

Positive psychology interventions: A comparison of the effects of three good things, best possible selves and a control task of early memories on dispositional gratefulness, life satisfaction, positive affect and negative affect

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ABSTRACT

Positive psychology interventions are intentional activities designed to promote positive feelings (Sin & Lyubomirsky, 2009). Different types of interventions have different focuses such as gratitude (Three Good Things) and optimism (Best Possible Selves). However, there are inconsistent findings for which type of intervention is the most effective (Seligman, Steen, Park & Peterson, 2005; Sheldon & Lyubomirsky, 2006b). It is suggested that individual factors may explain this inconsistency, with dispositional gratefulness (predisposition to experience gratitude) being put forward (Chan, 2010). The present study investigated whether type of intervention affected life satisfaction, positive and negative affect, and dispositional gratefulness comparing Three Good Things, Best Possible Selves and a control task of Early Memories. A 3 x 2 mixed design was used with participants randomly allocated to one of the tasks. Forty five participants completed post-intervention measures five days later. Life satisfaction had significantly increased post-intervention in the Best Possible Selves and Early Memories conditions. This study provides further support for the trait of dispositional gratefulness. Future research could investigate whether dispositional gratefulness is a moderator for the effectiveness of gratitude interventions. It is argued that future studies should be adequately powered and a greater clarification is needed regarding definitions for happiness.

KEY WORDS:	POSITIVE PSYCHOLOGY INTERVENTIONS	DISPOSITIONAL GRATEFULNESS	THREE GOOD THINGS	BEST POSSIBLE SELVES	LIFE SATISFACTION
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Introduction

Positive psychology focuses on the good in life such as what influences happiness and flourishing opposed to the traditional approach of psychology steeped in illness ideology, which focuses on trying to fix what is wrong (Seligman & Csikszentmihalyi, 2000). One definition of positive psychology states that it is the scientific study of optimal human functioning (Linley, Joseph, Harrington & Wood, 2006). Martin Seligman is the pioneer of positive psychology with the movement gaining momentum following his inaugural speech as the American Psychological Association President in 1998. Seligman promoted the concept of positive psychology as he felt that psychology as a discipline had only been focusing on curing mental illness and had ignored the potential for improving the lives of everyone with the nurturing of positive traits (Seligman & Csikszentmihalyi, 2000). Positive psychology is an emerging field of psychology with its leading journal, *The Journal of Positive Psychology*, founded in 2006 stating the ambition to integrate into the mainstream in the future (Linley et al., 2006). Whilst academic interest into positivity is quite recent, its origins go further back to the 1940s with humanism and Maslow's concept of self-actualisation, which is the achievement of one's full potential (Maslow, 1943). Areas studied include wellbeing, happiness, flow, personal strengths and creativity looking at individuals and groups. Measuring happiness is increasingly recognised by governmental policy-makers as important for the nation's wellbeing instead of only focusing on income (Forgeard, Jayawickreme, Kern & Seligman, 2011). The pursuit of happiness is widely recognised as a Westernised cultural ideal with the majority of people seeking an increased level of happiness as a life goal (Sheldon & Lyubomirsky, 2006a).

Seligman introduced the authentic happiness theory (2002) which described happiness in three components: the pleasant, the engaged and the meaningful life. The pleasant life means experiencing many positive emotions, the engaged life means being absorbed in activities and the meaningful life means service to something higher than the self (Hefferon & Boniwell, 2011). However, it was argued that this was inadequate as it could not account for people who live to achieve for its own sake (Seligman, 2011). Another issue identified was that happiness means cheerful mood to the majority and engagement and meaning do not correspond with this. This has since been supported by Baumeister, Vohs, Aaker, and Garbinsky (2013) who found that whilst happiness and meaning are correlated they are also distinct, people can be happy but live meaningless lives and vice versa. Seligman has since revised his theory and entitled it authentic wellbeing theory (2011) to account for these limitations. Wellbeing is an overarching construct with the acronym 'PERMA' being used to convey its elements: positive emotion, engagement, relationships, meaning and accomplishment which all contribute to overall wellbeing. The development of the theory is useful as it acknowledges the importance of relationships and individual achievements. The goal of positive psychology is to therefore enhance wellbeing which can be measured by flourishing (Seligman, 2011). Huppert and So (2013) define flourishing as having positive emotions, meaning, and engagement and three of these following features: self-esteem, optimism, resilience, vitality, self-determination and positive relationships. Using this definition they measured rates of flourishing in European countries, the highest rates were seen in Denmark with 40%, and the lowest rates were seen in Portugal with 9%. From these it can be seen there are considerable improvements to be made. To look at achieving Seligman's aim for positive

psychology, for 51% of the world to be flourishing by 2051, an understanding of what individuals can do to improve wellbeing needs to be addressed.

There is an interest in enhancing happiness and wellbeing because of the numerous positive benefits resulting. A review by Lyubomirsky, King and Diener (2005) concludes that happier people, when compared to similar peers, have more stable marriages, stronger immune systems, higher incomes and are more creative. Cause and effect cannot be established in associations so there is a need to be cautious when interpreting the results, as it could be that having a stronger marriage leads to happiness or vice versa. It should also be noted that there could be other mediators such as increased self-efficacy which contribute to both factors. Veenhoven (2008) found that in healthy populations, happiness was a protective factor against becoming ill, however it should be noted that happiness did not have a significant effect on improving health in ill populations. This suggests health is a mediating factor which needs to be taken into account when looking at the benefits of happiness. These benefits can be explained by Fredrickson's broaden-and-build model (2001) which states that positive emotions allow people to have a wider range of thoughts and actions leading to increased skill development compared to negative emotions, such as anxiety, which activate the fight or flight response. This activation makes thinking of anything else difficult as this is the most adaptive for survival. Findings such as these highlight the benefits of investigating how to increase happiness as it has substantial benefits.

