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Boundaries of Fostering Happiness:

Implicit Theories of Happiness Predict Reactions to Positive Psychological Interventions

by

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Master's Thesis

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Abstract

Positive Psychology Interventions (PPIs) are activities designed to facilitate greater psychological well-being through building cognitive and behavioural habits and skills (Seligman, Steen, Park, & Peterson, 2005). However, there may be individual differences that play a role in the effect PPIs have. The present research evaluated how individuals' implicit theories regarding happiness as being controllable or not controllable (Howell, Passmore, & Holder, 2016) may predict their responses to and participation in PPIs, and in turn if those beliefs may be linked to the positive outcomes of the activities. In four online studies, the relationship between implicit theories of happiness and PPIs was explored, first gauging participants' initial thoughts towards PPIs (Study 1; *N* = 164), then evaluating the outcomes of participants completing PPIs (Study 2; *N* = 295), next investigating the potential role of expectancy effects on the positive impact of PPIs (Study 3; *N* = 262), and finally attempting to experimentally manipulate the implicit theories of happiness participants hold to test their causal role on responses to PPIs (Study 4; *N* = 177). Results supported the idea that individual differences in implicit theories of happiness may be an important variable to consider in the way people view and react to PPIs and the benefits they derive from doing PPIs. Experimental studies showed little effect of expectancy and failed to shift people's chronic response style substantially. Results further suggest there may be an indirect relationship between implicit theories, attitudes towards PPIs, and change in affect following PPIs.

Keywords: *implicit theories of emotions, implicit theories of change, positive psychological interventions, happiness, well-being*

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Boundaries of Fostering Happiness: Implicit Theories of Happiness Predict Reactions to Positive Psychological Interventions

Happiness is a vital aspect of well-being, be that psychological, physical, emotional well-being (Ryff, 1989), or personal subjective well-being (Diener, 1984). Despite it being an important part of human life, how to achieve or maintain happiness has been a difficult notion to grapple with for philosophers, psychologists, and individuals for centuries. In a practical sense, the question becomes: how do you take an individual from a state of languishing to a state of flourishing or happiness (Keyes, 2002). While this is an important idea to study, there is also a sometimes forgotten middle step between those two points, where those who are neither languishing nor flourishing exist. It is this population that positive psychologists have aimed to address, attempting to understand why individuals flourish to help those that are in that middle stage to a state of flourishing as well (Keyes & Haidt, 2003). This goal inspired the creation of positive psychological interventions (PPIs): simple activities that could help people harness important aspects of flourishing, to build their own happiness and achieve a state of greater well-being (Lyubomirsky & Layous, 2013; Seligman, Parks, & Steen, 2004).

Many researchers have worked to develop a wide range of these activities, and empirically test them in different circumstances and on different populations (eg., Seligman, Steen, Park, & Peterson, 2005; Lyubomirsky & Layous, 2013). However, despite the growing literature on PPIs themselves, there are very few studies that look at how various individual differences predict the success and efficacy of PPIs. The current research aims to examine the role of one of these individual differences, which has not yet been examined in relation to PPIs:

the implicit theories towards happiness that a person holds, which is the belief one has that happiness is changeable or not. If a person does not believe their happiness can be changed, it is conceivable that they will not be credulous of and respond less favourably to activities that go against their implicit beliefs. This exploratory research aims to evaluate the possible relationship the implicit beliefs of happiness may have with people's responses to PPIs and the role of PPIs in personal mood and happiness.

Positive Psychological Interventions

Positive psychology is a field with a long past, but a short history; it was founded only twenty years ago, but was built on many diverse streams of research and thought throughout the history of psychology, all focused on how to increase human flourishing and happiness, such as the field of Humanistic Psychology (DeCarvelho, 1991), and the work on productivity, positive self-esteem, and optimism, all of which pre-date the advent of the field of Positive Psychology, but provided the foundation for it to grow (Barrett & Ollendick, 2004). Positive Psychology aims to investigate these, and other, disparate strands of research, to encourage their scientific study, and to revitalize lines of research that may have fallen to the wayside of the modern psychological landscape. The field also aims to shift traditional clinical psychology's view on helping humans, which largely tended to concern itself with moving people from a state of languishing to functioning 'normally'. In contrast, the aim of positive psychology was often purported to be a focus on understanding what takes people who are functioning normally to a state where they were truly happy and flourishing in life (Seligman & Pawelski, 2003; Keyes & Haidt, 2003).

One major focus of positive psychology was the practicality of the field. The goal was not only to discover factors that predict human flourishing, but also develop and test strategies and practices that help foster well-being and happiness, by harnessing and applying the factors that enhance flourishing. From this, Positive Psychological Interventions (PPIs) were developed as a way to foster positive character traits through deliberate practice. PPIs are considered a major and important focus of the field, as Seligman, Steen, Park, and Peterson (2005) note that "investigating the efficacy of interventions that increase individual happiness is in many ways, the bottom line of work in positive psychology" (p. 413).

Positive Psychology Interventions (PPIs) are activities designed to facilitate greater psychological well-being by guiding people through positive emotion boosting behaviours (Seligman, *et al.*, 2005). While psychological well-being can be cultivated through brief interventions aimed at developing individual strengths and resources (Sergeant & Mongrain, 2014), programs, interventions, or treatments aimed at fixing, remedying, or healing something that is pathological or deficient, as opposed to building strengths, do not fit the definition of a PPI (Sin & Lyubomirsky, 2009). Sin and Lyubomirsky (2009) surveyed the results of a number of journal articles, concerning 51 different PPIs, all designed to cultivate positive feelings, behaviours, or cognitions. With a mean r effect size of .29 (medium effect size; Cohen, 1988), 96% of the studies reviewed found that PPIs significantly enhanced well-being, and reported improvements in psychological well-being following positive interventions (Sin & Lyubomirsky, 2009).

Although Positive Psychology's main focus emphasizes flourishing rather than fixing what is pathological, researchers nonetheless have also examined the degree to which PPIs may

be beneficial for those with mental illnesses- most commonly, depressive symptoms. Indeed, in their meta-analysis, Sin and Lyubomirsky (2009) also analyzed 25 studies that assessed the effect of PPIs on depressive symptoms and found that 80% of the studies reported a decrease in depressive symptoms after completing PPIs. The mean r effect size for change in depressive symptoms was moderate (r= .31, Cohen, 1988). The authors conclude that PPIs may be effective strategies for clinicians to implement to enhance well-being and quality of life (Sin & Lyubomirsky, 2009), as well as for depressed individuals. Although on the surface, the focus on alleviating depression appears at odds with the field's purported focus on flourishing instead of languishing, researchers have sometimes argued that since existing depression treatments are limited and often focus primarily on alleviating and fixing negatives, there may be value as well in building valuable positive resources for those with depressive symptoms. As a result, positive psychologists have proposed activities such as PPIs, among other positive resource building methods (Sin, Della Porta, & Lyubomirsky, 2011).

It is worth additionally noting that although Sin and Lyubomirsky's (2009) meta-analysis revealed fairly robust effects of these interventions on well-being, they examined mostly the results of published studies which is likely to over-represent the studies revealing positive results, especially as the researchers did not call for unpublished work from the field. Very few studies in the meta-analysis and in the PPI literature report unsuccessful findings; although this may reflect the strength of interventions, it likely is also a product of the publication culture (where positive results are published and null findings often are not). In other words, it is important to keep in mind that claims about the effectiveness of PPIs may be considerably

weighted toward an assessment of published studies that report successful results, and to interpret with caution.

For the scope of the current research, six specific interventions were chosen to be used and evaluated in the current studies, and details of the six interventions are provided in Table 1. Broadly, the six interventions were chosen because a) each focuses on or guides the participant to harness a specific range of concepts found in previous research to be an element of subjective well-being and b) each has been tested in previous research and has demonstrated positive affect or well-being benefits in published research, through the focus on, and building skills in, the parent topic. For example, the Three Good Things PPI is built on the topics previously found to be integral to subjective well-being of gratitude and savouring (Wood, Froh, Geraghty, 2010), and has been tested in previous research and found to significantly increase participants' satisfaction with life and perceived happiness (Seligman, *et al.*, 2005; Carter, *et al.*, 2016). Each PPI follows this pattern, and details of this is provided in Table 1. The full instructions of each of the six interventions is included in Appendix B.

Boundary Conditions and Factors

As noted previously, there is considerable evidence that positive psychology interventions can be effective. However, some researchers have cautioned that published findings to date (especially studies that examine mean differences at the group, or condition, level), may ignore the variability in outcomes that exists within groups in favour of presenting improvement at the aggregate level (Sergeant & Mongrain, 2011). As a result, individuals who are *not* helped by PPIs are often not acknowledged (Lazarus, 2003). This concern is worth considering seriously. Although it is not reasonable that any intervention will affect all

Table 1

Details of the six positive psychological interventions (PPIs) used in the current research

PPI	Studies on PPI*	Topic in Positive Psychology this PPI is based on/harnessing	Parent Topic	Studies on the parent topic*
Best Possible Self	Layous, Nelson, Lyubomirsky, 2013; Peters, Flink, Boersma, & Linton, 2010	Optimism, Positive Affect	Writing about the self as a representation of positive goals	King, 2001; Peters, Flink, Boersma, Linton, 2010
Three Good Things	Seligman, Steen, Park, & Peterson, 2005; Carter *et al*, 2016	Gratitude, savouring	Gratitude, savouring positive events	Wood, Froh, Geraghty, 2010
Finding Silver Linings	Sergeant & Mongrain, 2014	Optimism, Resilience	Writing about the positive aspects of a negative experience	King & Miner, 2000
Noticing Nature	Howell, Dopko, Passmore, & Buro, 2011	Mindfulness	Use nature to prompt mindfulness	Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009
Savouring Walk	Kurtz & Simmons, 2015	Savouring, Mindfulness, Gratitude	Savouring	Bryant, 1989
Random Acts of Kindness	Buchanan & Bardi, 2010	Altruism, Kindness	Altruism, prosocial behaviour	Trivers, 1971; Fehr & Fischnacher, 2003

*The selection of articles is a sampling of relevant literature, not an exhaustive list.

Note: Full instructions for the six PPIs are in Appendix B

participants in precisely the same way, an increased focus on the boundary conditions, or the individual difference factors that may explain, in a systematic way, who benefits and who does not, can be helpful for informing positive psychology theoretically as well as for the development of more effective intervention approaches (Layous, Nelson, & Lyubomirsky, 2013).

In addition to the possibility that, even within apparently successful interventions, some participants who don't benefit go unidentified, there is also a record of mixed success with interventions themselves. Indeed, some researchers have found that some interventions did not fare any better than a positive placebo ('Three good things intervention' & 'Using your signature strengths in a new way intervention'; Mongrain & Anselmo-Matthews, 2012). Others have found some evidence that for individuals higher in anxious concerns regarding possible rejection, completing an online daily gratitude reflection PPI was detrimental for their well-being, and showed decreases in their reported self-esteem (Sergeant & Mongrain, 2011). This suggests that PPIs may not all be unconditionally effective, and are certainly not "one size fits all" – the variability in responding is meaningful and important to understand more fully, especially concerning why different people may be showing mixed success after participating in PPIs.

