. Both studies were assigned to the group "Once" because the actual intervention was implemented one time.

The results can be seen in table 1. In conclusion, it can be said that the conditions, in which the BPS-intervention was implemented were about the participants and how the intervention was presented. First, the included studies described the participants' occupation and the age as features of the participants. The occupation of the participants are students, students and workers, and schoolchildren. Furthermore, the age of the participants is an important feature and is divided into <21, 21-30 and >30. Second, the different ways of implementing the intervention were differentiated. The intervention was implemented online or in-person, with the various intensities like once, more than twice for one or two weeks, and twice or fewer a week for as long as up to eight weeks, with the ideal self or life domains instructions, and only as a writing exercise, or also with a mental imagery exercise.

Table 1
Description of the participants and the intervention.

	Participants			Intervention		
Liau et al. (2016)	Students, Singapore	16 – 23 M=17.83 SD=1.12	40 m 122 f	In-person	2 month 1x month 20 min	Imagining, then writing, Ideal life
Boehm et al. (2011)	Community-dwelling individuals, American	20-71 M=35.62 SD=11.36	104 m 116 f	Online	6 weeks 1x week 6 minutes	Imagining, then writing, Life domains
Hanssen et al. (2013)	Students, Dutch	18 – 35 M= 22.95 SD= 2.86	15 m 64 f	In-person	1 week 1x week 20 min	Imagining, then writing, then mental imagery, Ideal life
King (2001)	Psychology Students, American	18 - 42 M=21.04 SD = 3.15	14 m 69 f 2 not reported	In-person	1 week 4x week 20 min	Imagining, then writing, Ideal life
Layous et al. (2013)	Psychology Students, American	18 – 28 M=19.10 SD = 1.77	37 m 94 f	Online/In-person	4 weeks 1x week 15 minutes	Imagining, then writing BPS, then writing about one goal, Life domains

	Participants			Intervention		
Lopes et al. (2016)	Social Science Students, Portugal	M= 28.4 SD = 9.2	27m 35 f	In-person	1 week 5x week 20 minutes	Imagining, then writing, Ideal life
Lyubomirsky et al. (2011)	Students, America	18 - 46 M=19.66 SD= 2.91	95 m 235 f	In-person	8 weeks 1x week 15 minutes	Imagining, then writing, Life domains
Manthey et al. (2016)	Mainly Students and Employees, German	18 - 63 M=33.7 SD=9.6	69 m 366 f	Online	8 weeks 1x week No time limit	Imagining, then writing, Life domains
Meevissen et al. (2011)	Mainly students, Dutch	18 – 43 M= 23.5, SD= 6.36	4 m 50 f	In-person	2 weeks 7x week 5 minutes	Imagining, then 1x writing, then mental imagery every day, Life domains
Murru and Martin Ginis (2010)	Mainly students, Canada	18 – 33 M= 21.29 SD= 3.23	30m 80f	In-person	2 weeks 1x writing 7x week reminder	Imagining, then 1x writing exercise about the ideal exercising person participants want to be. Every day a reminder per E-mail. Life domains
Odou and Vella-Brodrick (2013)	Mainly employees and students, Australian	18 – 74 M= 34 SD=13.99	52 m 157 f 1 n.r.	Online	1 week 7x week No time limit	Mental imagery, then writing about one life domain each day, Life domains
Owens and Patterson (2013)	Children Summer camp, after school program, American	5 – 11 M= 7.35 SD= 1.73	30 m 32 f	In-person	4/6 weeks 1x week 3-10 children per group	Drawing picture and describing it, Ideal life
Peters et al. (2010)	Psychology students, Sweden	21–50 M=29.6 SD= na	31 m 51 f	In-person	1 week 1x week 20 min	Imagining, then writing, then mental imagery Ideal life
Peters et al. (2013)	Mainly students, Dutch	18 - 65 M= 22.8 SD= na	13 m 69 f	In-person	1 week 7x week 5 min	Imagining (3 domains), then writing, 2 achievement statements for each domain, then mental imagery for one statement. (every day a new statement), Life domains
Shapira and Mongrain (2010)	Community-dwelling individuals, Canadian	18 – 72 M=34 SD= na	164 m 817 f	Online	1 week 7x week	Imagining, then writing (also compassionate advice), Ideal life
Sheldon and Lyubomirsky (2006)	Psychology students, American	na M= na SD=na	17 m 50 f	In-person	4 weeks >2x week (suggestion)	Imagining, then 1x writing, then mental imagery, Ideal life

Outcomes

To answer research question two, the primary outcomes of the studies with the best possible self-intervention will be shown and explained. "On which outcomes does the best possible self-intervention have an effect?" In table 2 to 6 the amount of studies is shown that intended to alter each outcome. It is also shown which studies found a significant interaction effect and which studies found a time effect in the experimental condition. In the following, the results will be explained per outcome.

Positive affect: There are 12 studies identified, that intended to change positive affect with the BPS-intervention. Eight of these studies found a significant difference between the experimental and control condition over time. However, one of these studies (Meevissen et al., 2011) could only find a time-effect in the control condition, but not in the experimental condition. The participants positive affect decreased in the control condition to such an extent that it seems as if the BPS-intervention increased the positive affect. Therefore, it can be said, that in out of 12 studies, the intervention increased positive affect over time in comparison to the control condition.