The application of research in this field is to investigate whether happiness can be manipulated. It is argued that a large proportion of happiness is genetic and therefore nothing can be done to increase happiness. Lykken and Tellegen (1996) proposed that heritability was 80% based on samples of twins being retested at four and ten years. It is now widely accepted that the genetically determined set-point of happiness is 50% (Lyubomirsky, Sheldon & Schkade, 2005). There is also the issue of hedonic adaptation, which suggests that any changes experienced in happiness levels shortly go back to baseline because people adapt to their circumstances (Brickman and Campbell, 1971, as cited in Lyubomirsky et al., 2005). Brickman, Coates and Janoff-Bulman's (1978) study compared happiness ratings of lottery winners, paraplegics and controls. They found ratings were similar across all groups suggesting people adapt to their situations, as it might be expected that lottery winners would be the happiest based on their circumstances, and challenges the idea that there is something which can be sought to make someone happier. Sheldon and Lyubomirsky (2012) explain hedonic adaptation as positive emotions deriving from positive events becoming less frequent as time passes. The changes become the norm and individuals now develop new aspirations. They put forward the hedonic adaptation prevention model which involves maintaining effort in attending and appreciating the positive change in order to prevent this adaptation occurring and this therefore suggests that changes in happiness are possible. This relates to the model of happiness of Lyubomirsky et al. which recognises the genetic influence of happiness but also says 40% is affected by intentional activity, meaning that a large percentage of happiness can be influenced by engaging in activities such as appreciation. Sheldon and Lyubomirsky (2006a) conclude that activities which aim to increase happiness are effective and effort is required for changes to have a lasting effect. This provides support for the use of activities to increase happiness but there is an awareness that it might not work for everybody, the role of effort is important.

This leads to the development and use of positive psychology interventions (PPIs). Sin and Lyubomirsky (2009) define PPIs as intentional activities which are designed to cultivate positive feelings, behaviours or cognitions. There are many different types of PPI and these come under different categories such as gratitude, optimism and identifying signature strengths. Examples of gratitude tasks include Three Good Things and the Gratitude Visit or Letter. The Gratitude Visit or Letter involves writing a letter to someone expressing gratitude for something the person has done for them and then either handing the letter to them in person (Visit) or posting the letter. The Three Good Things exercise asks participants to write about three things that went well in their day and why this was the case. An example of an optimism task is Best Possible Selves; this involves visualising the self in five years' time at their best in different domains of life and to start to think about how they can work towards these goals now. Sin and Lyubomirsky conducted a meta-analysis of 51 PPI studies, including a range of interventions such as gratitude activities, mindfulness, positive writing and rehearsing positive statements, to examine their effectiveness. They concluded that PPIs enhance wellbeing and alleviate depression. This is a strength as it provides increased support for such interventions to be used and to have confidence in their efficacy. Factors such as age and self-selection were important, in that being older and choosing to participate in these interventions with full knowledge had the best outcomes.

Looking at gratitude specifically, expression of gratitude has been shown to have numerous benefits. Gratitude is defined as a sense of wonder, thankfulness and appreciation for what the person has received (Chan, 2010). Benefits can be seen in many domains such as Wood, Joseph, Lloyd and Atkins (2009) finding that gratitude correlated with improved sleep quality, less time taken to fall asleep and increased sleep duration. Experiencing gratitude has been shown to be associated with positive emotion and wellbeing and this has been suggested to be causal in a review conducted by Emmons and McCullough (2003). This causality can be investigated by manipulating the experience of gratitude through the use of gratitude interventions and seeing if increased happiness is an outcome. A literature review by Wood, Froh and Geraghty (2010) discussed twelve studies which support the positive association between gratitude and positive affect. Wood, Joseph and Maltby (2009) found that gratitude was significantly correlated with life satisfaction and could explain individual differences in this when the Big Five personality characteristics were controlled for. However, these studies cannot make definite conclusions about cause and effect, therefore intervention studies which experimentally manipulate gratitude need to be examined.

Studies which support the use of gratitude interventions include Emmons and McCullough (2003). Their study involved comparing the effects of gratitude listing, hassles listing and a control task of neutral life events. The first study required participants to complete the task once a week for ten weeks and the second study, with new participants, asked them to do their task once a day for two weeks. Overall, they found that gratitude listing had increased benefits such as an increase in positive affect, higher levels of optimism and increased prosocial behaviour compared to the other conditions. An additional finding was that there were greater benefits in the second study suggesting that increased regularity of the intervention is the most beneficial. The use of random assignment to conditions is a strength of this study. As the only difference between the groups is the intervention they received, this increases

confidence in the findings and therefore the success of the gratitude intervention, suggesting that gratitude interventions are beneficial.

Other research has since supported the use of this intervention such as Seligman, Steen, Park and Peterson (2005). They found that the gratitude task of Three Good Things increased happiness and decreased depressive symptoms for individuals with mild depression. This was found to have a long-lasting effect as the intervention only lasted a week and the effects still held at a six month follow-up. They used the Internet to recruit participants using subscribers to a positive psychology website, therefore recruiting people who have an interest in this area. The findings may have been influenced by the participant's expectations as they were actively seeking ways to become happier and therefore it could be that the results are due to expectations not the exercises, similar to the placebo effect. This raises difficulties as researchers cannot coerce uninterested people to take part in research. A potential issue with the follow-up finding is that the researchers noted that participants continued with the exercises over this time frame. This raises the question of whether there are actually any long-term benefits; however it does support the idea that to maintain increased happiness individuals need to continue their appreciation. This supports the use of the gratitude intervention and provides increased support that happiness can be increased despite a set point or hedonic adaptation.

On the other hand there have been conflicting findings in the literature. Sheldon and Lyubomirsky (2006b) conducted a four week intervention study comparing the effects of a gratitude intervention and Best Possible Selves with a control condition of listing life events. They found that the Best Possible Selves task led to a higher level of maintained positive mood and an increased motivation to complete the task beyond the study period. This was measured at baseline and again at two and four week intervals. The sample was all university students which raises issues with generalising the findings to other populations. It could be that it is easier and more fun for students to imagine themselves in the future. However, this needs to be specifically examined to see if there are any differences between different populations. Another potential issue with this study is the use of self-report measures of adherence. Participants may be inaccurate possibly reporting increased adherence as they may feel that this is expected of them. This may limit the validity of the findings, however as there were some changes this suggests people did adhere to the task, though there may be other mediating factors. Whilst this may be problematic, self-report measures are more practical than having a specific time and location to see the participant complete the task, so the benefits outweigh the disadvantages. To extend this study, other aspects of wellbeing could also be measured to see if there were benefits beyond mood. It could be that differing success rates with PPIs could be explained by individual differences. This relates to the Person-Activity Fit Diagnostic (Lyubomirsky, Sheldon & Schkade, 2005) which is a questionnaire ascertaining whether a particular activity would feel natural or forced to determine the most appropriate activity for the individual. This supports the logical idea that different people would prefer different tasks and it would therefore be useful to examine the specific characteristics which influence these preferences.