These inconsistent results indicate there are conditions under which interventions may not be universally effective. Examining why the positive effects found to be a result from PPIs may not be present in all contexts, populations, and situations may be essential in understanding more fully the true value of PPIs, and the limits or caveats to their use and strength. Several factors have been previously considered to predict the effectiveness of PPIs,

generally from two categories, 1) aspects of the PPI itself, such as the duration of the PPI (Lyubomirsky & Layous, 2013), the variety of activities (Lyubomirsky & Layous, 2013; Schueller & Parks, 2012), and if the PPIs were crafted carefully to be generally persuasive (Layous, Nelson, & Lyubomirsky, 2013; Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011); and 2) individual differences, including the enjoyment of the exercise (Schueller & Parks, 2012), how difficult different individuals find them (Sheldon et al., 2010), the sustained effort of the individual (Lyubomirsky *et al.,* 2011), and self-selection of the activity (Lyubomirsky, *et al.*, 2011). In 2014, Sergeant and Mongrain gathered these factors and proposed developing a "second generation" of PPIs by incorporating these optimized design elements for greater effectiveness across several different PPIs, however, there has not been much more movement in this research direction. Additionally, boundary conditions, such as the factors noted previously, have largely only been considered in efforts to maximize PPI engagement (Schueller & Parks, 2012). The nuances of how or why these factors interact with PPIs has not been extensively evaluated, aside from the study from Lyubomirsky and colleagues (2011) that investigated the boundary condition of self-selection. The researchers experimentally replicated a trend they had observed where past research on PPIs where participants self-selected doing a PPI (e.g. Seligman, *et al.,* 2005; Fordyce, 1977) and participated in the activity with the full knowledge of what the PPIs are and the hope that the activities would increase their happiness, lead to stronger and more consistent results than studies where participants are unaware of the true nature of the study (e.g. Lyubomirsky, King, & Diener, 2005; Sheldon & Lyubomirsky, 2006). Lyubomirsky and colleagues (2011) found a significant main effect of self-selection in their research, indicating that those who self-selected participating in a PPI

reported a significantly greater increase in overall well-being after the PPI compared to the non-self-selected participants and compared to the control group who self-selected and completed an inert activity. This finding illuminates the idea that the beliefs and expectations individuals hold going into a PPI may be an important consideration to how they then perceive and interact with the PPI.

In a similar vein, the current research aims to evaluate an individual difference factor, implicit theories of happiness. There may be many more nuanced variables and complex individual differences than what existing research has considered thus far, that may be affecting with the way individuals interact with PPIs. Thoroughly investigating the boundary conditions and limits of PPIs may also be an important facet of knowledge that those who use and recommend PPIs may need to know, and that researchers may need to integrate into their analysis, testing, and development of PPIs to be able to completely capture and understand what PPIs are and what kinds of variables and situations predict their outcomes.

Implicit Theories of Happiness

Lyubomirsky and colleagues' (2011) work illuminated the idea that the beliefs individuals hold could be predicting the way they interact with PPIs, and thus how effective the PPI is for them. The current research aims to investigate this further, delving into the different attitudes and beliefs individuals hold, especially regarding their own emotions, and their views on happiness.

Individuals differ in the level of skill they have with which they can identify their feelings, as well as reflect upon them and manage their own emotions; as a stable individual difference, the theory of emotional regulation postulates that individuals can exert

considerable control over their own emotions, and use a wide variety of strategies to influence how an when they experience emotions (Gross, 1998). This ability to regulate one's mood, at a stable, individual difference level has been investigated by the trait meta-mood literature (Salovey, Stroud, Woolery, & Epel, 2002), however, the scope of the current research will not delve into these aspects from a trait level, but investigate the beliefs and attitudes individuals hold regarding their own emotions.

Dweck's (1996, 1999) work investigated the naturally occurring, internal beliefs people hold regarding human attributes; and as these beliefs are implied rather than explicitly held, they are referred to as implicit theories (Tamir, Srivastava, John, & Gross, 2007). Individuals can hold implicit theories regarding a number of attributes or emotions, such as intelligence or happiness, as being controllable and changing traits, or fixed and not-controllable ones (Dweck, 1999). People who believe these attributes are changeable or dynamic are said to hold an *incremental* mindset towards the attribute, while those who view them as stable or fixed are said to have an *entity* mindset. As PPIs are activities purported to change well-being and happiness, when approaching an intervention, the theories people have regarding the changeability of their own happiness, or happiness as a whole, may be an important factor in the consideration of their effectiveness. Howell, Passmore, and Holder (2016) evaluated the concept of implicit theories of happiness in relation to therapeutic lifestyle changes that increase happiness, such as exercise, a better diet, and a greater exposure to nature, and found that those in an experimentally manipulated incremental condition positively showed more openness and endorsement of the therapeutic lifestyle activities. They view this effect to be especially strong in the activities that required more active and deliberate actions (such as

exercise or involving oneself in nature, as opposed to more passive activities studied, such as engaging in relaxation or maintain relationships), which were noted to be most similar to PPIs. They further speculate that similar to daily activities that increase happiness, an incremental mindset may foster interest and responsiveness to happiness interventions. The current studies build on these findings and speculations.

Beyond the work of Howell et al. (2016), relatively little research has explored the role of implicit theories of happiness, but the few existing findings generally converge on the view that perceived control over emotions or happiness fosters more active coping, and other decisions that might be linked to happiness. A recent paper by Tullett and Plaks (2016) developed the *Lay Theories of Happiness Scale,* and went further into this notion than past research has by assessing three aspects of individuals' a priori theories about happiness, each captured by a subscale of this measure: how controllable, internally driven, and flexible people consider happiness to be. The first is how controllable people believe happiness is, both their own and that of others, and if they view changes in happiness as more due to controllable factors (e.g. lack of effort) or uncontrollable factors (e.g. a sudden illness). The second subscale of the lay theories of happiness scale is the locus of happiness, assessing whether individuals believe happiness comes from within (internal locus of control) or if happiness is attributed to external sources, and the self is not what influences happiness. The third dimension of this scale is flexibility, which reflects whether individuals view happiness as a trait that is stable and underlying, or flexible and dynamic. Tullett and Plaks (2016) found that while these three subscales were conceptually similar, they were not redundant or collapsible, and each had its own amount of predictive power. Although the scale developed by Tullett and Plaks (2016) is

relevant to my research, the research questions investigated in their work focused on empathy and did not address people's reactions to activities that could bolster happiness, this is not pertinent to discuss in detail here. Additionally, the current research will use the scale because in this exploratory work, using a more detailed scale with three different dimensions of focus will allow me to more precisely evaluate different components of implicit theories and capture more nuance about them than I would be able to with a shorter or brief scale, such as the adapted Dweck (1999) scale employed by Howell et al. (2016) in their implicit theories of happiness research. The Lay Theories of Happiness Scale is a more detailed measure, thereby providing a more precise understanding of where effects appear and what drives them.

Overview

The goal of this research is to explore how people approach and comprehend PPIs, and the factors that may be playing a role in those opinions. The following four studies explore the links between positive psychological interventions and implicit theories of happiness. Based on previous literature (Howell, *et al*., 2016), it is hypothesized that the implicit theory regarding happiness a person holds will predict how they perceive and respond to interventions, and those with a 'happiness is changeable' mindset may be more open, more receptive, and more interested in engaging in PPIs designed to bolster positive emotion. They may engage in them more deeply, view them more favourably, and to continue to engage in them again. In turn, because of their positive expectancies, they may also be likely to put more time and effort into these activities when they do try them, and thus potentially leading to greater well-being and happiness. However, those with a 'happiness is stable' mindset may be less open and interested in engaging in PPIs, engage in them less deeply, and because of their lack of confidence in the

efficacy of the PPIs, put less time and effort into the activities when they do try them, thereby potentially yielding less of a positive effect on their well-being or happiness from the activities. While the literature surrounding PPIs makes several distinctions between the interventions and the current studies could look at the specific outcomes of each PPI, this preliminary research will look at them more generally, and has no specific hypotheses on why or how one may perform better or yield greater effects than another.

To evaluate the proposed hypotheses, Study 1 first evaluated whether the implicit theory of happiness an individual holds predicted how they perceived a PPI. Study 2 extended Study 1 by evaluating how individuals approached PPIs, and especially if their implicit theories of happiness predicted their attitudes towards PPIs and their mood after having completed a PPI. Study 3 looked at the expectancy effects that may shape people's opinions towards and affective reactions to the PPIs. Finally, Study 4 attempted to experimentally alter implicit theories to evaluate the causal effect of implicit theories of happiness on attitudes towards PPIs and mood after completing a PPI.

Study 1

Background

The purpose of Study 1 was to examine the links between the naturally occurring lay theories of happiness participants held and the perceptions of positive psychological interventions (PPIs). As this study aimed to gauge initial impressions towards PPIs, participants were asked to read the instructions of six common PPIs and report their impressions of the

activity's appeal, effectiveness, and meaningfulness. Participants in this study were not asked to complete PPIs, only evaluate them.

I predicted that people who believed that they had more personal control over changing their happiness would be more open to PPIs, and might evaluate them as more appealing and effective, as these activities would be congruent with their beliefs regarding happiness (Howell, Passmore, & Holder, 2016). It is also plausible that people who already are higher in perceived happiness would view these positive activities more favourably, and as a result we measured baseline satisfaction with life and examined central analyses including initial life satisfaction as a covariate.

The length of time participants spent reading and considering each set of intervention instructions was also assessed. The longer a participant spent on the instructions of a PPI may conceivably be indicative of their engagement and interest in the intervention. The inclusion of a timer also allowed us to examine the possibility that those who believe they have control over happiness may be more interested in the PPIs. They may spend more time on a page describing an activity that aims to change happiness, taking the time to read the instructions in detail, as opposed to those who do not believe they have control over their happiness, who may take less time on the instructions and view them more dismissively. However, because they are only asked to read instructions and not complete the task, it is impossible to know if more time on a page actually reflects more serious consideration of the PPI – it could be that spending more time reading also gives people more time to find fault with a task. As a result, we examined

time spent on the activity page, but did not specify a clear hypothesis about how we expected it to vary.

Method

Participants

For this study, 164 participants in total were recruited. Participants included 74 university students enrolled in introductory psychology courses, most in their first (32%) or second (35%) year, recruited through Wilfrid Laurier University's Psychology Research Experience Program (PREP) pool, and 90 participants recruited through Amazon's Mechanical Turk (MTurk)[1]. PREP participants were compensated 0.25 credits for their participation; MTurk participants were compensated $1.00 USD for their participation. For the combined sample, 65% of the participants were female, and ages ranged from 18 to 71 (M = 28.6, SD = 11.5). Most participants were Caucasian, Non-Hispanic White, or Euro-American/Canadian (76%).

Procedure

The entire study was completed online using Qualtrics Survey Software via MTurk or PREP. Participants were told they would complete measures of personality and individual differences, to help researchers understand responses to well-known psychological activities. They first completed a consent form, and then measures of demographics to provide information to better understand the sample, including age, gender, and income. All scales and

[1] Preliminary analyses reveal there may be some differences between these samples. Patterns of findings are in the same direction for the PREP sample, but some correlations are not significant, where they are significant for the MTurk sample, indicating slightly stronger results for the MTurk sample. Correlations of main variables for Study 1, with sample included as a control variable, are included in the supplemental analyses section (Appendix A).

materials for Study 1 are included in Appendix B.

Next, participants completed the Satisfaction with Life (SWL) Scale (Diener, Emmons, Larsen, & Griffin, 1985), to provide a baseline assessment of how satisfied participants were with their lives before this study. They then completed the Lay Theories of Happiness Scale (Tullet & Plaks, 2016), as an assessment of the degree to which they believed happiness was controllable, internal, and changeable or uncontrollable, external, and unchanging.

Following these initial surveys, participants received and rated each of the six different positive psychological interventions in a randomized order, randomized by the Qualtrics survey platform (ie. one participant received *best possible selves* first and then answered questions about it, then received *noticing nature*, etc.; whereas another participant would receive *finding silver linings* first, answer questions about it, and then receive *best possible selves*, answer questions about it, and then continued this process for all six interventions). Participants did not complete the actual interventions according to the instructions given; they were simply instructed to read the intervention instructions and imagine themselves doing the interventions. Time spent on each intervention instruction page was recorded.

After participants read the instructions for a PPI, they completed a number of questions that gauged their opinions and attitudes towards the PPI. Participants were also asked to respond to a question concerning if they thought completing the PPI would make them feel better than they do right now. Finally, participants were provided survey questions to ask if they had ever encountered PPIs prior to the study, and then were debriefed and told the true

nature and purpose of the research. Full copies of all of these measures are included in Appendix A.