A significant time effect was found in the experimental condition in eight of 11 studies that describe this outcome. Lopes et al. (2016) did find an increase of positive affect over time in the best possible self-condition, although they could not find a difference between the conditions over time. An explanation for this can be that they used the lottery question, which is another positive psychology intervention, as a control condition. Additionally, Liau et al. (2016) could not find an interaction effect, but found that positive affect decreases over time in the best possible self-condition. Five studies also describe the follow-up results. Three of these studies found significant differences in positive affect between the control and experimental condition.

Table 2
Best possible self-intervention compared to control condition in Randomized Controlled Trials (n=16) for positive affect..

	Study design		Outcomes		Results		
					Interaction	Time	Follow-up
Hanssen et al. (2013)	Ne= 40 Nc= 39	Writing about a typical day	Well-being Positive affect	MOOD-pos	+	+	0
King (2001)	Ne= 63 Nc=16	Write about plans for the next day,	Well-being,	Affect-Adjective Scale	+	0	0

		Writing about a traumatic experience	Positive affect				
Layous et al. (2013)	Ne: 81 Nc: 38	Thinking about and making a list of activities from the last 24h.	Well-being Positive affect	Affect-Adjective Scale	+	+	0
Liau et al. (2016)	Ne: 81 Nc: 81	Writing about what happened last week	Well-being Positive affect	PANAS	-	+ (decrease)	0
Manthey et al. (2016)	Ne: 447 Nc: 219 BPS: 222 Gratitude:225	Listing five goals for each week, Gratitude exercise	Well-being Positive affect	SPANE	+	+	+
Meevissen et al. (2011)	Ne= 28 Nc= 26	Thinking about and making a list of activities from the last 24h and imagining it.	Well-being Positive affect	PANAS	+	-	0
Odou and Vella-Brodrick (2013)	Ne= 143 Nc= 67 BPS=73 TGT=70	No activity, Three good things	Well-being, Positive affect	PANAS	-	-	-
Owens and Patterson (2013)	Ne=45 Nc=17 BPS=23 Grateful= 22	Drawing a picture of something they did that day, Gratitude	Well-being Positive affect	PANAS-C	-	-	0
Peters et al. (2010)	Ne= 44 Nc= 38	Writing about a typical day	Well-being Positive affect	PANAS	+	+	0
Shapira and Mongrain (2010)	Ne= 118 Nc= 70 BPS=55 Self-compassion=63 Control=70	Writing about an early memory, Self-compassion letter	Well-being Positive affect	SHI	+	+	+
Sheldon and Lyubomirsky (2006)	Ne= 44 Nc=23 Gratitude= 21 BPS=23 Control= 23	Writing about and giving more attention to life details, Gratitude	Well-being Positive affect	PANAS	+	+	-

Negative affect: Negative affect was intended to be changed in nine studies. Three of these studies found a significant difference over time between the experimental and control condition. All three studies showed a significant decrease of negative affect, as was expected

from the BPS-intervention. Furthermore, seven of eight studies that described the time effect in the best possible self-condition showed that negative affect decreases over time. Only Owens and Patterson (2013) could not find this effect. Four studies did follow-up measures and two of these studies still found significant differences between the control and experimental condition in negative affect.

Table 3
Best possible self-intervention compared to control condition in Randomized Controlled Trials (n=16) for negative affect.

					Results		
	Study design		Outcomes		Interaction	Time	Follow-up
Hanssen et al. (2013)	Ne= 40 Nc= 39	Writing about a typical day	Well-being Negative affect	MOOD-neg	-	0	0
Liau et al. (2016)	Ne: 81 Nc: 81	Writing about what happened last week	Well-being Negative affect	PANAS; CES-D	- -	- +	0 0
Meevissen et al. (2011)	Ne= 28 Nc= 26	Thinking about and making a list of activities from the last 24h and imagining it.	Well-being Negative affect	PANAS	-	+	0
Odou and Vella-Brodrick (2013)	Ne= 143 Nc= 67 BPS=73 TGT=70	No activity, Three good things	Well-being, Negative affect	PANAS	+	+	-
Owens and Patterson (2013)	Ne=45 Nc=17 BPS=23 Grateful= 22	Drawing a picture of something they did that day, Gratitude	Well-being Negative affect	PANAS-C	-	-	0
Peters et al. (2010)	Ne= 44 Nc= 38	Writing about a typical day	Well-being Negative affect	PANAS	-	+	0
Shapira and Mongrain (2010)	Ne= 118 Nc= 70 BPS=55 Self-compassion=63 Control=70	Writing about an early memory, Self-compassion letter	Well-being Negative affect	CES-D	+	+	+
Sheldon and Lyubomirsky (2006)	Ne= 44 Nc=23 Gratitude= 21 BPS=23 Control= 23	Writing about and giving more attention to life details, Gratitude	Well-being Negative affect	PANAS	-	+	-

Satisfaction with life: Eight studies intended to find an effect on satisfaction with life with the BPS-intervention. Only three of these studies found a significant interaction effect. The findings from Manthey et al. (2016) also occurred in the follow-up measures.

Five studies also gave information over the time effect in the best possible self-condition. Four of these studies found that satisfaction with life increases over time in the experimental condition.

Table 4
Best possible self-intervention compared to control condition in Randomized Controlled Trials (n=16) for life satisfaction.