Dispositional gratefulness is defined by Chan (2010) as a predisposition to experience gratitude. This was conceptualised by McCullough, Emmons and Tsang (2002) who showed that dispositional gratefulness was distinct from other constructs such as life satisfaction and optimism. From this they developed the Gratitude Questionnaire to

measure this trait. It would be interesting to explore, as suggested by Emmons and McCullough (2003), whether dispositional gratefulness is an important individual factor to take into consideration when assigning interventions, to see whether it strengthens or weakens the effect of a gratitude intervention. It could be that a gratitude intervention would be best suited to a grateful individual or it could lead to a case of indebtedness where too much gratitude leaves the individual feeling that they owe something. This relates to Lyubomirsky, Sheldon and Schkade's (2005) Person-Activity Fit Diagnostic as this trait could be a moderator which needs to be considered when assigning interventions. More research needs to be conducted to increase supporting evidence of the existence of dispositional gratefulness. Knowledge in this area can be further developed by conducting a study to investigate whether high or low gratefulness impacts effectiveness of intervention and whether this varies between types of intervention.

Based on conflict in the literature, the aim of the present study was to investigate whether type of intervention (gratitude compared to optimism) would have a significant effect on happiness. Another aim of the study was to examine whether the existence of the trait of dispositional gratefulness is supported by investigating whether there were any changes in this trait post-intervention.

This study compared the Three Good Things and Best Possible Selves interventions to see if there are increased benefits to a particular type of PPI. As the aim of these is to increase happiness this study is therefore focusing on the positive emotion element of the authentic wellbeing theory. This was measured using the domains life satisfaction, which is an evaluative assessment of an individual's life as a whole, and affectivity, amounts of positive and negative affect, as discussed by Baumeister, Vohs, Aaker, and Garbinsky (2013) and in line with previous research such as Sheldon and Lyubomirsky (2012). This was measured using the Life Satisfaction Scale and the Positive and Negative Affect Schedule.

The first hypothesis was there will be a significant difference of Type of Intervention (Three Good Things, Best Possible Selves and Early Memories) on Life Satisfaction, Positive Affect and Negative Affect scores at post-intervention compared to pre-intervention. The second hypothesis was there will not be a significant difference of Type of Intervention (Three Good Things, Best Possible Selves and Early Memories) on Dispositional Gratefulness at post-intervention compared to pre-intervention.

Method

Design

This study used a 3 x 2 design. There were two independent variables: type of intervention (3 levels) and time (2 levels). The type of intervention variable had three levels corresponding to the three different interventions: Three Good Things (gratitude intervention), Best Possible Selves (optimism intervention) and a control task of Early Memories. The type of intervention variable was independent measures and the time variable was repeated measures (pre- post-intervention). There were four dependent variables: dispositional gratefulness, life satisfaction, positive affect and negative affect. The latter three variables relate to the overarching concept of happiness. These were measured using questionnaires, The Gratitude Questionnaire-Six Item Form (McCullough, Emmons & Tsang, 2002) and The Positive and Negative Affect Schedule (Watson, Clark & Tellegen, 1988) and The Satisfaction With Life Scale

(Diener, Emmons, Larsen & Griffin, 1985), respectively. Participants completed a baseline assessment (pre-intervention) and following completion of the intervention task participants completed the assessment again (post-intervention). The option to enter a prize draw was included as an incentive to complete the final part of the study; this was presented to participants at the end of the final set of questionnaires. Participants were given the option to add their email address if they wished to be part of the prize draw. An additional incentive for psychology students was used with the allocation of participation points upon completion of each section of the study.

Participants

A total of 68 participants were recruited and completed the first set of questionnaires. Participants were randomly allocated to conditions using the 'RANDBETWEEN' function on Excel and for the last group of participants this was done sequentially to achieve equal numbers in each group. Forty eight people completed follow-up questionnaires. Three of these were excluded due to incomplete data, as more than 10% of the questionnaire was not completed. A total of 45 participants were included in the analysis, with 15 in each condition. The majority of the sample were female, with 33 females and 12 males having participated. The only exclusion criteria used was participants must be over the age of eighteen to provide informed consent. Whilst the study concerned mood, exclusion of mood disorders was not used because these interventions have been shown to be equally beneficial for those with depression (Seligman, Steen, Park & Peterson, 2005). Participants were recruited via opportunity sampling with the use of the University's Psychology Research Participation Scheme. This is a website advertising the study to all psychology students where participation points are allocated to those who take part as an incentive to allow them to use this scheme in the future. In addition, friends and family were contacted and the study was advertised on social media accounts and the University's virtual noticeboard.

Materials

Participants needed to have Internet access and a registered email account to complete the study as the questionnaires were only accessible online and instructions were sent via email.

The questionnaires used were: The Gratitude Questionnaire-Six Item Form, The Satisfaction With Life Scale and The Positive and Negative Affect Schedule (McCullough, Emmons & Tsang, 2002; Diener, Emmons, Larsen & Griffin, 1985; Watson, Clark & Tellegen, 1988).

These questionnaires and the ethics documents (participation information sheet, consent form and debrief) were hosted on Qualtrics (an online survey platform).

Instructions for the Three Good Things task came from Seligman (2011) and instructions for the Best Possible Selves task were used from Seear and Vella-Brodrick (2013). These two sets of instructions were slightly adapted because of the differing time frame of the study. The control task of 'Early Memories' originated from Seligman, Steen, Park and Peterson's (2005) paper which did not include accessible instructions so these were created based on the details discussed in the article.

It was suggested to the participants that they should write down their answers from the reflective task. This would require the participant to have pen and paper or use of the appropriate computer software such as Microsoft Word.

Microsoft Excel was used to store the data and for the random allocation procedures, with different documents for the email addresses, raw data and email addresses for the prize draw.

The Gratitude Questionnaire-Six Item Form (GQ-6; McCullough, Emmons & Tsang, 2002)

The GQ-6 is used to measure the trait of dispositional gratefulness. It consists of six items which respondents rate using an eight-point Likert scale. An example of a statement included is "I have so much in life to be thankful for." The overall score is between 6-42, with lower scores suggesting an individual is dispositionally less grateful. In the present study participants had to select a number from a drop-down menu indicating how each statement reflected them. McCullough, Emmons, and Tsang (2002) found that this questionnaire had good internal consistency with an alpha score of .82.