Materials

Satisfaction with Life. To measure life satisfaction, a component of subjective well-being, participants completed the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), which contains five items (e.g. 'In most ways my life is close to ideal'*)*. This is a well-validated scale with high internal consistency (α = .83; Pavot, Diener, Colvin, & Sandvik, 1991). It is a widely utilized measure (e.g. Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011; Fredrickson, Tugade, Waugh, & Larkin, 2003) that uses a 6-point scale from 1 (*strongly disagree*) to 6 (*strongly agree*) to gauge how subjectively satisfied participants are with their lives as a whole in the current moment (α = .93). Higher scores indicate greater satisfaction with life. For the complete SWL measure, and other measures used in Study 1, see Appendix B.

Implicit Theories of Happiness. To measure the naturally occurring beliefs held regarding the controllability of happiness, participants completed the Lay Theories of Happiness Scale (Tullet & Plaks, 2016). This 33-item scale is comprised of three 11-item subscales, including Controllability, which evaluated how much participants agreed that happiness is a result of controllable factors (α = .91), using 11 items (e.g. 'In all honesty, if someone is unhappy they can usually do something to change that'), including 4 reverse coded items; Internal Locus of Control, which evaluates the extent to which participants believe that happiness comes from within or from an internal source that one is personally responsible for (α = .90), containing 11 items (e.g 'It's a person's perspective, not their situation, which

determines their happiness'), including 4 reverse coded items; and Flexibility, which evaluates how much participants believe that happiness is flexible and ever-changing (α = .89), evaluated with 11 items (e.g. 'Happiness is something that changes a lot over a person's lifetime'), including 5 reverse coded items. Participants responded on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*). Higher scores indicate a greater belief that happiness is controllable, internal, and changeable (i.e. incremental belief).

Attitudes towards Interventions. A self-developed measure gauging attitudes was used to evaluate what participants thought about the interventions they experienced. All items reflected general positive/open or negative/skeptical attitudes towards the PPIs they reviewed. Twelve items were used, and in generating the items three potential subscales were considered, denoting descriptive conceptual differences between items. Items were measured on a 10-point scale from 1 (*strongly disagree*) to 10 (*strongly agree*). The first subscale, interest, gauged how interested participants were in the PPI or in doing the PPI (α = .93) and included 5 items such as "I would be interested in doing this activity regularly" and "This activity was interesting". Two of the five items were reverse coded. The second subscale, perceived meaning, evaluated how profound and meaningful participants thought the PPI was (α = .94) and it included 5 items such as "This activity was meaningful". Three of the five items were reverse coded. The third subscale, effective, evaluated how powerful and impactful this activity would be (α = .90). It included two items such as "I found this activity effective". Although I identified these subscales to be descriptively distinct, a factor analysis (reported in results) indicated that the subscales were not statistically distinct factors, so an overall aggregate of the attitudes questions toward the activity is reported for primary analyses (α = .97). Simply for

descriptive purposes, Study 1 will report the subscales *and* the aggregate of the opinion questions, while Studies 2-4 will only report the results of the aggregate of the opinion questions. For Studies 2-4, individual subscale results will be included in Appendix A.

Feel. To evaluate how participants would perceive they would feel after completing a PPI, compared to before, participants were asked a single self- reported feel item, '*Relative to how you felt before doing this activity, how do you think you would feel after doing this activity?*', evaluated on a 7-point scale, from 1 (worse) to the midpoint of 4 (no different) to 7 (better). This item was included as a further measure of opinions towards PPIs, and it also may capture some perceived changing affect or mood.

Results

Study 1 aimed to evaluate whether the implicit theories of happiness an individual hold predicted how they perceived a PPI. I hypothesized that individuals with a more controllable implicit theory of happiness would view the PPIs more favourably, as the PPIs would be more in line with their beliefs regarding happiness. This hypothesis will be tested by evaluating the correlations between main variables. I will then do subsequent follow up analyses to evaluate the correlations of main variables when the subscales are aggregated by PPI, and when the subscales are divided across PPIs. I will then additionally evaluate measures of engagement with the PPIs.

PPI Attitudes Scale

The self-created PPI attitudes scale was conceived as having three descriptively distinguishable but highly related factors: interest, meaning, and effectiveness. However, factor

analysis (table 2) revealed that the items that compromised these three potential subscales were not statistically distinct factors. Instead, one dominant factor emerged (with an Eigenvalue = 7.91) along with a second weaker factor (Eigenvalue= 1.66). The second factor was comprised entirely of the reverse-coded items, suggesting that this factor emerged due to shared method variance rather than on a conceptual basis. As a result, given that all items were highly intercorrelated and produced a high Cronbach's alpha (α= .97), all items were aggregated to create a general measure of positive attitudes towards PPIs.

Table 2

Factor loadings and communalities based on a principal components analysis with oblimin rotation for 12 items from the self-created PPI Attitudes Scale (N=163)

	Factor 1	Factor 2
1. I would be interested in doing this activity once	**.82**	-.04
2. I would be interested in doing this activity regularly	**.82**	-.08
3. This activity seems effective	**.92**	-.08
4. This activity seems interesting	**.88**	-.11
5. This activity seems powerful	**.92**	-.05
6. This activity seems meaningful	**.83**	-.16
7. *This activity seems shallow	.01	**.85**
8. *This activity seems silly	.04	**.98**
9. This activity seems profound	**.71**	.15
10. *This activity seems boring	-.09	**.83**
11. *This activity seems pointless	-.15	**.85**
12. *This activity seems time-consuming	.02	**.58**
Eigenvalue	7.91	1.66
Percentage of Variance Explained	65.91	13.86

Note: * items are reverse-coded
Note: Factor loadings above .4 are denoted in bold.

Interventions

Participants provided a variety of responses towards six different interventions. Average scores can be found in Table 3. On average, participants gave the Savouring Walk intervention the most favourable rating, and the Best Possible Selves Intervention the lowest ratings. Ratings were on average above the midpoint for positive opinion, as was the participants' assessment of how the intervention would make them feel.

Table 3

Opinion Question Subscale Means by PPI, N=163

	Positive Psychological Interventions, Means (Standard Deviations)					
Opinion Subscales	Savouring Walk	Random Acts of Kindness	Three Good Things	Noticing Nature	Silver Linings	Best Possible Selves
Interest	7.50 (1.92)	6.94 (1.98)	6.24 (2.40)	6.54 (2.27)	5.95 (2.26)	5.65 (2.09)
Meaning	7.90 (1.70)	7.91 (1.91)	7.38 (1.97)	7.12 (2.06)	6.89 (2.00)	6.89 (1.87)
Effective	7.64 (2.34)	7.39 (2.27)	6.65 (2.64)	6.28 (2.67)	6.04 (2.68)	5.98 (2.48)
PPI Attitudes	7.68 (1.87)	7.41 (1.89)	6.76 (2.19)	6.65 (2.17)	6.29 (2.16)	6.18 (1.96)
Feel	5.72 (1.15)	5.58 (1.14)	5.14 (1.16)	5.05 (1.13)	4.64 (1.32)	4.44 (1.38)

Note: *PPI Attitudes* is an aggregate of Interest, Meaning, and Effective subscales
Note: Values indicated are Means (Standard Deviations)
Note: Feel is evaluated on scale from 1-7, while the other scales are on a scale from 1-10

Satisfaction with Life

On average, participants were moderately satisfied with their lives, *M=3.93 (SD=1.28)* on a 6-point scale. Satisfaction with Life (SWL) scale scores significantly predicted interest in PPIs (r (161) =.28, p<.001), belief in meaningfulness of PPIs (r (161)=.30, p<.001), belief in

effectiveness of PPIs (r (161)=.28, p<.001), and if participants thought the PPI would make them feel better (r (161)=.28, p<.001). SWL scores also predicted the implicit theories subscales of controllability (r (161)=.39, p<.001) and internal locus of control (r (161)=.38, p<.001), but not flexibility (r (161)=.01, p=.93). Given that SWL is associated with implicit theories of happiness and may also predict people's responses to PPIs (Howell, Passmore, & Holder, 2016), results will be reported both as zero-order correlations and also as partial correlations covarying SWL. This allows me to evaluate the possibility that the findings are due to the role of SWL as a third variable. This more conservative analysis may illuminate what drives opinions towards PPIs beyond happiness with one's life.

Implicit Theories of Happiness

On average, participants tended to fall slightly above mid-range for emotional controllability, (M=4.39, SD=0.88), on a 6-point scale, indicating a belief in their own ability to control their emotions. Participants, on average, also fell slightly above the midpoint for the measure of internal locus of control (M=3.93, SD=0.88), and flexibility (M=4.67, SD=0.76).

As predicted, participants' level of belief in the controllability of happiness and their perception of happiness being internally controlled predicted a greater positive evaluation of the PPI (aggregate attitudes) as well as each subscale: interest, belief in meaningfulness, and effectiveness of PPIs, as well as the belief that the intervention would make them feel better. The belief in happiness as being generally flexible was not found to predict responses to interventions as strongly, predicting only perceived meaning and feel ratings (Table 4).

Table 4

Correlations of Implicit Theories of Happiness Subscale Items with Opinion Subscales, N=163

	Response to Interventions Subscales				
Variables	Interest	Meaning	Effective	PPI Attitudes	Feel
Controllability	.31***	.41***	.32***	.37**	.37***
Internal Locus	.24**	.30***	.27**	.28***	.27**
Flexibility	.07	.24**	.05	.12	.20*

*p < .05 **p < .01 ***p<.001

Note: *PPI Attitudes* is the aggregate of the three attitudes subscales

Although results demonstrate a clear link between implicit theories of happiness and opinions towards the PPIs, both of these measures were also related to satisfaction with life (SWL). Given that SWL, as a component of subjective well-being (Pavot & Diener, 2008), has also been shown to be related to people's interest in PPIs (Boiler, Haverman, Westerhof, Riper, Smit, & Bohlmeijer, 2013), I also examined partial correlations controlling for SWL. When satisfaction with life was controlled, the hypothesized relation between the controllability and internal locus of control subscales and opinions towards PPIs remained significant for all but one analysis, as internal locus of control no longer predicted interest ratings. Again, the flexibility subscale did not predict the responses to the interventions as strongly as the other lay theories subscales, and it still only predicted perceived meaning and how participants thought they would feel (Table 5).

Table 5

Correlations of Implicit Theories of Happiness Subscales with Opinion Subscales, Controlling for SWL, N=163

	Opinion Subscales				
Variables	Interest	Meaning	Effective	PPI Attitudes	Feel
Controllability	.23**	.34***	.24**	.28***	.29***
Internal Locus	.15	.21**	.18*	.19*	.18*
Flexibility	.07	.26**	.05	.13	.21**

*p < .05 **p < .01 ***p<.001

Note: *PPI Attitudes* is the aggregate of the three attitudes subscales

In the previously reported Table 3 and Table 4, present results aggregated across all six interventions. I also examined (Table 6) each intervention separately (only aggregate attitude is reported rather than all subscales separately). Patterns or correlations were relatively consistent, especially for the controllability subscale: people who believed their happiness was personally controllable responded more favourably to all PPIs except the savouring walk. Internal locus and flexibility showed some inconsistent correlations in the same direction as controllability.

Table 6

Correlations of Implicit Theories of Happiness Subscales with Aggregate Opinion Subscales by PPI, Controlling for SWL, N=163

	Intervention Opinions with Aggregate Attitudes					
Variables	Finding Silver Linings	Best Possible Selves	Random Acts of Kindness	Savouring Walk	Noticing Nature	Three Good Things
Controllability	.29***	.17*	.25**	.13	.16*	.23**
Internal Locus	.23**	.11	.17*	.10	.13	.11
Flexibility	.07	.01	.19*	.10	.17*	.07

*p < .05 **p < .01 ***p<.001

It is also possible to examine each subscale and each intervention separately, while keeping in mind the risk of error and false positives is higher in such a large number of separate correlations. These correlations are reported in Table 7. Again, overall, believing happiness is controllable most consistently predicted more favourable ratings of the PPIs over a variety of subscales, though there was variability throughout depending on the PPI in question, indicating each PPI may not be equally linked to beliefs about the controllability of happiness.