	Study design		Outcomes		Results		
					Interaction	Time	Follow-up
Boehm et al. (2011)	Ne=146 Nc=74 BPS=74, Gratitude=72	List of past week´s experience, Gratitude	Well-being; Satisfaction with life	SWLS	+	+	0
King (2001)	Ne= 63 Nc=16	Write about plans for the next day, Writing about a traumatic experience	Well-being, Satisfaction with life	SWLS	-	0	0
Layous et al. (2013)	Ne: 81 Nc: 38	Thinking about and making a list of activities from the last 24h.	Well-being Satisfaction with life	Need Satisfaction	-	0	0
Liau et al. (2016)	Ne: 81 Nc: 81	Writing about what happened last week	Well-being Satisfaction with life	BMSLSS	-	+	-
Manthey et al. (2016)	Ne: 447 Nc: 219 BPS: 222 Gratitude:225	Listing five goals for each week, Gratitude exercise	Well-being Satisfaction with life	SWLS	+	+	+
Owens and Patterson (2013)	Ne=45 Nc=17 BPS=23 Grateful= 22	Drawing a picture of something they did that day, Gratitude	Well-being Satisfaction with life	BMSLSS	-	-	0
Peters et al. (2013)	Ne= 54 Nc=28 BPS=28 Gratitude= 26	Writing about occurrences in a typical day in the domains: spare time, social domain and professional domain, Gratitude	Well-being Satisfaction with life	SWLS	+	+	-

Optimism: Six studies intended to increase optimism with the BPS-intervention. Five of these studies found a significant interaction effect. Meevissen et al. (2011) found this effect with the Life Orientation Test or Life Orientation Test-revised (Scheier, Carver, & Bridges, 1994) that measured optimism and pessimism. They also used the Subjective Probability task (SPT) (Macleod, Byrne, & Valentine, 1996). With this method, they could see if the participants changed in their positive and negative future expectancies. They found that only the negative future expectancies decreased significantly over time in comparison to the control condition. Over time, without comparing the experimental to the control condition, the positive future expectancies increased, and the negative future expectancies decreased. They also used the Attributional Style Questionnaire that is originally from Seligman, Abramson, Semmel, and von Baeyer (1979) to find out if the participants changed their optimistic explanatory style. The participants did not change significantly over time in comparison to the control condition but did increase the measures of the optimistic explanatory style over time in the experimental condition. Thus, all measures showed changes in optimism over time in the best possible self-condition.

Peters et al. (2010) also used the SPT. They found that not only the positive expectancies did increase and the negative expectancies decrease over time but these changes are also significant in comparison to the control condition. They also used two self-made scales, one that measured positive expectancies for the next week and one that measured positive expectancies in the future. The results on both questions did not differ between the conditions or over time.

Peters et al. (2013) used the LOT-r and the ASQ. Although, with the LOT-r, they found no significant difference between the conditions over time, the results did show an increase in optimism over time. With the ASQ they found a significant difference between the best possible self-condition and the control condition after the intervention and at the follow-up. Furthermore, Liau et al. (2016) with the LOT-r and Hanssen et al. (2013) with the questionnaire for Future Expectations (FEX) that is a modification of the SPT, found effects over time. In the study by Hanssen et al. (2013), the positive future expectancies increased, and the negative future expectancies decreased significantly over time and also in comparison to the control condition. All in all, out of 14 measures that intended to find changes in optimism, eight found a significant interaction effect and eleven found an effect over time. In

further analyses of the outcomes studies will be counted once even if they had more methods of measurement for optimism.

Table 5
Best possible self-intervention compared to control condition in Randomized Controlled Trials (n=16) optimism.

	Study design		Outcomes		Results		Follow-up
					Interaction	Time	
Hanssen et al. (2013)	Ne= 40 Nc= 39	Writing about a typical day	Optimism	FEX-pos FEX-neg	+ +	+ +	0 0
King (2001)	Ne= 63 Nc=16 BPS=19 Trauma= 22 BPS + Trauma= 22 Control= 16	Write about plans for the next day, Writing about a traumatic experience	Optimism	LOT	+	0	0
Liau et al. (2016)	Ne: 81 Nc: 81	Writing about what happened last week	Optimism	LOT-R	-	+	0
Peters et al. (2010)	Ne= 44 Nc= 38	Writing about a typical day	Optimism positive future expectancies	SPT-pos SPT-neg; VAS (next week) VAS (future)	+ + - -	+ + - -	0 0 0 0
Peters et al. (2013)	Ne= 54 Nc=28 BPS=28 Gratitude= 26	Writing about occurrences in a typical day in the domains: spare time, social domain and professional domain, Gratitude	Optimism,	LOT-R ASQ	- +	+ +	- +

Other: Seven studies intended to influence other variables additional to the outcomes positive/negative affect, satisfaction with life and optimism. In the following it will be explained what these outcomes are and if they were increased or decreased significantly.

Four of these studies involved measures similar to the concept of well-being but did not fit entirely into the categories positive affect, negative affect or satisfaction with life. These studies were therefore not added to these outcome categories. Odou and Vella-Brodrick

(2013) measured mental well-being with the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) from Tennant et al. (2007). This scale gives an overview of the affect states, the psychological functioning and the cognitive evaluations in one outcome. Neither did the study find significant differences between the control and experimental condition over time nor did it find an increase or decrease over time in the best possible self-condition.

Lopes et al. (2016) did measure subjective well-being with the Purpose in Life Scale (Ryff, 1989). They found that the scores for purpose in life did not significantly increase in the experimental condition in comparison to the control condition over time. They did find an increase in the scores for purpose in life over time in the best possible self-condition.

Lyubomirsky et al. (2011) also used the Subjective Happiness Scale (SHS) by Lyubomirsky and Lepper (1999). This study was not assigned to the positive affect outcomes because the SHS measures how happy the participants think they are in overall, and not at that precise moment. Lyubormirsky et al. (2011) found that the participants in the experimental condition did not differ from the control condition in how happy they estimate themselves in comparison to peers.