The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985)

This questionnaire was used to assess the degree of satisfaction an individual has with their life. There are five items with statements such as "In most ways my life is close to my ideal." This scale uses an eight-point Likert scale to rate their agreement with the statement. Scores can range from 5-35, with lower scores indicating lesser life satisfaction. A drop-down menu was also used for this questionnaire. Pavot, Diener, Colvin and Sandvik (1991) demonstrated that the SWLS has good convergent validity and predictive validity with alpha levels ranging from .51- .81 when comparing to various similar measures.

The Positive and Negative Affect Schedule (PANAS; Watson, Clark & Tellegen, 1988)

This was designed to measure the degree of positive and negative affect an individual is experiencing. The PANAS is made up of 20 items which are adjectives describing emotions. There are 10 items corresponding to positive affect and 10 for negative affect. Respondents have to rate on a 6 point Likert scale the extent of their agreement in the present moment. Example items include: interested, distressed and excited. Two subscores result from this and scores range from 10-50, with lower scores representing lower frequency of positive or negative affect. This questionnaire was presented as a table with participants needing to select the appropriate tick box which corresponded to their answer. Crawford and Henry (2004) determined that the PANAS is a valid measurement of what it intends to measure and has high reliability. Cronbach's alpha was .89 for the positive affect scale and .85 for the negative affect scale.

Procedure

The study was approved by the University's Psychology research ethics committee to ensure the study adhered to the British Psychological Society's code of conduct (British Psychological Society, 2010).

Participants were recruited through the use of opportunity sampling, either through the Research Participation Scheme or contact from the researcher. Potential participants were directed to a link to Qualtrics, the website hosting the questionnaires. Once they had followed the link, this took them to the participation information sheet which they read before they provided consent to take part in the study. It contained information regarding the nature of the study such as the duration of five days, the time commitment of 10-15 minutes each day, the study week would begin on the following Sunday, and being asked to complete questionnaires at the end of the week. Exact details such as the tasks being PPIs and the happiness focus were withheld because this was considered possibly influential to their responses. The deception was deemed ethical, as participants were told that the study examined how general outlook and daily reflective tasks impact on mood and they were fully informed about their commitment. Participants were informed of their right to withdraw from the study at any time during the study period and up to two weeks after completion, without needing to provide a reason and to no consequence. It was explained that their information would be kept anonymous and confidential and any identifying information such as their email addresses would be kept separately from the questionnaire responses.

Once they had read this, they proceeded to the next page which was the consent form. The design of this was to select check boxes to show agreement with the statements. The statements were: 'I have read and understood the Participation Information Sheet, I understand that my participation in this research is voluntary and that I can withdraw my data at any time during, and up to two weeks after, participating and I consent to participate in this study'. Forced response was issued on these questions so participants could not access the study if they did not consent.

After consenting, participants were asked to generate a unique participation code with the suggested example being the last three letters of their mother's maiden name and last three digits of their telephone number. This code would be used if they wished to withdraw from the study at any point and to keep their data anonymous. Participants were then asked to provide their email address in order to receive the instructions for their daily task. Demographic questions, such as gender, were asked in order to get an overview of participant characteristics.

Participants were then directed to the three questionnaires they were required to fill out which were presented on separate pages. After completing the questionnaires participants were thanked for their time and it was reiterated that they would receive their task instructions via email on the following Sunday.

On each Sunday the researcher collected the email addresses of all the participants who had signed up and completed the questionnaires during the preceding week. Participants were randomly allocated to one of the three tasks. The random allocation procedure was done on Microsoft Excel by creating a list of participant emails and then assigning each a number (1-3) using the 'RANDBETWEEN' function and this corresponded to the selected task. An initial email was then sent out providing instructions on the task which the participants had been allocated to. Care was taken to ensure that the 'BCC' address line was used to ensure identifying information was kept confidential.

Every day in the morning, for the following five days, a daily reminder was sent out to all participants. This was done in a group email using the 'BCC' function. The daily reminder reminded the participant to spend at least 10 minutes on the task that day, provided a brief description of the task, reminded them they could contact the researcher should they have any questions and thanked them for their time.

Participants were reminded at various stages such as the instructions and daily reminder emails and the participant information sheet that they could contact the researcher or their supervisor at any time if they had any questions or concerns.

On Friday, the final day of the study week, participants were then asked to complete the study by following a link to the second survey hosted on Qualtrics was provided in the email. The second survey contained the same questionnaires (GQ-6, SWLS and PANAS) to examine any changes in the variables post-intervention. Participants were thanked for their time and effort in participating in the study.

After completion of the questionnaires, the debrief document was shown on the following page which informed them of the exact nature of the study and provided information on how to seek more information about positive psychology if they were interested. Participants were reminded of their right to withdraw their data and given guidance on where to seek advice if they had any concerns.

To incentivise participants to complete the final part of the study there was an opportunity to enter a prize draw to win a £10 Amazon voucher by providing their email address at the end of the second survey. They were reminded that their email address would be kept confidential, would not be used for any other purposes and would be deleted after the prize draw.

Participants were informed a number of times (participation information sheet, instruction email and debrief) that their information would be kept anonymous and confidential, only the researcher and their supervisor would have access to the raw data and this would be stored on a password protected computer and email addresses would be stored separately to the data so there would not be any personal identifiers alongside the data.

Analytic Strategy

Data were input into SPSS Version 21 for analysis. Due to missing data entries three participants' data were excluded from the analysis. For one missed data entry a substitution was used from the mean score of the other answered questions in that subscale.

A series of 3 x 2 ANOVAs were carried out on each dependent variable: dispositional gratefulness, life satisfaction, positive affect and negative affect to test both hypotheses.

Post-hoc paired samples t-tests were conducted on the life satisfaction variable as the ANOVA showed this to have had significant changes.

A multiple regression analysis was also conducted looking at relationships between the dependent variables. It was examined whether dispositional gratefulness, positive affect and negative affect could predict scores of life satisfaction.

Results

A factorial mixed measures design was used to examine the effect of time and type of intervention on life satisfaction, positive and negative affect and dispositional gratefulness. It was also examined whether there were any interaction effects. The means and standard deviations can be viewed in Tables 1-4 below.

The hypothesis were: there will be a significant difference of Type of Intervention (Three Good Things, Best Possible Selves and Early Memories) on Life Satisfaction, Positive Affect and Negative Affect scores at post-intervention compared to pre-intervention and there will not be a significant difference of Type of Intervention (Three Good Things, Best Possible Selves and Early Memories) on Dispositional Gratefulness at post-intervention compared to pre-intervention.