Table 7

Correlations of Implicit Theories of Happiness Subscales with PPI Opinion Subscales for each PPI, Controlling for SWL, N=163

	Positive Psychological Interventions														
	Finding Silver Linings					Best Possible Selves					Random Acts of Kindness				
Variables	Interest	Meaning	Effective	PPI Attitudes	Feel	Interest	Meaning	Effective	PPI Attitudes	Feel	Interest	Meaning	Effective	PPI Attitudes	Feel
Controllability	.28***	.31***	.23**	.30***	.25***	.06	.27***	.14	.17*	.14	.18*	.26***	.25***	.24**	.25**
Internal Locus	.21**	.22**	.20**	.23**	.26***	.03	.15	.12	.11	.04	.14	.18*	.14	.17*	.15
Flexibility	.01	.17*	.03	.08	.07	-.05	.14	-.08	.02	-.01	.11	.28***	.12	.20	.21**

*p < .05 **p < .01 ***p<.001

Note: *PPI Attitudes* is the aggregate of the three attitudes subscales

	Positive Psychological Interventions														
	Savouring Walk					Noticing Nature					Three Good Things				
Variables	Interest	Meaning	Effective	PPI Attitudes	Feel	Interest	Meaning	Effective	PPI Attitudes	Feel	Interest	Meaning	Effective	PPI Attitudes	Feel
Controllability	.16*	.16*	.07	.15	.18*	.13	.25***	.10	.18*	.20**	.19*	.29***	.17*	.24**	.23**
Internal Locus	.09	.11	.07	.10	.18*	.10	.14	.11	.13	.20*	.09	.14	.08	.11	.07
Flexibility	.12	.13	.05	.12	.18*	.13	.26***	.09	.19*	.17*	-.01	.20	.03	.08	.20*

*p < .05 **p < .01 ***p<.001

Note: *PPI Attitudes* is the aggregate of the three attitudes subscales

In this study, I also measured the amount of time each participant spent reading the instructions regarding each intervention, which was captured through the Qualtrics survey platform. Timer results were winzorized to reduce the impact of outliers. Although I speculated that those with beliefs that happiness is more controllable might spend more time reading the instructions, results showed that the timers were not significantly related to any of the variables of interest (Table 8).

Table 8

Correlations of Implicit Theories of Happiness Subscales with PPI Timers, Winsorized, Controlling for SWL, N=160

	Timers for Each Intervention					
Variables	Finding Silver Linings	Best Possible Selves	Random Acts of Kindness	Savouring Walk	Noticing Nature	Three Good Things
Controllability	-.04	.09	.00	-.12	-.12	-.04
Internal Locus	-.14	-.06	.03	-.13	-.13	-.01
Flexibility	-.01	.12	-.05	-.10	-.09	.04

*p < .05 **p < .01 ***p<.001

Finally, participants reported whether they they had experienced any PPIs in the past, and if, so how many (see full measures in Appendix B). While none of the lay theory subscales predicted who had experienced PPIs in the past, all opinion subscales, including the aggregate of the opinion scales and the feel question, predicted previously encountering PPIs (Table 9).

Table 9

Correlations of Implicit Theories of Happiness Subscales and Opinion Subscales with the Past Experiences Question, Controlling for SWL, N=160

Variables	Experience Question
Controllability	-.01
Internal Locus	-.12
Flexibility	.10
Interest	.29***
Meaning	.28***
Effective	.37***
PPI Attitudes	.34***
Feel Question	.26***

*p < .05 **p < .01 ***p<.001

Note: *PPI Attitudes* is the aggregate of the three attitudes subscales

Discussion

In Study 1, implicit theories of happiness were found to predict responses to PPIs. This indicates that people may rely on their lay theories about whether happiness can be intentionally altered to judge the value and effectiveness of interventions meant to boost happiness. The finding is most robust for the controllability subscale: it may be that believing that happiness is controllable is central to people's willingness to take action by engaging in activities designed to enhance happiness. The same effect is found for the belief that happiness comes from within, though slightly less consistently, suggesting these subscales are closely related yet distinct. However, the results of the flexibility subscale were considerably weaker than the other two subscales. Flexibility generally predicted the same patterns with marginal

significance, or did not predict them at all. This may indicate that the flexibility subscale is tapping, at least in part, into a different aspect of the belief that happiness is changeable, perhaps highlighting the more uncontrollable fluctuations and random changes in happiness. This subscale seems lease directly tied to the theoretical questions being investigated in this thesis pertaining to controllability beliefs. Finally, participants responded to a question gauging their familiarity of PPIs. Despite participants with 'happiness is controllable' beliefs responding more favourably to PPIs, it did not predict whether those participants had experienced more PPIs in their lives. Familiarity was predicted by opinion, so if participants had a more favourable opinion they were more likely to also have experienced PPIs more, which may indicate that those who have completed PPIs still view them favourably or they may view PPIS favourably due to their past experiences with them.

This study has several limitations. Firstly, I included six PPIs to increase generalizability and cover a wide range of the positive emotionality that PPIs address. But, reading six PPIs may have become repetitive in this study or caused people to focus more on the comparisons between the PPIs, rather than just on their interest in them. The order the PPIs were presented in was randomized, so it is unlikely this systematically affected any one PPI, but this repetition may have made results weaker as a whole. In spite of this limitation, the strong consistent patterns that emerge suggest a robust effect. Secondly, this study does not get at actual engagement with or consequences of doing the tasks, it only looks at the evaluation and expectancy of the PPIs. Including a timer on the pages with the intervention instructions was an initial attempt to capture some aspect of engagement behaviours, but the timers may not have been a robust way to capture engagement due to the many reasons a participant may have

stayed on a page that were unrelated to the instructions (getting distracted, leaving the study and returning later, reading slowly to critique rather than engage with instructions, etc.). The measure of the time reading the instructions was also likely affected by several factors, as a short time spent reading could indicate disinterested skimming or dislike, or rapid reading driven by interest, familiarity, or ease with the content. Similarly spending longer on the page could speak to not paying attention and getting distracted, or wanting to focus on the text, absorb each word, and critically think about it. A more complex measure of engagement may be needed in future studies to tap into this factor. Finally, the results of this study are correlational. Although they speak strongly to certain relationships between variables being present, cause cannot be inferred from the findings. Experimental research would contribute to understanding the nature of the relationships between variables.

Study 2

Background

In Study 1 participants read only the instructions of six PPIs and reported their impressions. Study 2 aimed to conceptually replicate and extend Study 1, with the major difference that participants were asked to actually complete one of the PPIs, and report their affect before and after the activity. They also reported their opinions of the assigned PPI using the same measure as Study 1. Participants were randomly assigned to complete one of three PPIs (three of the PPIs were chosen from Study 1 on the basis that they were writing-based and could be completed online in a single session). Accordingly, the amount of time spent on the task, and the amount participants wrote can also be examined.

By evaluating people's impressions of a PPI after they have taken part in it, and any changes in mood that arise from participating in activities designed to change happiness, I can test the hypothesis that those who hold a 'happiness is changeable' incremental view will respond more positively to PPIs and engage in them more deeply, resulting in greater positive effects on mood. Similarly, I hypothesized that participants who held a 'happiness is changeable' incremental belief would write more words as this would indicate a greater interest and engagement in interventions. Additionally, participants reported if and how many PPIs they had experienced in the past, I would anticipate those who hold a 'happiness is changeable' belief would view activities designed to change happiness more favourably and thus would have more previous experiences with them.

Method

Participants

For this study, 295 American participants in total were recruited through Amazon's Mechanical Turk. Participants were compensated $1.00 USD for their participation. A total of 52.9% of participants were female, and ages ranged from 19 to 73 (M = 35.3, SD = 10.8). Most participants were Caucasian, Non-Hispanic White, or Euro-American (76.2%), and the average current household income was between $40,000 and $50,000.

Procedure

Participants were told they were completing measures of personality and individual differences, to understand responses to well-known psychological activities. They first completed a consent form, measures of demographics, and then a measure of baseline mood

(Positive Mood α= .87, Negative Mood α= .81). Next, participants completed the Satisfaction with Life Scale (α= .91; Diener, Emmons, Larsen, & Griffin, 1985), and completed the Lay Theories of Happiness Scale (with subscales Controllability α= .89, Internal Locus of Control α= .84, and Flexibility α= .84; Tullet & Plaks, 2016), as was done in Study 1. All materials for Study 2 are included in Appendix C.

Participants then completed one of three written positive psychological interventions, either Finding Silver Linings (Sergeant & Mongrain, 2014), which broadly aims to foster optimism and resilience; Best Possible Self (Layous, Nelson, Lyubomirsky, 2013; Peters, Flink, Boersma, & Linton, 2010), which focusses on positive goals, and optimism; or Three Good Things (Seligman, Steen, Park, & Peterson, 2005; Carter *et al*, 2016), which focusses on gratitude and savouring positive events. These three interventions were selected because they were used in Study 1, and were the 3 activities that could be completed in writing in a single session online. I included three possible PPIs to increase generalizability, and had no specific predictions about expected differences between PPIs.

Participants completed the earlier measure of mood again (Positive Mood α= .89, Negative Mood α= .83), and were then asked to indicate their impressions of the PPI they completed (α=.91) as well as how it made them feel, as was asked in Study 1, with the questions altered in phrasing to reflect that participants had participated in the PPIs in this study (See full instruction in Appendix C). Only the aggregate of the opinion questions will be reported in this study; results of the subscales are included in Appendix A. Finally, participants were asked if they had ever encountered PPIs prior to the study, and then were debriefed and told the true nature and purpose of the research.

Materials

Positive and Negative Mood. To evaluate positive and negative mood both before the participants completed the PPI and after, participants completed a 8-item measure of affect, comprised of two 4-item subscales of Positive Mood (PM) and Negative Mood (NM). The PM subscale consisted of 4 items such as 'Happy' and 'Enthusiastic' (Pre-PPI α= .87, post-PPI α= .89), and the NM subscale consisted of 4 items such as 'Sad' and 'Impatient' (Pre-PPI α= .81, post-PPI α= .83). Several items were adapted from the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). However, this study was interested in only the activation and change of relevant emotional items that evaluated mood on the basis of pleasant affect and unpleasant affect. Past research has argued that affectively valanced items (such as items that represent pleasant (eg. Happy) or unpleasant (eg. Sad) mood) better represents the kind of mood the current research was focussing on improving (Lyubomirsky, *et al*., 2011), as opposed to some of the adjectives reflecting activation from the PANAS scale (ie. jittery). Thus these activation items from the PANAS scale were not included. For the complete mood measure, and the other measures used in Study 2, see Appendix C.

Results

Study 2 aimed to how individuals approached PPIs, especially if their implicit theories of happiness predicted their attitudes towards PPIs and their mood after having completed a PPI. I hypothesized that individuals with a more controllable implicit theory of happiness would respond more favourably to PPIs, and engage in them more deeply, resulting in greater positive effects on mood, and also they would show greater interest and engagement with the PPIs than those who do not believe happiness sis controllable. This hypothesis will be tested by

evaluating the correlations between main variables, as well as evaluating correlations of main variables with measures of engagement. I will then do subsequent follow up analyses to evaluate the correlations of main variables for each of the PPIs.

Interventions

Participants rated their opinions of the interventions and how they thought it made them feel. Average scores can be found in Table 10. Descriptively, participants gave the Three Good Things intervention the most favourable ratings, and the Best Possible Selves Intervention the lowest ratings. A one-way repeated measures ANOVA revealed that there was a significant main effect of time on positive mood before and after participating in the PPIs, $F(1, 292)= 5.25$, $p<.05$, $\eta^2= .02$, indicating that positive mood was significantly higher after than before (pre-PPI mood M=3.02, SD=.98, post-PPI mood M=3.09, SD=1.05). Of course, because this study did not include a control group, claims cannot be made about the PPIs affecting mood. Results indicate only that individuals reported a slight increase in mood from baseline to the post-PPI.