Layous et al. (2013) state, that the BPS-intervention has a direct influence on flow. Flow is defined as a state that occurs when people perform activities which they find enjoyable, meaningful, and which they feel competent doing (Csikszentmihalyi, 2014). This study found that the participants in the best possible self-condition experienced more flow than the participants in the control condition.

Besides measuring positive and negative affect, and satisfaction with life, Owens and Patterson (2013) also explored whether the self-esteem of schoolchildren changed through the BPS-intervention. They found that the schoolchildren had indeed more self-esteem in the BPS-intervention than their counterparts in the control condition.

Murru and Martin Ginis (2010) explored if thinking about the ideal exercise-self as the BPS-intervention had an influence on exercise behavior. They also wanted to find out whether self-efficacy had a role in this potential change. They found that exercise behavior did not increase significantly over time in the experimental condition in comparison to the control condition. However, they found that the exercise behavior increases in the experimental condition over time. They examined change in self-efficacy in the following areas: scheduling, planning, barrier and goal setting. They found that only the scheduling self-efficacy was not significantly different between the experimental and control condition.

Lastly, King (2001) also intended to alter physical illness with the BPS-intervention. She found a significant difference between the control and experimental condition. After the best possible-self intervention, the visits to health centers decreased. This effect remained during the follow-up measures.

Table 6
Best possible self-intervention compared to control condition in Randomized Controlled Trials (n=16) for Other.

	Study design		Outcomes		Results		
					Interaction	Time	Follow-up
King (2001)	Ne= 63 Nc=16	Write about plans for the next day, Writing about a traumatic experience	Illness	Physical illness measure	+	0	+
Layous et al. (2013)	Ne: 81 Nc: 38	Thinking about and making a list of activities from the last 24h.	Flow	Flow	+	+	0
Lopes et al. (2016)	Ne=38 Nc=24	Lottery question	Purpose in Life	PIL (purpose in life)	-	+	-
Lyubomirsky et al. (2011)	Ne=120 Nc=110 BPS= 112 Gratitude = 108,	List activities of last week, Gratitude	Subjective happiness	SHS	-	0	-
Murru and Martin Ginis (2010)	Ne=53 Nc=27 FPS=27 BPS=26	Sportquiz, Feared possible self	Exercise behavior, Scheduling self-efficacy, Planning self-efficacy, Barrier self-efficacy, Goal-setting self-efficacy	Log-book (minutes of exercise) 11-point response scale	- - + + +	+ 0 0 0 0	0 0
Odou and Vella-Brodrick (2013)	Ne= 143 Nc= 67 BPS=73 TGT=70	No activity, Three good things	Mental well-being,	WEMWBS	-	-	-
Owens and Patterson (2013)	Ne=45 Nc=17 BPS=23 Grateful= 22	Drawing a picture of something they did that day, Gratitude	Self-esteem	Perceived Competence Scale for Children	+	+	0

To give a clearer view of how many studies found significant or insignificant interaction and time effects, the number of studies can be viewed per outcome in table 7. The answer to the third research question is as followed. It can be said that optimism and positive affect increased effectively in most of the studies. The increase in satisfaction with life and the decrease in negative affect were found in fewer studies than the first two outcomes. Thus it can be said, that these outcomes cannot be changed as efficiently as the first two. In the studies, the BPS-intervention modified the following outcomes in some studies: flow, self-esteem and some facets of self-efficacy. In one study it was also found that participants have less physical illnesses in the long-term. The concept of mental well-being was investigated in one study, it failed to be changed significantly by the BPS-intervention. It can also be seen that every outcome could be modified significantly over time, when not compared to the control condition.

Table 7
Quantity and percentages of significant and not significant studies with a condition or time effect per outcome.

	N (100%)	Interaction effect	Not significant	N (100%) time	Time effect	Not significant
Positive affect	12	7 (58.33)	5 (41.66)	11	8 (72.7)	3 (27.3)
Negative affect	9	3 (33.3)	6 (66.7)	8	7 (87.5)	1 (12.5)
Satisfaction with life	8	3 (37.5)	5 (62.5)	5	4 (80)	1 (20)
Optimism	6	5 (83.3)	1 (16.7)	5	5 (100)	0 (0)
Other	7	4 (57.1)	3 (42.9)	5	4 (80)	1 (20)
N	42	23 (54.8)	19 (45.2)	34	28 (82.4)	6 (17.6)

Note: Meevissen et al. (2011) found no time effect in the best possible self-condition. Therefore, the control condition decreased in positive affect to such an extent that an interaction effect occurred. This study was added to “not significant”.
Note: Liau et al. (2016) were the only ones that found a decrease in positive affect over time.

Effective conditions

As can be seen in table 2 to 6, most included studies did intend to change more than one outcome. Some outcomes did significantly improve and some did not. To answer research question three, first, the studies will be grouped as "significant $p < 0.05$" and “not significant $p > 0.05$”. With the approach explained in the method section it is accounted for the fact, that not every outcome can be changed equally in the same conditions. In table 8, it can be seen how many significant and non-significant studies there were in the conditions.

Participants: In table 8 can be seen, that more of the significantly changed outcomes were in the group with participants with workers and students. The students and the schoolchildren have less significantly changed outcomes than the students and workers. Also, the condition with only schoolchildren less significantly changed outcomes than the condition with only students. The age group older than 30 had more significantly changed outcomes than the group with a participants' age under 21. The group older than 30 showed regarding percentage a trend towards more studies with significantly changed outcomes than the group with the participants from the age 21 to 30.