Table 1

Means and standard deviations of dispositional gratefulness at pre- and post-intervention across the intervention conditions

	Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Three Good Things	34.00	5.13	33.60	6.79
Best Possible Selves	33.60	6.20	32.07	9.06
Early Memories	31.13	4.87	32.33	5.07

Table 2

Means and standard deviations of life satisfaction at pre- and post-intervention across the intervention conditions

	Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Three Good Things	24.93	6.19	24.33	7.42
Best Possible Selves	24.07	7.81	26.40	8.64
Early Memories	19.13	6.65	23.40	6.10

Table 3

Means and standard deviations scores of positive affect at pre- and post-intervention across the intervention conditions

	Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Three Good Things	31.87	8.18	33.00	8.59
Best Possible Selves	26.87	7.53	29.93	8.59
Early Memories	28.07	8.35	30.13	8.19

Table 4

Means and standard deviations scores of negative affect at pre- and post-intervention across the intervention conditions

	Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Three Good Things	15.40	5.40	14.47	6.39
Best Possible Selves	16.13	9.75	16.13	10.61
Early Memories	17.47	7.72	14.67	7.68

Data were screened to check parametric assumptions were met. This included z-scores, skew and kurtosis scores, boxplots, histograms and homogeneity of variance using Levene's test. Parametric assumptions were violated in some instances and this will now be described. For the dispositional gratitude variable there was one outlier from z-scores in the post-intervention condition. There was one outlier according to boxplots in the pre-intervention condition and three in the post-intervention condition. The Three Good Things post-intervention condition was skewed and kurtosed. The Best Possible Selves post-intervention condition was skewed. For the life satisfaction variable there was one outlier in the pre-intervention condition and two outliers in the post-intervention condition as seen in the boxplots. The Best Possible Selves post-intervention condition was skewed and kurtosed. For the positive affect variable there were three outliers in the pre-intervention condition from the boxplots. For the negative affect variable there were two outliers in the pre-intervention condition according to z-scores. There were three outliers in the pre-intervention condition and six outliers in the post-intervention condition according to boxplots. The Three Good Things pre-intervention condition was skewed. The Best Possible Selves pre-intervention condition was skewed and kurtosed. The Early Memories pre-intervention condition was skewed and kurtosed. The Three Good Things post-intervention condition was skewed and kurtosed. The Best Possible Selves post-intervention condition was skewed. The Early Memories post-intervention condition was skewed and kurtosed. As there were outliers transformations of the data were conducted using Field's (2009) recommendations. These did not remove the outliers, the outliers were included in the analysis as they were determined to be legitimate data points and ANOVA is robust

enough to deal with these violations of parametric assumptions. A more stringent alpha level of .01 was therefore used.

Data were analysed using a series of 3 (Type of Intervention) x 2 (Time) ANOVA corresponding to each of the dependent variables.

Dispositional Gratefulness

There was no significant effect of time on dispositional gratefulness, $F(1, 42) = .07$, $p = .80$, $\eta^2 < .01$. There was no significant effect of type of intervention on dispositional gratefulness, $F(2, 42) = .53$, $p = .60$, $\eta^2 = .02$. There was no significant interaction effect between time and type of intervention on dispositional gratefulness, $F(2, 42) = .72$, $p = .49$, $\eta^2 < .01$.

Life Satisfaction

There was a significant effect of time on life satisfaction, $F(1, 42) = 11.93$, $p < .01$, $\eta^2 = .02$, such that life satisfaction scores had increased at post-intervention. There was no significant effect of type of intervention on life satisfaction, $F(2, 42) = 1.43$, $p = .25$, $\eta^2 = .06$. There was a significant interaction effect between time and type of intervention, $F(2, 42) = 5.97$, $p < .01$, $\eta^2 = .019$.

Post-hoc paired samples t-tests showed there was no significant difference in life satisfaction scores at pre- and post-intervention for the Three Good Things intervention, $t(14) = .65$, $p = .26$. There was a significant difference in life satisfaction scores at pre- and post-intervention for the Best Possible Selves intervention, $t(14) = -2.39$, $p = .02$, such that life satisfaction scores post-intervention ($M = 26.40$, $SD = 8.64$) were significantly higher than at pre-intervention ($M = 24.07$, $SD = 7.81$). There was a significant difference in life satisfaction scores at pre- and post-intervention for the Early Memories condition $t(14) = -3.87$, $p < .01$, such that life satisfaction scores post-intervention ($M = 23.40$, $SD = 6.10$) were significantly higher than at pre-intervention ($M = 19.13$, $SD = 6.65$).

Positive Affect

There was no significant effect of time on positive affect, $F(1, 42) = 4.93$, $p = .03$, $\eta^2 = .02$. There was no significant effect of type of intervention on positive affect, $F(2, 42) = 1.20$, $p = .31$, $\eta^2 = .05$. There was no significant interaction effect between time and type of intervention on positive affect, $F(2, 42) = .35$, $p = .71$, $\eta^2 < .01$.

Negative Affect

There was no significant effect of time on negative affect, $F(1, 42) = 2.37$, $p = .13$, $\eta^2 < .01$. There was no significant effect of type of intervention on negative affect, $F(2, 42) = .12$, $p = .89$, $\eta^2 < .01$. There was no significant interaction effect of time and type of intervention on negative affect, $F(2, 42) = 1.04$, $p = .36$, $\eta^2 < .01$.

Correlational Analyses

Correlational analyses were conducted to explore the relationships between the variables. Pre-intervention data was used as most of the variables did not change significantly post-intervention. Figures 1-3 summarise the results.