Table 10

Means of Opinion Scales by PPIs, N=293

	Interventions, Means (Standard Deviations)			
Response Subscales	Three Good Things	Silver Linings	Best Possible Selves	PPIs Combined
PPI Attitudes	6.68 (2.05)	6.60 (2.02)	6.60 (2.12)	6.63 (2.06)
Feel	4.96 (1.11)	4.75 (1.18)	4.8 (1.48)	4.84 (1.25)

Note: Values indicated are Means (Standard Deviations)

Satisfaction with Life Scale

On average, participants were moderately satisfied with their lives, *M=4.15 (SD=1.18)*. Satisfaction with Life scale scores (Table 11) significantly predicted positive attitudes towards PPIs, and if participants thought the PPI would make them feel better. SWL scores also predicted participants' controllability and internal locus lay theory scores. Because of strong associations with SWL, analyses will again be conducted both with SWL as a covariate and without it. The more conservative results, those that control for SWL will be discussed in this section; the results not controlling for SWL are included in Appendix A.

Table 11

Correlations between Satisfaction with Life Scores, PPI Opinion and Implicit Theories of Happiness subscale items, N=293

	Opinion and Implicit Theory Subscales				
Variable	PPI Attitude	Feel	Controllability	Internal Locus	Flexibility
SWL	.35***	.19***	.37***	.37***	.04

*p < .05 **p < .01 ***p<.001

Implicit Theories of Happiness

Study 2 expanded the previous study by examining implicit theories of happiness as a predictor of PPIs attitudes (post-completion), mood change (from pre-PPI to post-PPI), and word count (Table 12). Results for the three PPIs are presented together, and all results are controlling for satisfaction with life (for results not controlling for SWL, see Appendix A). Contrary to my speculation that incremental theorists may experience a larger increase in

Table 12

Correlations of all variables, with combined intervention responses, controlling for SWL, N=288

	Combined Intervention Responses				
Subscales	PPI Attitudes	Feel	Difference Positive Mood	Difference Negative Mood	Word Count Total
Controllability	.16**	.06	.06	-.003	.21***
Internal Locus	.13*	.04	.11	-.02	.19***
Flexibility	.10	-.02	.04	-.10	.21***
PPI Attitudes		.42***	.34***	-.22***	.11
Feel			.51***	-.31***	.01

*p < .05 **p < .01 ***p<.001

Note: *Difference Positive Mood* and *Difference Negative Mood* are difference scores, generated by subtracting post-PPI mood scores from the baseline mood scores

positive mood, implicit theories did not predict any change in mood scores. However, the implicit theory subscales, most strongly the controllability subscale, predicted more positive attitudes towards PPIs; a more positive attitude towards the PPIs as well as perceiving the PPI to have made them feel better predicted a greater increase in positive mood and a greater decrease in negative mood.

Additionally, in line with the prediction that those who believe happiness is more controllable would engage more deeply

with activities, the lay theory subscales predicted more words written for the interventions overall. However, word count did not directly predict mood change, suggesting that engagement alone (captured by a rough measure of writing length) may not be enough to foster increased mood.

PROCESS was used to test whether attitudes towards PPIs mediated the relationship between implicit theories of happiness (using the controllability subscale) and positive mood. SWL was included as a covariate. Results (figure 1) suggested that implicit theories of happiness predicted opinions regarding PPIs, b = .35, t = 2.51, p = .01, 95% CI [.076, .631], and accounted for 14% of thevariance. Implicit theories of happiness was not a significant predictor of positive mood[2], b = .005, t = .13, p=.897, 95% CI [-.067, .077]. When opinions regarding PPIs was entered into the model, implicit theories of happiness was not significant predictor b = .005, t = .13, p=.897, 95% CI [-.067, .077], and opinions regarding PPIs was significant, b =.10, t = 6.56, p < .001, 95% CI [.069, .128]. This model accounted for 14% of the variance in positive mood. Results suggested that the indirect effect of implicit theories of happiness on positive mood through opinions regarding PPIs (.03) was significant, BootCI [.005, .070]. The opinions regarding PPIs mediated the relationship between implicit theories of happiness and positive mood. Having a belief that happiness is not controllable may reduce individuals' opinions regarding PPIs which in turn is related to a lesser increase in positive mood.

[2] Traditionally, a significant relationship between the two main variables (without the mediator) was seen as a requirement for mediation, but more recent approaches (eg. Hayes, 2013, 2018) suggest that there can be a significant indirect effect, even in the absence of a significant total effect.

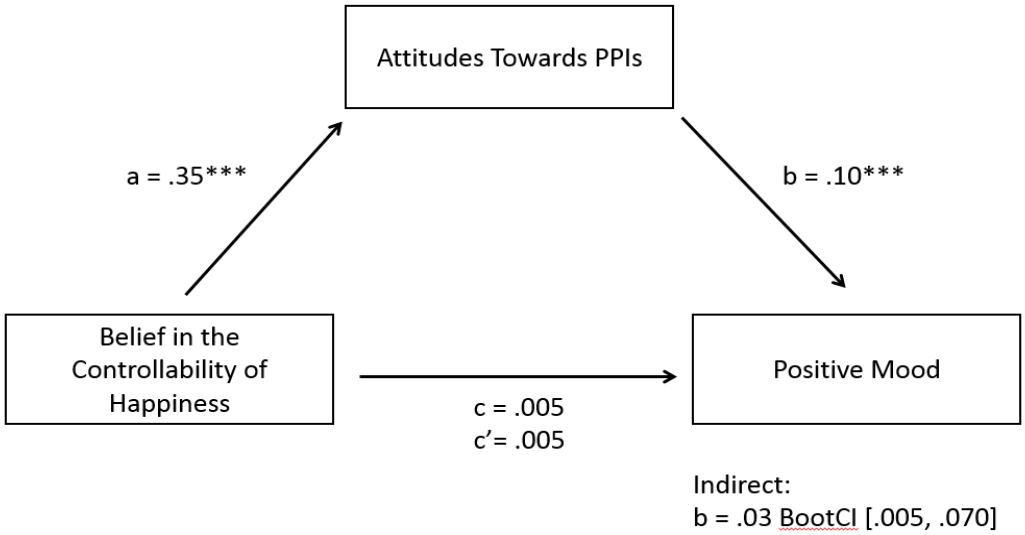

Figure 1. Indirect Relationship between Controllability of Happiness, Attitudes towards PPIs, and Positive Mood

Finding Silver Linings Intervention

It is worth noting that several findings varied across the three interventions participants completed (individuals only completed one of three PPIs, so analyses conducted on separate PPIs have a third of the total sample size). Considering the finding silver linings PPI (Table 13), the implicit theory held did not predict attitudes towards PPIs or changes in mood, aside from the flexibility subscale of the implicit theories scale predicting a significant decrease in negative affect. However, a more positive attitude towards the PPI did predict significant increases in positive mood, as well as self-perceptions that the PPI increased their mood. Word count was not significantly predicted by the measure of implicit theory, nor by opinions of the PPI for this PPI.

Table 13

Finding Silver Linings PPI condition, correlations with all variables, controlling for SWL Scale, N=109

	Finding Silver Linings PPI Responses					
Subscales	PPI Attitudes	WC All	WC Answers	Feel	Difference Positive Mood	Difference Negative Mood
Controllability	.17	.08	.18	.07	.01	-.15
Internal Locus	.14	.04	.12	-.01	.09	-.06
Flexibility	.14	.11	.18	-.01	.03	-.21*
PPI Attitudes		.14	.15	.28**	.28**	-.08

*p < .05 **p < .01 ***p<.001

note: WC All is the word count for all the answers of the PPI, and WC Answers is the word count excluding question 1 of the PPI which asks the participant to describe a small negative event from their day. Items 2, 3, and 4 are the positive items that contain the positive aspect of the PPI.

Best Possible Selves Intervention

Regarding the best possible selves PPI (Table 14), implicit theories of happiness did not predict attitudes towards PPIs; nor did the implicit theory predict changes in mood. However, a more positive attitude of the PPI did predict an increase in positive mood and self-perceptions that the PPI increased their mood, as well as a decrease in negative mood. Additionally, a higher word count for the PPI was predicted by the implicit theories subscales.

Table 14

Best Possible Self PPI condition, correlations with all variables, controlling for SWL Scale, N=79

Subscales	Best Possible Self PPI Responses				
	PPI Attitudes	Word Count	Feel	Difference Positive Mood	Difference Negative Mood
Controllability	.004	.34**	-.05	.08	.14
Internal Locus	.002	.26*	-.12	.05	.04
Flexibility	.06	.41***	-.03	.09	-.03
PPI Attitudes		.13	.44***	.47***	-.31**

*p < .05 **p < .01 ***p<.001

Three Good Things Intervention

For the Three Good Things PPI (Table 15), implicit theories of happiness subscales controllability and internal locus of control predicted attitudes towards the PPI. The implicit theory held did not predict changes in mood, however, a more positive attitude towards the PPI did predict significant an increase in positive mood and self-perceptions that the PPI increased their mood, as well as a decrease in negative mood. A higher word count for this PPI was predicted by the controllability and internal locus of control subscales of implicit theories.

Table 15

Three Good Things PPI condition, correlations with all variables, controlling for SWL Scale, N=97

	Three Good Things PPI Responses				
	PPI Attitudes	Word Count	Feel	Difference Positive Mood	Difference Negative Mood
Controllability	.30**	.25*	.16	.11	.01
Internal Locus	.23*	.25*	.22*	.17	-.02
Flexibility	.08	.18	.02	.07	-.08
PPI Attitudes		.18	.55***	.32***	-.29**

**p < .05 **p < .01 ***p<.001*

Past Experiences of PPIs

Participants responded to a question measuring if and how many PPIs they had encountered in the past, either the same as the PPIs included in the study or similar ones. Contrary to what I anticipated, responses (Table 16) indicated that a greater belief that happiness is not controllable predicted more experiences in the past with PPIs.

Table 16

Correlations of Lay Theories of Happiness Subscales and Opinion subscales with the past experiences question, Controlling for SWL, N=288

Variables	Experience Question
Controllability	-.23***
Internal Locus	-.16**
Flexibility	-.27***
PPI Attitudes	-.06
Feel	.03

*p < .05 **p < .01 ***p<.001

Discussion

Study 2 examined the role of implicit theories not only in predicting impressions and consequences of PPIs on the basis of reading instructions, but after participants had actually completed one PPI. When examining the combined results of the three interventions, I found that people who believe that happiness is controllable, comes from within, and is flexible were more likely to report greater positive attitudes towards PPIs. They also engaged more with the PPIs, as measured by a higher word count. Similar to Study 1, the controllability subscale appears to most consistently predict hypothesized links, likely because it is the most direct assessment of whether people feel they can alter their happiness with PPIs. Internal locus of control and flexibility follow the same pattern with slightly less consistent effects. Like Study 1, the flexibility subscale revealed the least consistent patterns of results, especially in the case of the three good things intervention, further speaking to the notion that it may be tapping into a different aspect of implicit theories (likely the notion that happiness can fluctuate, perhaps beyond personal control).

Although I predicted that lay theories of happiness might predict increases in positive mood after completion of PPIs, the direct link between implicit theories and mood was not detected for any of the PPIs of this study. Instead, results may suggest a more indirect relationship between lay theories and mood, such that lay theories predict people's attitudes towards PPIs, and those opinions in turn predict mood. Because this study is correlational, this reasoning about an indirect path is speculative but may plausibly explain the links between lay theories, PPI attitudes, and mood.