Intervention: The condition in which the studies implemented the BPS-intervention online had more studies in which the outcomes are changed significantly than the condition did in which the intervention is given in person.

Thus it can be said that the group that implemented the intervention less than twice a week for four to eight weeks has fewer studies with significantly changed outcomes than the group that implemented the intervention once. The group that implemented the intervention more than twice a week for up to two weeks had more studies in which the outcomes were changed significantly than the group that applied the intervention two times or less on a weekly basis for up to eight weeks.

The condition in which the BPS-intervention was implemented with life domains found a trend toward more studies with significantly changed outcomes than the "ideal life" condition. There was no difference found between the condition where the BPS-intervention was implemented with only a writing exercise and the condition that applied the BPS-intervention with a writing-exercise and mental imagery exercise(s).

After comparing the significantly and insignificantly changed outcomes between conditions, the following conditions seemed to provide the most significantly changed outcomes. In the conditions that include the features of the participants, the group with students and workers combined had the most studies with significantly altered outcomes. Furthermore, when the participants were older than 30, the best-possible self-intervention seemed to work best.

The conditions with the features of the BPS-intervention that included the most outcomes that did increase or decrease significantly were the following: Online appeared to be a better way to implement the study than in-person. The condition with the studies that implemented the intervention once had more significantly changed outcomes than condition in which the studies applied the intervention less than twice for up to eight weeks. The condition with the

studies that implemented the intervention nearly every day showed a trend to have more significantly altered outcomes than the condition with the study that implemented the intervention every week for up to eight weeks. There seems to be a trend towards more significantly changed outcomes in the condition that instructed the BPS-intervention with the life domains than the condition that directed the participants to write about their ideal life. Furthermore, there was no difference found between the conditions when the intervention was with or without a mental imagery exercise.

Table 8
Quantity and percentages of significant and non-significant studies per outcome in the conditions.

	Significant $p < 0.05$	Not significant $p > 0.05$	N (100%)
	22 (54.8)	20 (45.2)	42
Students	10 (43.5)	13 (36.5)	23
Students and workers	11 (73.3)	4 (26.7)	15
Schoolchildren	1 (25)	3 (75)	4
< 21	3 (39)	10 (76.9)	13
21-30	11 (61.1)	7 (38.9)	18
>30	7 (77.8)	2 (22.2)	9
na	1 (50)	1 (50)	2
Online	7 (77.8)	2 (22.2)	9
In person	13 (43.3)	17 (56.7)	30
na	2 (66.7)	1 (33.3)	3
Once	5 (71.4)	2 (28.6)	7
>twice a week for one or two weeks	9 (56.3)	7 (43.7)	16
≤ twice a week for four to eight weeks	8 (42.1)	11 (57.9)	19
Ideal life	11 (45.8)	13 (54.2)	24
Life domains	11 (61.1)	7 (38.9)	18
Writing and Mental Imagery	10 (50)	10 (50)	20
Writing	12 (54.5)	10 (45.5)	22

Note: The outcome positive affect from Meevissen et al. (2011) was added to not significant for the reason that the significant interaction effect occurred because of a time effect in the control condition.
Note: The outcomes from Layous et al. (2013) were not integrated with the condition Online/In-person because they implemented the study in one online condition and one in-person condition.
Note: Sheldon and Lyubomirsky (2006) did not give any indications of the mean age of the participants and their two outcomes were therefore not integrated into the age conditions.

Conclusions and Discussion

To get a first insight of the effectivity of the best possible self-intervention and in which circumstances it is most effective, 16 studies were analyzed and the results summarized. In the following, the research questions will be answered. Afterwards, the results will be discussed.

To answer research question one, the conditions in which the intervention is implemented are given. The conditions regard the features of participants and how the intervention was presented. The participants' features were defined as their occupation and their age. Occupation of the participants were students and workers, only students, and schoolchildren. The age of the participants was divided into three groups: “< 21”, “21-30”, and “> 30”. The manners of implementation were either online or in-person, with the various intensities like once, more than twice for one or two weeks and two times, or fewer in a week for as long as up to eight weeks. Furthermore, the intervention was applied with either the ideal life or domain-specific instructions and with or as a writing exercise with or without a mental imagery exercise.

Delivering an answer to research question two about which outcomes were intended to change by the BPS-intervention, this systematic literature review found, from changed in most studies significantly to fewest studies: optimism, positive affect, satisfaction with life and negative affect. The outcomes grouped under "Other", each investigated by just one study, showed that the outcomes flow, self-esteem and some facets of self-efficacy seem to be significantly changed. Furthermore, physical illness seemed to be less present, indicated by the decreasing visits to health centers after a longer period of practicing the BPS-intervention. The intervention did not appear to change the outcomes mental well-being, subjective happiness, and purpose in life significantly. It could also be observed that nearly every outcome changed significantly over time, when not compared to the control condition.