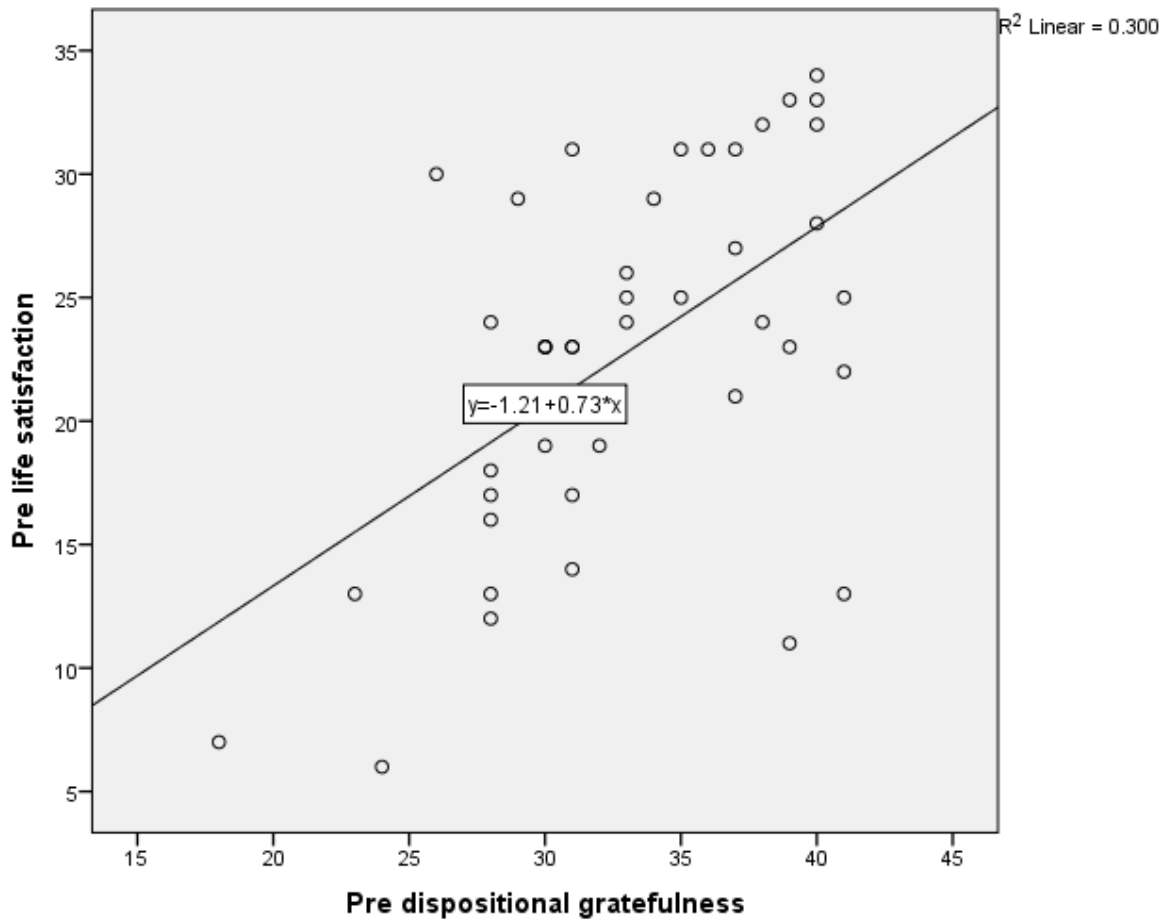


Figure 1: A scatterplot to show the weak positive correlation between dispositional gratefulness and life satisfaction.

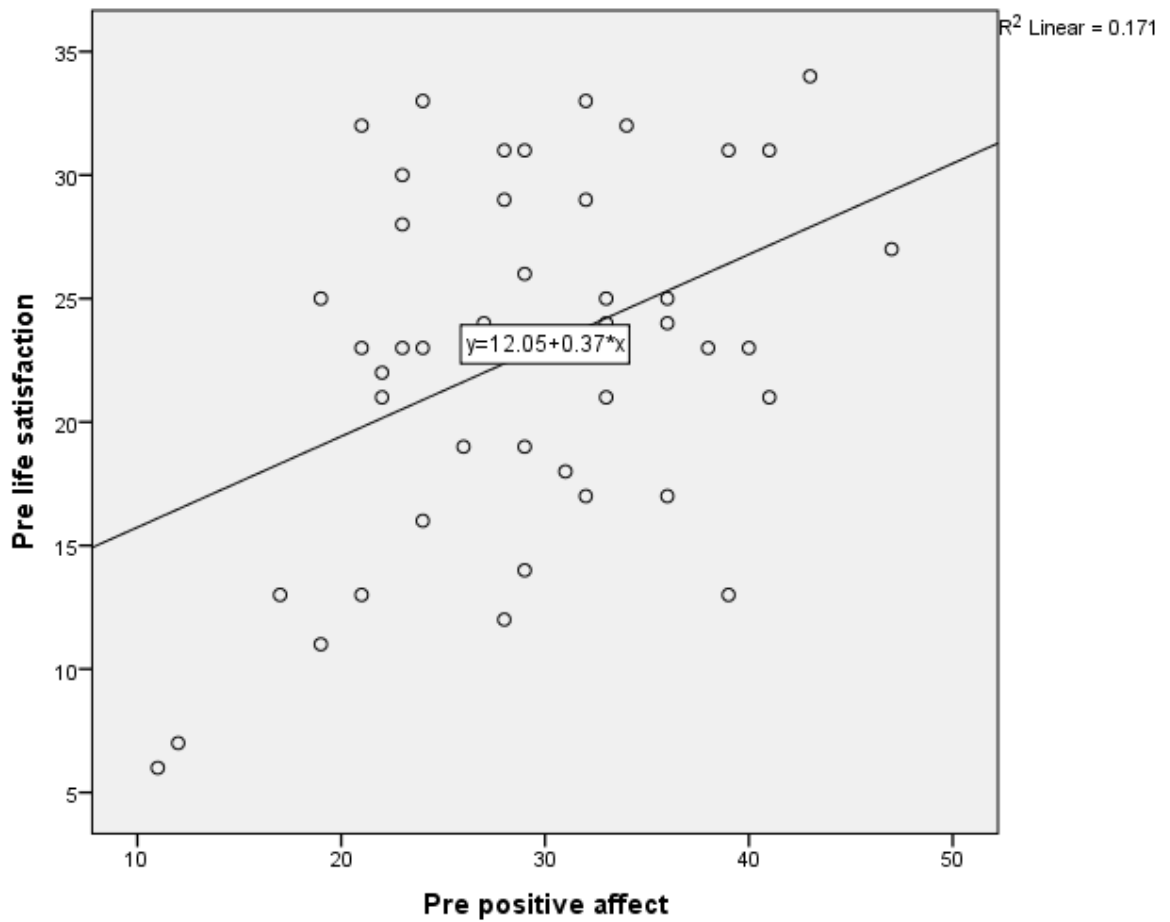


Figure 2: A scatterplot showing the weak positive correlation between positive affect and life satisfaction.