I selected three PPIs (each participant completing one of the three) to increase generalizability. Although no specific differences between PPIs were hypothesized, each of the three PPIs yielded slightly different patterns of results. Broadly results showed a similar pattern across many of the measures, but significance levels tended to vary from PPI to PPI. I examined each PPI condition separately, keeping in mind the lower number of participants per PPI. The three good things PPI had the most consistent pattern of results, while the finding silver linings PPI and the best possible self PPI differed more notably from the central predictions, with very little relation between lay theories and opinions of the PPIs. Although I made no specific predictions about how the PPIs may differ, given the inconsistency between PPIs, it may be that examining the aggregate data across PPIs is ill-advised. Further, it is worth noting that although there was some evidence of an increase in positive mood from before to after the PPI, the evidence for a boost in happiness was rather minimal. One reason for this may be that some of the PPIs were the lowest-rated in Study 1. While they each have been the focus of research documenting their positive effects, it is important to consider that several of the researchers note that PPIs are most effective when practiced several times or regularly (Seligman, *et al*, 2005). This may reflect on the potential ease or skill required to attain the maximum benefit from a PPI.

Additionally, those with 'happiness is not controllable' beliefs reported having previously experienced PPIs significantly more than those who believe happiness is controllable. This was unexpected as it would be congruent that those who believe that happiness can be changed would participate in happiness changing activities like PPIs more, as they are congruent with their beliefs. However, this study found the opposite, which suggests

that those who believe happiness is not changeable have completed more activities that are inconsistent with their beliefs. It is possible that entity theorists (who are less satisfied with life) had more motivation to seek out happiness-enhancing activities than more satisfied incremental theorists. This may also be a result of these people trying PPIs in the past and not feeling or experiencing the change or impact of effects that were advertised by the PPI, for any number of reasons. Perhaps they were not properly instructed, did not fully engage with the activity, or they did not experience any immediate or lasting effects from the PPI. Additionally, the context in which they experienced PPIs may have affected their lasting impression on PPIs or the controllability of happiness as a whole, for example, having experienced PPIs in therapy or in the workplace. This inconsistent finding is worth future investigation concerning how experience with PPIs may interact with or form certain beliefs towards happiness as a whole.

With potential indirect relationships between variables and varying results for each PPI, Study 2 findings paint a slightly more complex picture than Study 1. The difference in results highlight that *completing* a PPI may involve a range of additional responses not captured simply by *reading* about the PPI. People may rely significantly on their lay theories to respond to a question about what they think of an intervention's effectiveness or how they "would" feel if they completed it; in contrast, actually completing an intervention takes thought, decision making, effort to recall and communicate specific events, and may be more influenced by mood, personal opinions, recent experiences, and other personality factors. It is not clear why implicit theories did not predict mood directly, but only indirectly through PPI opinions. It is possible that the direct link between implicit theories and mood change is supressed in some way- for example, if incremental theorists start off happier, they may have less room for

positive change (a ceiling effect), or may not be motivated to put much effort into a task if they are already happy. However, possible explanations are purely speculative since the indirect (but not direct) effect was unexpected.

While this study begins to explore several interesting relationships between phenomena, it also has several limitations. The first is that there may be expectancy or placebo effects at work in the results of the PPIs, especially as the most favourably rated PPI (the one rated as most interesting, meaningful, etc.) showed the strongest link to mood and the least favourably rated PPI showed the least effect. It could be that the PPI that makes a good first impression is expected to be effective, which could result in more serious engagement with the task and a subsequently more favourable mood. Secondly, the word count measure, although it represents a rough measure of engagement, may not really be a robust way to capture PPI engagement. Engagement may be reflected in thoughtful personal answers, not only number of words. Future research should examine nuanced differences in the content of PPI responses and how this relates to implicit theories and mood. Further, the online survey completed for compensation may have incentivised participants to write less or to not consider the PPIs as deeply as they might have in person or if they completed the PPI in a distraction-free, supervised environment. Word count findings may also be limited by the differences in the PPIs themselves, as predicted word count increases were present in best possible selves and three good things PPIs, but not the finding silver linings PPI. This may be due to the more straightforward and less open –ended nature of the finding silver linings PPI, which asks participants to report events that happened in their day, and not extended personal thoughts or stories.

Finally, because opinion of the PPIs predicted changes in mood (possibly mediating the link between implicit theories and mood change), future research could consider manipulating this possible mediator by altering the opinions individuals hold towards PPIs. Getting people to believe a task will be effective may be one way to increase the impact of PPIs on mood and happiness. In Study 3 I make an initial attempt at experimentally altering people's expectations about the effectiveness of the PPI activity.

Study 3

Background

Building on the findings of Studies 1 and 2, Study 3 aims to evaluate the expectancy effects that shape people's opinions towards and affective reactions to the PPIs (Mongrain & Anselmo-Matthews, 2012). There is an interesting parallel between implicit theories of happiness (believing one can control one's own happiness), and expectancy effects that may produce both self-fulfilling prophecy effects as well as account for placebo effects. It is possible that incremental theorists (those with 'happiness is controllable' beliefs) expect PPIs to be effective, then accordingly take them seriously and devote effort to them, and as a result experience more mood boost. If so, it is possible that the same effects could be achieved by experimentally altering the expectations people have about the task's effectiveness. I sought to test the role of PPI expectation (separate from those that might be fostered by implicit theories) by describing the PPI activities as either proven to improve happiness, have been shown to <u>not</u> improve happiness, or neutrally with no specific expectancy mentioned (see Appendix D for full materials for this study). This manipulation is designed to evaluate the effect

of persuasive instruction that may sway participants to expect positive changes in their happiness, independent of any effect of the PPI activity itself. This study will speak, at least indirectly, to the results of Studies 1 and 2: if positive expectancy alters the degree to which PPIs are effective, then it is possible that incremental implicit theorists (those will a 'happiness is controllable' belief) expect PPIs to be more effective, and this expectation results in more positive outcomes.

To examine the possible role of expectancy effects, Study 2's central method was replicated, but with the instructions varied across the three different expectancy effect conditions. Instructions indicated that the activity has been shown to effectively enhance happiness (positive), that it is purported to have benefits but in fact has been shown to have no effect (negative), or participants will be introduced to the activity with no information about known consequences (control). These instructions were paired with a PPI task that has actually been found effective in past research (Three Good Things; Seligman, Steen, Park, & Peterson, 2005; Carter *et al*, 2016).

I hypothesize that expectancy may have some effect independent of the PPI itself (with people who are told to expect benefits possibly showing more positive effects). I do not have a strong prediction regarding the strength of the expectancy effect; the study is designed to test it but is agnostic about the possible level of impact. Further, implicit theories of happiness will be measured and tested as a predictor as in prior studies; opinions towards the PPI and mood will also be measured. I expect that incremental theorists will still have more positive opinions

expectations of PPIs and may experience more positive mood change (either directly or indirectly through PPI attitudes as in Study 2).

Methods

Participants

For this study, 300 American participants in total were recruited through Amazon's Mechanical Turk. Participants were compensated $1.00 USD for their participation. 38 participants were excluded for failing attention checks, resulting in a total of 262 participants. 51.9% of participants were male, and ages ranged from 19 to 72 (M = 35.5, SD = 11.4). Most participants were Caucasian, Non-Hispanic White, or Euro-American (69.8%), and the average current household income was between $40,000 and $50,000.

Procedure

Initially, participants were told they were completing measures of personality and individual differences, to understand responses to well-known psychological activities. Similar to Study 2, they first completed a consent form, measures of demographics, and then a measure of baseline mood (Positive Mood α= .90, Negative Mood α= .88), a scale of baseline Satisfaction with Life (α= .94; SWL scale; Diener, Emmons, Larsen, & Griffin, 1985), and the Lay Theories of Happiness Scale (with subscales Controllability α= .89, Internal Locus of Control α= .86, and Flexibility α= .86; Tullet & Plaks, 2016). In this study, participants completed an additional measure of Lay Theories of Happiness (α= .89), adapted from Dweck's scale (1999; Adapted by Howell, Passmore, & Holder, 2016); which maps more closely to the most commonly used measures of implicit theories of malleable or stable attributes (typically

adapted from Dweck, 1999), allowing me to compare the effects of this brief scale to the three dimensions of the Tullet and Plaks (2016) Lay Theories of Happiness Scale. All materials for Study 3 are included in Appendix D.

Participants were randomly assigned one of three instructions regarding an activity they would complete. These instructions were either positive instructions that support the activity and describe it as an effective way to improve happiness, neutral instructions which do not describe the activity as having to do with happiness at all, or negative instructions, which present the activity skeptically and as an activity that has not been found to have a positive impact on happiness. The full phrasing of the instruction is in Appendix D. Accompanying the instructions was the positive psychological intervention Three Good Things (Seligman, Steen, Park, & Peterson, 2005; Carter *et al*, 2016), which focusses on gratitude and savouring positive events. Three good things was chosen as the only PPI to be completed for this study as it is a well-supported and tested PPI, and it produced consistent results and was favourably viewed by participants in Studies 1 and 2.

Participants then completed the earlier measure of mood (Positive Mood α= .89, Negative Mood α= 86) and satisfaction with life again (α= .95; SWL scale; Diener, *et al*., 1985), and then were asked to indicate their opinions and attitudes towards the PPI they completed (α= .93), as well as how it made them feel, in the same way as Study 2. Finally participants were asked if they had ever encountered PPIs prior to the study, and then were debriefed and told the true nature and purpose of the research.

Materials

Lay Theories of Happiness. As an additional measure of the implicit theories towards the controllability of happiness participants may hold, they completed a measure of Lay Theories of Happiness, adapted from Dweck's implicit theories scale (1999; Adapted by Howell, Passmore, & Holder, 2016). This 8-item measure (eg. 'I can always substantially change how happy I am') contained 4 reverse coded items and was evaluated on a 6-point scale from 1 (*Strongly disagree*) to 6 (*Strongly agree).* Items evaluated how much participants believed happiness could be changed, with higher scores indicating a belief that happiness is changeable (α= .89).

Results

Study 3 aimed to experimentally manipulate the expectancy effects that may shape people's opinions towards PPIs as well as affective reactions to the PPIs. I hypothesized that expectancy may have some effect independent of the PPI itself, with those in the condition instructed to expect benefits possibly showing more positive effects, however I do not have a strong prediction regarding the strength of the expectancy effect. Additionally, I hypothesize that individuals who believe happiness is controllable will still have more positive expectations of PPIs and my experience more positive mood change. This hypothesis will be tested through ANOVA analyses on each of the main variables. I will then do subsequent follow up analyses to evaluate the correlations of main variables, as well as correlations of main variables in each condition.

Experimental Expectancy Effects

First, I evaluated the manipulation of participants' expectations. Between-subjects ANOVAs examined the effect of condition (positive, neutral, and negative instructions) on PPI attitudes and on how people reported feeling after completing the PPI compared to before. The effect of condition on PPI attitudes was not significant, $F(1, 260)=1.07$, $p=.345$, $\eta^2=.008$; and the effect of condition on perceived change in one's feelings was also not significant, $F(1, 260)=.519$, $p=.596$, $\eta^2=.004$ (see table 17 for means). These results suggest that the expectancy condition did not appear to affect people's opinions of the PPI. Since this scale was fairly closely tied to the instructions about PPI effectiveness, the lack of effect may suggest that the manipulation was generally ineffective at altering expectancy, rather than concluding that expectancy (if effectively altered) has no effect.

To examine change in affect from baseline to post-PPI, I conducted a series of Condition (Positive, Neutral, Negative Instructions) x Time (pre, post) mixed ANOVAs. Time was the within-subjects factor and condition was between-subjects. The first mixed ANOVA on the SWL dependent variable examined changes in satisfaction with life over time, and whether they varied by condition. A main effect of time, $F(1, 259)=3.95$, $p=.048$, $\eta^2= .015$, indicated that SWL was higher after the completion of the PPI than before (see table 17 for all means). Further, a marginally significant interaction between time and condition ($F(2, 259)=2.84$, $p =.060$, $\eta^2=.021$) indicated SWL results differed across conditions. Post hoc tests reveal significant pairwise comparisons in the positive condition alone ($p= .013$), where SWL were higher after the completion of the PPI than before. It is important to note this interaction finding is a marginal effect, and thus not very reliable. Any conclusions drawn from this finding should be considered

cautiously.