Moreover, research question three will be answered: “In which conditions, does the BPS-intervention have most effects?”. The group with participants that were students and workers had the most studies with significantly changed outcomes. Furthermore, when the participants were older than 30, the best-possible self-intervention seemed to work better than in the studies with participants younger than 21 and showed a trend to work better than the group with participants between 21 and 30 years old. Online seemed to be a better way to implement the study than in-person. The condition with the studies that implemented the intervention

once had more significantly changed outcomes than the studies that applied the intervention “less than twice a week for four to eight weeks”. "More than twice a week for one or two weeks" showed a trend to having more significantly altered outcomes than the condition with the study that implemented the intervention less than twice a week for four to eight weeks. Moreover, there seems to be a trend towards more significantly changed outcomes in the condition where the participants were instructed with the life domains than the condition that directed the participants to write about their ideal life. There was no difference found between the conditions with or without a mental imagery exercise. In the following, first the outcomes and then the conditions will be discussed.

The outcome that significantly increased in most studies was optimism. This finding is in line with the meta-analyses of Malouff and Schutte (2016), mentioned in the introduction. Optimism was measured by instruments that aim for two crucially different interpretations of optimism. Optimism as an explanatory style and as a personality trait. Two studies used the attribution style questionnaire to find changes in the optimistic explanatory style of the participants. One found significant changes over time between the experimental and control condition and the other found changes over time. It can be assumed that thinking about goals and how one wants to be, may also point out personality traits which a person wants to change. In the introduction of the BPS-intervention, it is sometimes mentioned that all problems are solved and wishes fulfilled with hard work from the participant. The participants could notice by imagining how they want to be and what to overcome that reasons for negative events do not need to be permanent or global and that they can change by investing in analyzing behavior and motives.

The reason for the increase in optimism as a personality trait could be laying in the expectancy-value model of motivation as mentioned in the introduction (Carver & Scheier, 2001). Imagining the ideal life and what has to change until then can evoke states of increased confidence for positive outcomes as the actual behavior towards that ideal life (Carver & Scheier, 2001). Positive affect is another outcome that was increased significantly in most of the studies. A first step in experiencing more positive affect can implement an upwards spiral of positive affect. The broaden and build theory from Fredrickson (2001) states that positive emotions, as joy, interest, and contentment have a broadening effect on people´s thought-action repertoires and build personal resources over time, such as social, psychological, intellectual and physical resources. Fredrickson and Joiner (2002) state that experiencing positive affect also increases coping mechanisms and uphold and support new positive

emotions and therefore well-being. This upwards spiral could promote the experience of new steps towards a goal, because the participants see the increase in their well-being and the broadening of their resources. The steps towards the goal following the expectancy-value model of motivation mentioned earlier increases optimism and again, positive affect (Carver & Scheier, 2001). Liau et al. (2016) also found that positive affect correlates with findings in optimism and can give therefore partly proof to this point.

Positive affect can also be increased through a state of flow implemented by the BPS-intervention as stated by Layous et al. (2013). In this state, participants experience fulfillment and competence because their capabilities are matching the activity they are doing (Csikszentmihalyi, 2014). The BPS-intervention is an appealing practice and comes naturally to most of the participants because they have to write about themselves in the future in the most positive way and they are the experts in this manner. Csikszentmihalyi and Hunter (2003) found that people who participate in activities that promote a state of flow are experiencing more happiness. In conclusion, positive affect and optimism can be significantly increased by the BPS-intervention through partly the same mechanisms.

Liau et al. (2016) also found that negative affect was associated with changes in life satisfaction. In this review it was found that both of these outcomes have fewer studies with significantly improved outcomes than positive affect and optimism. One reason for that could be that the BPS-intervention focusses on the positive aspects of life and speaks therefore to positive emotions rather than negative. McElwee and Haugh (2010) used the possible selves-intervention rather than the BPS-intervention and found that thinking clearly about the future can decrease negative affect. Most studies included in this review did not recommend the ideal life to be realistic. Thus, the imagined future could be less clear to the participants. Including the feared for possible self could give a clearer and more realistic view of the future self and change negative affect which is associated with the feared for possible self. The aim of such an intervention should be that the participants see their worries that promote negative affect and also what could overcome them. With this approach, they find the balance with the hoped-for possible self that sets the right way to avoid the fears (McElwee & Haugh, 2010).

A few studies, on the other hand, found a great decrease in negative affect. For example, Seear and Vella-Brodrick (2013), who used the same participants as the study from Odou and Vella-Brodrick (2013). Their participants reported a higher than average level of negative affect to start with. They conclude that this measure of outcome had the greatest opportunity to change. In the majority of the studies included in this systematic review, the participants

had prior the intervention average negative affect scores and could not have as much opportunity to improve as the participants in the study by Seear and Vella-Bodericks (2013).

Only 37% of the outcomes concerning satisfaction in life were significantly changed by the possible self-intervention. One reason for why the BPS-intervention failed to have a significant effect on this outcome, could come from the study from Vazeou-Nieuwenhuis, Orehek, and Scheier (2017). They investigated whether pursuing goals, especially the assessment and the physically pursuing or locomotion of them is associated with the purpose of life and life satisfaction. Their results show that changes in the purpose of life mediated the link between assessing goals and lower life satisfaction, and it mediated the connection between physically pursuing the goals and higher life satisfaction. For the BPS-intervention, this could mean, that writing and imagining the ideal life with all the goals reached, equals the assessment of the goals, and is therefore linked to lower life satisfaction (Vazeou-Nieuwenhuis et al. 2017). Additionally, satisfaction in life could also not be influenced significantly because it is linked to a range of personality traits, which are difficult to change. In a meta-analysis from DeNeve and Cooper (1998) is for example found that satisfaction with life has a negative correlation with neuroticism. This means if participants score already high in neuroticism they will have low satisfaction with life and will not change in this personality trait. Further, it will be explained in which circumstances the BPS-intervention works most effectively.