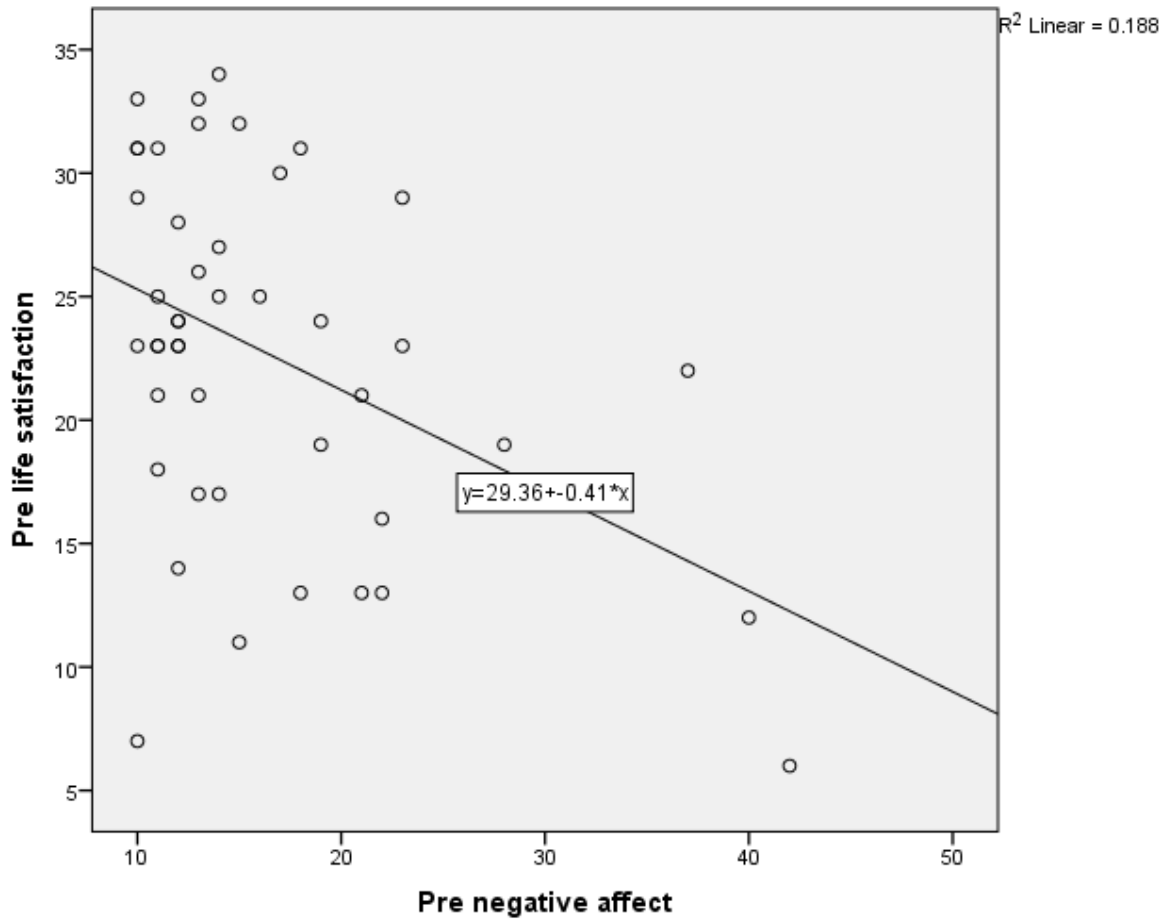


Figure 3: A scatterplot showing the weak negative relationship between negative affect and life satisfaction.

A correlational design was used to examine if Dispositional Gratefulness, Positive Affect and Negative Affect scores can predict Life Satisfaction scores. Correlations between the variables are shown in Table 5.

Table 5

Correlations coefficients (and significance levels) for the predictors (dispositional gratefulness, positive affect and negative affect) and the outcome variable (life satisfaction)

	Dispositional Gratefulness	Positive Affect	Negative Affect
Life Satisfaction	.55 (<.001)	.41 (.002)	-.43 (.001)
Dispositional Gratefulness		.41 (.003)	-.23 (.06)
Positive Affect			-.22 (.075)

There were no problems with multi-collinearity as identified from the Variance Inflation Factor and there were no problems with adjacent residuals being correlated as seen from the Durbin-Watson Test. Data were analysed using a multiple regression using the Enter Method. The regression equation produced a large effect size ($R^2 = .43$, $R^2_{Adj} = .38$), indicating that levels of dispositional gratefulness, positive and negative affect can predict levels of life satisfaction, $F(3, 41) = 10.15$, $p < .001$.

There was a significant positive relationship between dispositional gratefulness and life satisfaction, $t(44) = 3.07$, $p < .01$, with the model predicting that one unit change in dispositional gratefulness would result in an .54 increase in life satisfaction. There was also a significant negative relationship between negative affect and life satisfaction, $t(44) = -2.44$, $p = .02$, with the model predicting that one unit change in negative affect would lead to a .28 decrease in life satisfaction. However, positive affect was not a significant predictor of life satisfaction $t(44) = 1.40$, $p = .17$. The results indicated that higher levels of dispositional gratefulness and lower levels of negative affect the higher the levels of life satisfaction an individual has.

Discussion

A 3 x 2 mixed design was implemented to investigate whether life satisfaction and positive affect would increase and whether negative affect would decrease after participating in a PPI and whether type of intervention, Three Good Things, Best Possible Selves and a control task of Early Memories, would have an impact. The study also investigated whether dispositional gratefulness scores differed after the intervention to support or challenge its status as a trait characteristic. Follow-up correlational analyses were then conducted to explore relationships between the dependent variables and to see if these variables were predictors of life satisfaction.

There was found to be a significant effect of time on life satisfaction, in that life satisfaction scores increased post-intervention which supported the hypothesis. There was also a significant interaction effect between time and type of intervention on life satisfaction such that life satisfaction scores were significantly higher at post-intervention in the Best Possible Selves and Early Memories condition. This supported the hypothesis and suggested an increased beneficial effect for Best Possible Selves compared to the Three Good Things however as the control task also had significant increases this suggests other factors also influenced improvements in life satisfaction. There were no significant effects on dispositional gratefulness, which supported the hypothesis and provided further support for dispositional gratefulness being a stable

characteristic trait. All other ANOVA findings were non-significant and do not support the hypotheses.