Table 17

Study 3 Means and standard deviations for ANOVAs

	Condition			
	Positive	Neutral	Negative	Aggregate Conditions
PPI Attitudes				
Post-PPI	6.51 (2.22)	6.33 (2.36)	6.01 (2.28)	6.27 (2.29)
Feel				
Post-PPI	4.83 (1.09)	4.68 (1.11)	4.68 (1.01)	4.73 (1.07)
SWL				
Time 1	3.55 (1.43)	3.71 (1.56)	3.69 (1.42)	3.66 (1.47)
Time 2	3.65 (1.47)	3.77 (1.54)	3.67 (1.44)	3.70 (1.48)
Positive Mood				
Time 1	3.08 (0.94)	2.91 (1.12)	3.07 (1.12)	3.02 (1.07)
Time 2	3.13 (1.04)	3.07 (1.09)	3.14 (1.12)	3.11 (1.08)
Negative Mood				
Time 1	1.68 (0.95)	1.72 (1.01)	1.75 (1.07)	1.72 (1.01)
Time 2	1.66 (0.94)	1.63 (0.93)	1.75 (1.09)	1.68 (0.99)

Note: Values indicated are Means (Standard Deviations)

The second mixed ANOVA on positive mood revealed a main effect of time, $F(1, 259)= 9.31$, $p = .003$, $\eta^2=.035$, was significant, indicating that positive mood increased after the completion of the PPI compared to before (see table 17 for means). There was no significant interaction between time and condition ($F(2, 259)=1.00$, $p=.370$, $\eta^2=.008$) indicating positive mood change did not differ across conditions.

The third mixed ANOVA on negative mood revealed a non-significant main effect of time, $F(1, 259)=1.21$, $p=.272$, $\eta^2=.005$, indicating that negative mood did not differ after the completion of the PPI compared to before (see table 17 for all means). There was also no significant interaction between time and condition ($F(2, 259)=.67$, $p=.510$, $\eta^2=.005$) indicating negative mood change did not differ across conditions.

Implicit Theories of Happiness

In addition to the tests of condition differences, I also examined the same patterns of correlations evaluated in previous studies – both overall (all three conditions collapsed, Table 18) and separately by condition (Tables 19, 20, 21, for positive, neutral, and negative conditions, respectively). Although very few differences emerged across experimental conditions, it is possible that the relation between implicit theories and other variables will differ by condition[3].

Study 2 examined implicit theories of happiness as a predictor of PPIs opinions (post-completion), and mood change, and Study 3 aims to replicate those findings. This study found the same pattern of predictions as Study 2 (Table 18). The implicit theory scales largely predicted PPI attitudes. Again, none of the lay theories scales predicted a change in positive or negative mood, however, the PPI attitudes strongly predicted positive mood and self-perceptions of mood.

[3] Lay theories have been preliminarily tested as a moderator of condition. Results indicate that lay theories didn't moderate the central effects, and this was not a worthwhile path to investigate. For simplicity, I did not include these analyses, but I can if you feel them to be relevant.

Table 18

Means of all Scales and Correlations of all main variables, N=262

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. LT Control	4.21	.93	-								
2. LT Internal Locus	3.93	.83	.74***	-							
3. LT Flex	4.45	.82	.35***	.22***	-						
4. Dweck LT	4.28	1.06	.73***	.54***	.59***	-					
5. PPI Attitudes	6.27	2.28	.38***	.31***	.17**	.28***	-				
6. Feel	4.73	1.07	.16**	.12	-.12	.05	.55***	-			
7. SWL Difference	.04	.37	.04	-.003	-.03	.05	.15*	.22***	-		
8. Positive Mood Difference	.10	.50	.07	-.04	.001	.08	.25***	.36***	.32***	-	
9. Negative Mood Difference	-.04	.55	-.02	.05	.07	.01	.01	-.10	-.08	-.30***	-
10. PPI Past Experience	1.02	1.44	-.11	-.10	-.22***	-.20***	-.10	.08	-.08	-.03	-.05

*p < .05 **p < .01 ***p<.001

Note: *LT Control:* Lay theories of Happiness Controllability Subscale, *LT Internal Locus*: Lay theories of Happiness Internal Locus of control subscale, *LT Flex:* Lay theories of happiness Flexibility subscale, *Dweck LT*: Lay Theories of Happiness Scale Adapted from Dweck*, SWL Difference*: difference in pre and post satisfaction in life scale scores

PROCESS was used to test whether opinions regarding PPIs (using the aggregate of the opinions subscales) mediated a possible indirect relationship between implicit theories of happiness (using the controllability subscale) and positive mood, as I did in Study 2. Results suggested that implicit theories of happiness predicted attitudes regarding PPIs, b = .92, t = 6.27, p < .001, 95% CI [.632, 1.210], and accounted for 13% of the variance. Implicit theory of happiness was not a significant predictor of change in positive mood, b = .036, t = 1.08, p=.279, 95% CI [-.029, .101]. When opinions regarding PPIs was entered into the model, implicit

theories of happiness was still not a significant predictor of mood change, b = -.013, t = -.38, p=.702, 95% CI [-.082, .055], but opinions regarding PPIs was significant as a predictor of change in mood, b =.05, t = 3.92, p < .001, 95% CI [.027, .080]. This model accounted for 6% of the variance in positive mood. Results suggested that the indirect effect of implicit theories of happiness on positive mood change through opinions regarding PPIs (.05) was significant, BootCI [.023, .083]. The opinions regarding PPIs mediated the relationship between implicit theories of happiness and positive mood. Having a belief that happiness is not controllable predicts less positive opinions regarding PPIs which in turn predicts a lesser increase in positive mood.

Positive Condition

In the positive condition (table 19), a similar pattern of predictions to the overall correlations (table 18) was found. The controllability lay theory subscale strongly predicted PPI attitudes, while the other lay theory subscales were more mixed in predicting attitude. While lay theories did not predict positive mood, the controllability and Dweck adapted subscales did predict negative mood. Similar to previous studies, PPI attitude predicted positive mood. Attitude did not predict negative mood, and none of the items predicted participant's responses to the survey question regarding previously encountering PPIs.

Table 19

Positive Condition, Descriptive statistics and correlations among all variables: Study 3, N=78

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. LT Control	4.22	.98	-								
2. LT Internal Locus	3.85	.86	.71***	-							
3. LT Flex	4.53	.76	.33**	.12	-						
4. Dweck LT	4.34	1.05	.73***	.44***	.66***	-					
5. PPI Attitudes	6.50	2.21	.39***	.23*	.24*	.36***	-				
6. Feel	4.83	1.09	.31**	.19	-.08	.14	.67***	-			
7. SWL Difference	.11	.40	.14	.09	.01	.08	.17	.26*	-		
8. Positive Mood Difference	.05	.47	.18	-.07	.03	.20	.39***	.53***	.32**	-	
9. Negative Mood Difference	-.02	.49	-.24*	-.07	-.16	-.30**	-.07	-.22	-.03	-.37***	-
10. PPI Past Experience	.88	1.32	-.001	.04	-.20	-.08	-.08	-.03	.05	-.08	.02

*p < .05 **p < .01 ***p<.001

Note: *LT Control:* Lay theories of Happiness Controllability Subscale, *LT Internal Locus*: Lay theories of Happiness Internal Locus of control subscale, *LT Flex:* Lay theories of happiness Flexibility subscale, *Dweck LT*: Lay Theories of Happiness Scale Adapted from Dweck*, SWL Difference*: difference in pre and post satisfaction in life scale scores

Neutral Condition

In the neutral condition (table 20), lay theory subscales predicted PPI attitude; controllability again predicted this relationship the strongest while the other subscales were more varied. In this condition, neither lay theory subscales nor opinion subscales predicted mood. None of the items predicted responses to the survey question regarding past experience with PPIs.

Table 20

Neutral Condition, Descriptive statistics and correlations among all variables: Study 3, N=91

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. LT Control	4.21	.95	-								
2. LT Internal Locus	3.95	.80	.76***	-							
3. LT Flex	4.50	.88	.32**	.29**	-						
4. Dweck LT	4.23	1.13	.78***	.58***	.55***	-					
5. PPI Attitudes	6.33	2.36	.34***	.24*	.21*	.23*	-				
6. Feel	4.68	1.11	.12	.09	-.003	.07	.50***	-			
7. SWL Difference	.06	.31	-.13	-.02	-.05	-.07	.04	.17	-		
8. Positive Mood Difference	.15	.44	-.07	-.03	-.07	-.03	.08	.27**	.54***	-	
9. Negative Mood Difference	-.09	.66	.13	.12	.30**	.16	.06	-.06	-.16	-.30**	-
10. PPI Past Experience	1.04	1.47	-.11	-.17	-.20	-.16	-.06	.12	.05	-.03	-.09

*p < .05 **p < .01 ***p<.001

Note: *LT Control:* Lay theories of Happiness Controllability Subscale, *LT Internal Locus*: Lay theories of Happiness Internal Locus of control subscale, *LT Flex:* Lay theories of happiness Flexibility subscale, *Dweck LT*: Lay Theories of Happiness Scale Adapted from Dweck*, SWL Difference*: difference in pre and post satisfaction in life scale scores

Negative Condition

In the negative condition (table 21), results were more consistent with the positive condition. All lay theory scales predicted opinion subscales strongly, except flexibility which was less consistent. Once again, lay theory subscales did not predict mood, while also consistent with the positive condition, opinion subscales predicted positive mood. Unique to this condition is that having

reported to have participated in more PPIs in the past was *negatively* related to SWL, flexibility, the Dweck adapted scale, and the meaning subscale.

Table 21

Negative Condition, Descriptive statistics and correlations among all variables: Study 3, N=93

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. LT Control	4.19	.87	-								
2. LT Internal Locus	3.98	.84	.76***	-							
3. LT Flex	4.34	.81	.32**	.29**	-						
4. Dweck LT	4.28	1.02	.78***	.58***	.55***	-					
5. PPI Attitudes	6.01	2.26	.34***	.24*	.21*	.23*	-				
6. Feel	4.68	1.01	.12	.09	-.003	.07	.50***	-			
7. SWL Difference	-.03	.40	-.13	-.02	-.05	-.07	.04	.17	-		
8. Positive Mood Difference	.07	.57	-.07	-.03	-.07	-.03	.09	.27**	.54***	-	
9. Negative Mood Difference	-.003	.47	.13	.12	.30**	.16	.06	-.06	-.16	-.30**	-
10. PPI Past Experience	1.11	1.51	-.11	-.17	-.20	-.16	-.06	.12	.05	-.03	-.09

*p < .05 **p < .01 ***p<.001

Note: *LT Control:* Lay theories of Happiness Controllability Subscale, *LT Internal Locus*: Lay theories of Happiness Internal Locus of control subscale, *LT Flex:* Lay theories of happiness Flexibility subscale, *Dweck LT*: Lay Theories of Happiness Scale Adapted from Dweck*, SWL Difference*: difference in pre and post satisfaction in life scale scores

Discussion

Study 2 revealed that incremental theorists have more positive attitudes toward PPIs (seeing them as more meaningful and effective), and that positive PPI attitudes predicted increased positive mood post-PPI. I speculated that implicit theories may alter

people's expectations about PPI effectiveness, thereby altering their task engagement and subsequent positive mood. In Study 3, I reasoned that if implicit theories work by altering expectancy (which mediates an indirect effect on mood), then a complementary approach would be to manipulate the possible mediator by experimentally altering PPI expectancy. If people go into the task expecting it to be effective (in this case, because they were provided this information in the instructions), they might engage more deeply and benefit more. Likewise, approaching the activities with a skeptical or diminished belief in their effectiveness may impair the effects the PPIs have due to expectancy.