In this review, the features of the participants that had most benefitted from the intervention are older than 30. The group younger than 21 contained the fewest studies with significantly changed outcomes. The findings in the occupations mirror this result, considering that the participants in the students and workers-condition are of more advanced age than the students. These findings are in line with the results of the meta-analyses from Sin and Lyubomirsky (2009), who found that positive psychology interventions are more effective with advanced age.

Following the socioemotional selectivity theory from Charles, et al. (2003), which was mentioned in the introduction, it is plausible that adults in their mid-thirties have a clearer view on what their goals are and what they want to accomplish in the next five to ten years. Their goals are also related to finding more emotional meaningfulness, which could give greater meaning to the BPS-intervention (Charles et al., 2003). When imagining their ideal selves, people experience the affective state that is associated with this ideal self (Markus & Nurius, 1986). Accordingly, older participants can experience a more positive affective state

in comparison to students, because students are possibly not associating goals in obtaining information to strong positive emotions. Although the mean age difference between the groups in this review is not large the oldest group could already benefit from the positivity bias. In most studies, the participants were instructed to think about themselves 5-10 years from their current age. The participants older than 30 could apply the positivity bias which is found in participants with advanced age as mentioned in the study of Charles et al. (2003) and process emotional information more active than younger participants.

It is also important to consider the circumstances in which the participants apply the BPS-intervention. Since the future possible selves are a powerful evaluation method, it could be substantial, which circumstance a younger participant experienced before the intervention (Markus & Nurius, 1986). Older adults could be in a more secured position in which setbacks do not fundamentally influence the view of themselves and the goals they want to accomplish. Almeida (1998) supports this argument with his statement that younger adults rated their distress experience in the past week on the premise of their most stressful day, whereas older adults were less influenced by a single displeasing event. Also, well-being decreases in college students throughout the semester (Brissette, Scheier, & Carver, 2002). The intervention is possibly not powerful enough to increase well-being in college students but can uphold their well-being at an average level considering the circumstances (Sheldon & Lyubomirsky, 2006). Sheldon and Lyubomirsky (2006), also argue that the BPS-intervention can improve resilience in college students.

In conclusion it can be said, that the intervention is more effective in participants with advanced age, who are more settled in their goals and have safe circumstances in their life. Earlier was argued that the intervention works best for whose goals are more related to emotions. It could be interesting for further research to get a clearer view of the person-intervention fit and also of the influence the positivity bias has on the outcome. The BPS-intervention could be implemented without a predefined time-frame from five to ten years. The participants should decide prior the intervention in which age-group they imagine their ideal life. Based on the earlier argumentation it then could be expected that the participants who choose the age-group older than 60 benefit the most from the BPS-intervention. As Charles et al. (2003) argued, the positivity bias is most present in this age group and could be used to increase well-being in participants at a younger age as they take the perspective of this age group. For a better person-activity fit for college students, further research could investigate whether students with a clear professional goal benefit more when the BPS-

intervention contains the domain-specific instruction. Seear and Vella-Brodrick (2013) argue that the BPS-intervention could be most beneficial for college students who are aiming for a professional career. This is just one aspect of an ideal future life, and it is possible that students can imagine that easier than the wished-for family or housing situation. In the following, it will be discussed how the intervention should be implemented to be most efficient.

In the results of the meta-analysis by Bolier et al. (2013) is recommended that positive psychology interventions should be carried out over a longer period. The findings in this systematic literature review could not directly translate this finding to the BPS-intervention. In this review it was found that engaging once in the BPS-intervention seems to be more effective than implementing it once a week over a longer period. The reason for this could be that engaging in such activities too frequently results in adapting to it. This could lead to a decrease in effect (Lyubomirsky et al., 2005). This argument must be considered with caution because most of the studies that implemented the intervention once found a significant effect only immediately after, and rarely in the follow-up measures.

So what is the ideal frequency of engaging in the BPS-intervention? The results of this review revealed that one particular frequency does not have to work for every group of participants. Sheldon and Lyubomirsky (2006) for example, implemented the intervention as one writing exercise followed by one-week imagery exercises, where the participants could choose when and how often they would want to engage in the exercise. They did find great increases in positive affect in participants in the experimental condition. An influential factor is the self-regulation of the participants as was mentioned in the study by Lyubomirsky et al. (2005) about the architecture of sustainable change. Participants should engage in the activities on their free will and plan them whenever they want. Lyubomirsky et al. (2005) argue further that interventions should be repeated weekly for the reason that our cultural routine does. Conclusively, it can be assumed that the BPS-intervention can be used for a one-time immediate large effect on positive affect and a smaller but more sustained effect when repeated frequently and under self-determined circumstances. Aside from knowing when to engage in the best possible self-activity, it is also important to know how.

In contrast to the meta-analyses from Sin and Lyubomirsky (2009), who found that positive psychology interventions best should be implemented in one-on-one formats or groups, this systematic literature review found more studies with significantly changed outcomes when the intervention was implemented online. An explanation could be, as mentioned above, that

participants can choose when to engage in the intervention and therefore experience a high level of self-regulation as referred to in the architecture of sustainable change (Lyubomirsky et al., 2005). When participants engage in a self-administered intervention, they can count their increase in well-being as their own achievement and not to the efforts of a therapist (Mitchell, Vella-Broderick, & Klein, 2011). In conclusion, it can be said that the frequency of the intervention should be determined by every participant individually, which works best with an online format. In the following, it will be further discussed how to implement the intervention.