There were positive, significant correlations between dispositional gratefulness and positive affect and between dispositional gratefulness and life satisfaction with medium and large effect sizes respectively. This supports the relationship between gratitude and happiness. This also supports findings by Wood, Joseph and Maltby (2009) that life satisfaction is correlated with gratitude and Emmons and McCullough (2003) who found that gratitude and positive emotion are correlated. There was a negative, non-significant correlation between dispositional gratefulness and negative affect which did not support the hypothesis. There was a positive, significant correlation between life satisfaction and positive affect at pre-intervention. There was a negative, significant correlation between life satisfaction and negative affect and there was a negative, non-significant correlation between positive affect and negative affect. Cause and effect cannot be established with correlations so it cannot be determined whether other factors are implicated. However, the significant relationships had at least medium effect sizes with the variables explaining at least 17% of the variance which suggests they do play an important role.

The multiple regression analysis found that levels of dispositional gratefulness, positive and negative affect could predict levels of life satisfaction. Forty two percent of the variance in life satisfaction scores could be explained by dispositional gratefulness, positive affect and negative affect, which is a large effect size. There was a significant positive relationship between dispositional gratefulness and life satisfaction. This furthers Wood, Joseph and Maltby (2009)'s findings by suggesting that gratitude is a predictive variable of life satisfaction and increases support for gratitude PPIs. There was a significant negative relationship between negative affect and life satisfaction. However, positive affect was not a significant predictor.

There was a medium effect size for the type of intervention on life satisfaction result. For type of intervention on positive affect the effect size was approaching medium. The other life satisfaction results, type of intervention on dispositional gratefulness and the effect of time on positive affect results all had small effect sizes. All the other results had very small effect sizes. This suggests that there is no basis for a particular type of intervention over another; individuals should choose whichever they prefer. The effect sizes suggest that PPIs may be most effective at improving life satisfaction compared to other happiness measurements. All effect sizes discussed are according to Cohen's (1988) guidelines. A strength of the present study was the random allocation of participants to each of the intervention conditions. This increases confidence that the findings were not influenced by participant differences opposed to the interventions.

This study unexpectedly did not support past research as there was no significant increase in positive affect or decrease in negative affect following the gratitude intervention which had been found in prior studies including Emmons and McCullough (2003) and Seligman, Steen, Park and Peterson (2005). The limited impact of the PPIs on affectivity could potentially provide support for the set point theory of happiness. However, it would be hasty to disregard the whole PPI literature based on these findings, potential limitations will now be discussed.

The study did not measure adherence to the intervention, therefore these findings could be due to participants not fully completing the intervention task, with no possible

intervention changes to be seen. To account for this, replications could include an additional link on the daily reminders for the participants to send in their completed task, or include questions in the final survey concerning adherence. With this latter idea there is a potential issue with honesty as participants may put forward socially desirable answers which may artificially inflate the adherence rate. Sin and Lyubomirsky (2009) found that self-selecting led to the best outcomes, so the main focus of PPIs should be for those who wish to do these tasks with full knowledge which would presumably be correlated with higher adherence rates.

The prospective power analysis determined that the sample size required for this design was $n=158$. As this study only had 45 participants it did not have sufficient power to detect a significant effect. Lack of participants was due to difficulties with recruitment, and the time commitment may have been a contributing factor for this. There were also issues with participants returning to the follow-up survey. To improve follow-up rates having an increased incentive such as a voucher guaranteed for everybody instead of a prize draw for one may be beneficial though this would require extra funding.

There is a debate in the positive psychology literature about how happiness can be measured. It is difficult to get measurements which capture a wide scope of individual's happiness, this is because when people are asked questions such as 'How satisfied are you with your life?' it is too difficult to think over every aspect of your life and then sum this up as a figure. People use heuristics to answer this quickly (Kahneman, 2011) meaning they use shortcuts and think how does thinking about their life right now make them feel. Changing how a person feels can change how they feel about their life as a whole because if something has made them feel good momentarily then when they think about their life they see it positively. Conversely if something makes them feel negative they evaluate their life negatively. This is seen in a study by Schwarz (1987, as cited in Kahneman, Diener & Schwarz, 1999) who placed a coin on a copy machine for half the participants. These participants rated their happiness and life satisfaction higher than controls who did not find a coin. This can be explained by the focusing illusion (Kahneman, 2011) as things in life seem very important when we give it our attention than when we do not, suggesting that life satisfaction ratings are likely to change depending on what the individual feels is important in their life at that time. Seligman (2011) acknowledges that life satisfaction is more of a measure of cheerful mood as mood influences at least 70% of the life satisfaction individuals report.

Therefore in relation to the present study, instead of capturing a more general evaluation of life happiness and being able to apply this to wellbeing, the measurements are more likely to be capturing a momentary aspect of mood. Including a specific mention of the intervention in the final survey may be necessary for participants to recall any positive experiences from this. Interventions may have a beneficial effect which gets underreported because they are not classed as high-intensity memorable parts of life and are not readily accessed when changes are assessed. To address this, the experience sampling method could be used. This was developed by Larson and Csikszentmihalyi (1983, as cited in Kurtz & Lyubomirsky, 2013) and involves participants using a device which would alert them at various, unexpected time points in the day to answer questions about their mood and what they are currently doing. This may be better at capturing a broader evaluation because it captures information at more time points.

Different studies use a range of definitions for happiness and this is a problem when making comparisons between studies. For example, Sheldon and Lyubomirsky (2006a) use affectivity and life satisfaction as measurements for subjective wellbeing and measure happiness separately. In a later study Sheldon and Lyubomirsky (2012) then use these scales to measure happiness. A consensus should be reached regarding definitions and measurements for happiness and wellbeing in order to increase the validity of research findings in this area and therefore any conclusions made.

Future studies should be adequately powered. PPI researchers need to work towards an agreed understanding regarding how happiness should best be measured and whether questionnaire approaches are appropriate to make any justified conclusions regarding happiness. As it stands, questionnaire methods show positive emotion can be increased for a snapshot of time and this could be implicated by other factors. There should also be agreement on the measures used in order for studies to make draw conclusions adequately, as disagreement decreases the validity of any comparisons as different concepts could be being measured. Measurements of adherence may be useful to include in intervention studies to increase confidence in the findings, but there should be a consideration of the impact of social desirability. This study provides increased support for dispositional gratefulness being a character trait, therefore future studies should explore whether this is a mediating factor of the effectiveness of PPIs.

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