The findings in this review were also not in line with the expectations prior the review, that the interventions including mental imagery exercises should have significantly changed outcomes more often. A reason that no difference is found between the writing exercise with and without mental imagery could be, that before the participants engaged in the writing exercise and the mental imagery exercise, they were given time to imagine their ideal lives before the writing exercise. Even for a short time, in combination with the writing exercise the imagining could result in the same effect as the mental imagery exercise. Mentally imagining the ideal self, can give a sense of self-regulation and indicate steps in the right direction as mentioned in the introduction.

Furthermore, the review shows a trend towards more studies in the life domains condition. Accordingly, it is plausible that writing about life domains is moderately more effective than writing globally about the ideal life. Imagining a scenario in a life domain as "family" gives a clear limit whereas imagining the ideal life gives no specific indication what to imagine. It is therefore not given that the imagined ideal life is reachable and realistic. When argued that a positive outcome is reached when experiencing the steps towards the ideal life and a clear goal with the intervention, this effect is limited when the participants imagine unrealistic ideal lives. Moreover, instructions of the BPS-intervention that offer limits and suggestions give a clear challenge level (Csikszentmihalyi, 1997), and the chance that participants experience the state of flow and ergo more happiness can increase (Layous et al., 2013). Another reason could be that participants are likely to benefit more when they have more variation in the exercise. In the study by Schueller and Parks (2012), the participants did experience more benefit from positive exercises when they did two or four different activities in a timespan. The life domain instruction could give the participants a more variable intervention which could prevent the participants from adapting to the activity and dampening of the effects.

Limitations and Conclusion: The BPS-intervention is showing promising results in a range of studies. The aim of this review was to get a first impression of when for whom and for what the BPS-intervention works most effectively. The results can provide some first insights but should be interpreted in combination with the limitations.

Only a small number of studies was included in this review. An explanation could be that the used search string did not exhaust all search terms associated with the studies about the intervention. Another indication for this is that some of the articles were found by screening the references of the already included articles that crystallized out of the basic systematic search. The search-term "possible selves" was integrated into the search string to cover the field of the possible self-research. Studies which involved the terms "possible self" or "best possible self" (singular) were therefore not found. A better search term would have been "possible sel*" to include both "possible selves" and "possible self".

Furthermore, only three studies were included that could not find any significant outcome. The reason for this could be that studies are often not published when no effect is found. Through this publication bias, most studies are published with significant results and more treatment success (Song et al., 2010). For this reason, there could be not enough insight into the outcomes that cannot be changed and conditions in which, in this case, the best possible self-intervention, does not increase or decrease outcomes significantly. Throughout the systematic search of the articles, more than twenty dissertations were excluded since they were not published as journal articles. To prevent faulty conclusions due to the publication bias, studies that were not published, such as the dissertations, could be included.

Another limitation of this review is that a definite conclusion cannot be made about the outcomes bundled under the outcome-group Other. Self-efficacy, self-esteem, flow, exercise behavior, mental well-being, subjective happiness, purpose in life and physical illness were each investigated by one study. Further research could focus in particular on these outcomes, to give a clearer conclusion about whether they could be changed effectively with the best possible self-intervention. Also, only a few follow-up measures were explained in detail in the included studies. The majority of studies did not describe the follow-up measures in detail or did not intend to take follow-up measures. For this reason, it is not possible to make a conclusive statement about the effectivity of the best possible self-intervention on the outcomes in the long-term. In the frame of this literature review, it was not feasible to ask the researchers for additional information about the follow-up measures not mentioned in their

articles. For further studies, it is recommended to take the time and collect additional information about follow-up measures.

It is also notable that in this review nearly every study found changes in the outcomes that were intended to be modified over time. This shows that the best possible self-intervention has an impact on the outcomes. A reason for this could be that some studies used activities in the control conditions that can also have an effect on the outcomes intended to be changed by the best possible self-intervention. For example the control activity "giving more attention to life details" comes out of a mindfulness training and is known to decrease depression and other negative outcomes (Khoury et al., 2013). Thus, it is not surprising that some studies did not find an interaction effect. Furthermore, the intervention was implemented in a variety of manners. It was challenging to compromise and find the right fit for some studies in the conditions. For further research, it would be preferable that the researchers find an agreement in the control groups, and also in the best possible self-intervention when investigating different outcomes.

Another limitation is, that the analyses of the conditions in which the best possible self-theory was implemented could give faulty results. For example, could have the group “in-person” more participants whom are younger. The results of these studies could be therefore come forth from the age or the implementation. Further research should also analyze the influence of the conditions separable. This could be accomplished by eliminating all other conditions or analyzing the correlations.

All in all, the results of this systematic literature review give a good indication when and how to use the best possible-self intervention. The results suggest that the best possible self-intervention should be implemented with participants that are somewhat older or more mature and are situated solidly. It does not make a difference if the intervention introduces a mental imagery exercise besides the writing exercise. Asking the participants to write and imagine their ideal life in life domains seems to work better than writing and imagining the ideal life. This review also suggests that the intervention should be practiced once for an immediate boost in positive affect and more than twice for one or two weeks to reach a longer lasting positive effect. Participants should choose the time when and how often to engage in the activity to get a longer lasting effect. The intervention can best be performed by participants who want to increase their optimism in the long term and boost their positive affect immediately. Finally, it can be said that because the best possible self-intervention shows promising results on the outcomes optimism and positive affect, also shows promising effects

over time on nearly every outcome, it is worthwhile to investigate the best possible self-intervention in further research to obtain a better person-activity fit.

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