This study found that by and large, the experimental effect of the expectancy manipulation had little effect. Positive mood and satisfaction with life increased overall, but only in one case (SWL) was there a particular increase in the positive condition (the interaction effect was marginal). The condition also had very little effect on opinion variables, which is important because it suggests that despite efforts to alter expectations, the instructions failed to measurably affect people's actual impressions of PPI effectiveness. Overall, I cannot conclude strongly whether expectancy effects might play the hypothesized role if more successfully manipulated, or if they are unlikely to have the hypothesized effects. In contrast, individuals' chronic lay theories about the controllability of happiness continued to be a significant predictor across the three conditions. Despite a few inconsistent effects in the large number of correlations, overall the results speak to the power of people's pre-existing beliefs about whether happiness is within their control- this belief may even be stronger than instructions about the effectiveness of the PPI (since incremental theorists believed the PPI to be more effective than entity theorists, regardless of instructions).

In replicating the findings of Study 2 as a whole, the same indirect pattern of prediction was found, that lay theories did not directly predict mood, but lay theories predicted positive attitudes towards PPIs, which predicted increased positive mood. This supports Study 2's finding that may suggest that there is a more indirect and nuanced relationship between lay theories and mood that operates via attitudes. However, in the neutral condition, which is the most direct replication of the prior study, it is notable that the pattern of correlations does not show the indirect effect. While lay theories predict positive attitudes towards PPIs, attitudes does not predict mood. There is no compelling methodological reason for this discrepancy; however, this may be due to the lower number of participants in this condition (N=91) as compared to Study 2 (N=295) reading to a less stable effect.

This study also found the same unexpected result as Study 2 where individuals with an entity or 'happiness is not controllable' belief reported having experienced PPIs more in their past than those who believe that happiness is controllable This possible relationship between beliefs and the behaviours that seem incongruent with those beliefs may need further consideration to evaluate why this relationship exists, and if past experiences with PPIs may be a possible predictor for a more entity belief about happiness.

Study 4

Background

Although the results of Studies 1-3 identify the important role of implicit theories of happiness in identifying the boundary conditions of PPI effectiveness, the findings are limited by the correlational nature of the results. Individual differences in implicit theories of happiness

are likely to be related to a host of other individual difference variables which could indirectly be responsible for some of the findings reported here. Although I controlled for life satisfaction to rule out its potential as an alternative explanation to implicit theories, it is also desirable to manipulate implicit theories to examine its causal effect. This has dual benefits of advancing theory by more clearly testing the role of implicit theories while holding other factors constant, and also tests a possible technique that could enhance the effectiveness of PPIs (by combining them with information that instills a more incremental view of happiness). Thus, Study 4 aims to experimentally test the findings of the previous studies, by manipulating the implicit theory a person holds towards happiness. While chronic implicit theories are powerful lenses through which people see the world, these beliefs are not set in stone. People can be provided persuasive information that leads them to temporarily adopt a different implicit theory, allowing the causal role of these theories to be tested (Howell, Passmore, & Holder, 2016).

Participants were randomly assigned to read an article explaining that happiness is highly changeable (or in a second group, happiness is highly fixed and unchangeable), adapting articles used by Howell, Passmore, and Holder (2016; see Appendix E for Study 4 materials). Based on Studies 1-3, I hypothesized that participants in the incremental (happiness is controllable) condition will show greater enthusiasm and engagement with the intervention, which in turn will be more effective and have a greater impact on mood than the entity (happiness is not controllable) condition.

Method

Participants

For this study, 220 American participants in total were recruited through Amazon's Mechanical Turk. Participants were compensated $1.00 USD for their participation. Thirty participants were excluded for failing attention checks, and an additional 13 were excluded for failing the manipulation test resulting in a total number of 177 participants. 66.7% of participants were male, and ages ranged from 20 to 73 (M = 33.9, SD = 8.26). Most participants were Caucasian, Non-Hispanic White, or Euro-American (66.7%), and the average current household income reported was between $40,000 and $50,000.

Procedure

Initially, participants were told they were completing measures of personality and individual differences, to understand responses to well-known psychological activities. Similar to Study 2 and 3, they first completed a consent form, measures of demographics, and then a measure of baseline mood (Positive Mood α= .89, Negative Mood α= .94), a measure of baseline Satisfaction with Life using the OECD satisfaction with life question (OECD, 2013), and two pre-test Lay Theories of Happiness Controllability subscale items (Tullet & Plaks, 2016), with one item gauging incremental beliefs (that happiness is controllable) and one item to gauge entity beliefs (that happiness is not controllable). This pretest was to provide a brief baseline to use as a covariate when evaluating the post-lay theories scale, to account for individual difference variance and to ensure that random assignment to condition was successful for this variable at baseline. These lay theory items were hidden within irrelevant

filler questions evaluating self-construal (Gundykunst & Lee, 2003), to minimize the chance of priming certain beliefs in individuals (See Appendix E for full measures).

Per the manipulation, participants were randomly assigned to read one of two fake news articles, one claiming that happiness is not controllable (Entity condition), and the other that happiness is controllable (Incremental condition; see Appendix E for full article text). Participants then completed the 'Three good things' positive psychological intervention. They then completed the same mood and SWL measures as before, and then answered opinion questions on their attitudes towards completing the PPI, as was asked in Studies 2 and 3. Next, participants completed a manipulation check comprising of the controllability subscale from the lay theories of happiness scale (Tullett & Plaks, 2016). As this scale was included for the purpose of evaluating if the manipulation worked, only the scale that is most directly linked to the manipulation's message (that happiness is (not) controllable), was included.

Finally, participants were asked several survey questions, including a measure of how easy it was to complete the PPI, a suspicion probe evaluating the participants' belief in the veracity of the experimental articles, and as was included in the previous studies, a question asking if they had experienced PPIs in the past. Participants were then debriefed and told the true nature of the study and the articles.

Materials

OECD. This single item, internationally used measure provides a simplified initial assessment of pre-test and post-test satisfaction with life (SWL) and was selected as a briefer measure. This core question was developed to be part of a minimal set of measures of

subjective happiness that could be included in household surveys, with the goal of international comparability, while imposing the minimum level of respondent burden (OECD, 2013). While the question is sometimes used as part of a larger scale, it is designed to also stand alone and serve as a primary measure of subjective happiness when a single item measure is required. This satisfaction with life question was based on that used in the World Values Survey, but amended to use a 1 to 10 scale (OECD, 2013).

Results

Study 4 aimed to experimentally manipulate the implicit theories of happiness participants hold to understand the link between these beliefs and people's response to PPIs; the results for this study are reported in three sections. The first explores how key variables differ across the experimental conditions (incremental and entity) and time (pre-PPI and post-PPI). The second section is devoted to exploring the role of individual differences in implicit theories of happiness in this study and attempting to replicate the indirect relationship found in Studies 2-3 between implicit theories, opinions of PPIs, and positive mood. Finally, the third section examines correlations between key variables, broken down by condition.

Condition Effects

To first test if random assignment was successful, a between-subjects ANOVA compared pre-manipulation chronic lay theory responses across experimental conditions (entity and incremental). There was no significant main effect of condition, $F(1, 177)= .230$, $p=.632$, $\eta^2=.001$ between the entity condition ($M=4.13$, $SD=1.04$) and the incremental condition ($M=4.06$, $SD=1.12$), indicating that participants were successfully randomly assigned.

Next, to evaluate the manipulation of participants' lay theories, a one-way ANCOVA was conducted to examine the effect of Article Condition (entity, incremental) on the dependent variable of post-manipulation lay theories, controlling for pre-manipulation chronic lay theories. Participants in the entity condition had a less controllable lay theory of happiness after the manipulation (M_{adj}=4.10, *SE*=.075) compared to the incremental condition (M_{adj}=4.36, *SE*=.066) when pre-manipulation chronic lay theories was held constant, indicating participants' lay theories were successfully manipulated, F(1, 177)=6.94, p<.001, η^2=.038.

A Time (Pre, Post) x Article Condition (incremental, entity) mixed ANOVA evaluated if satisfaction with life changed from baseline after participants completed the PPI, and if that differed by condition. A main effect of time, F(1, 174)= 4.13, p=.044, η^2= .023, indicated that SWL was higher after the completion of the PPI, but the non-significant interaction indicated that this pattern did not differ by condition (F(1, 174)= .88, p= .349, η^2=.005) (see table 22 for means).

The second mixed ANOVA evaluated if positive mood changed from before to after the PPI was completed, and if this change differed across condition. Positive mood did not differ from baseline after the completion of the PPI (F(1, 175)= 1.85, p= .175, η^2= .010), and it did not differ across conditions, as there was no significant interaction between time and condition (F(1, 175)= .141, p= .708, η^2= .001) (see table 22 for all means).

Table 22

Study 4 Means and standard deviations for ANOVAs

	Condition		
	Entity	Incremental	Overall
SWL			
Time 1	8.60 (2.08)	8.20 (2.38)	8.37 (2.25)
Time 2	8.70 (1.98)	8.48 (2.29)	8.58 (2.16)
Positive Mood			
Time 1	7.18 (2.15)	6.94 (2.17)	7.05 (2.16)
Time 2	7.32 (2.08)	7.01 (2.20)	7.15 (2.15)
Negative Mood			
Time 1	3.66 (2.81)	4.05 (3.08)	3.88 (2.96)
Time 2	3.74 (2.94)	4.07 (3.22)	3.92 (3.09)

Note: Values indicated are Means (Standard Deviations)

The third mixed ANOVA evaluated if negative mood changed after the PPI was completed, and if this change differed across condition. Negative mood did not differ from baseline after the completion of the PPI, F(1, 175)= .29, p= .589, η^2= .002, and it did not differ across conditions, as there was no significant interaction between time and condition (F(1, 175)= .11, p= .741, η^2= .001) (see table 22 for all means).

Finally, to evaluate if participants' opinions towards the PPI differed across experimental conditions, a one-way ANCOVA, controlling for pre-manipulation chronic lay theories, revealed that participants in the entity condition (M_{adj}=5.59, SE=.136) did not have different opinions towards the PPI compared to the incremental condition (M_{adj}=5.37, SE=.119), F(1, 175)=1.47, p=.226, η^2=.009. This indicates that participants' behaviour in responding to PPIs was not

different across the experimental conditions.

Individual Differences in Implicit Theories of Happiness

Although Study 4 was experimental, given the lack of experimental effects on key DVs I also examined correlations between implicit theories and DVs. Study 2 and 3 examined individual differences in implicit theories of happiness as a predictor of the opinions towards PPIs, and mood change, and Study 4 replicates those findings (table 23). This study found the same pattern of predictions as Studies 2 and 3, as the lay theory controllability subscale predicted PPI opinion. Again, the lay theories subscale did not predict a change in positive or negative mood, however, PPI opinion scores strongly predicted positive mood change and self-perceptions of mood ('feel' item). Additionally, a greater incremental, or 'happiness is controllable' belief predicted higher ratings of ease or fluency with completing the PPI, while a greater entity, or 'happiness is not controllable' belief predicted greater responses that one had experienced PPIs in the past.

Table 23

All conditions, All means and correlations between main variables, N=177

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. LT Controllability	4.24	0.89	-						
2. PPI Opinion	6.61	1.71	.33***	-					
3. Difference SWL	0.20	1.25	.06	.13	-				
4. Difference Positive Mood	0.10	1.03	.03	.31***	.51***	-			
5. Difference Negative Mood	0.04	1.16	-.02	-.14	.09	-.26***	-		
6. Feel Question	5.47	1.18	.09	.45***	.28***	.16*	.04	-	
7. Ease/Fluency	3.92	1.79	.35***	.29***	.04	.13	-.07	-.19*	-
8. Previous Experiences	1.63	1.91	-.31***	-.24**	-.17*	-.21	.05	.15	.45***

*p < .05 **p < .01 ***p<.001

Note: Difference scale scores are post-PPI scores subtracted from pre-PPI scores

PROCESS was used to test whether opinions regarding PPIs mediated a possible indirect relationship between implicit theories of happiness (using the controllability subscale) and positive mood. Results suggested that implicit theories of happiness predicted opinions regarding PPIs, b = .60, t = 4.54, p < .001, 95% CI [.337, .856], and accounted for 10% of the variance. Implicit theory of happiness was not a significant predictor of change in positive mood, b = .03, t = .36, p=.718, 95% CI [-.130, .188]. When opinions regarding PPIs was entered into the model, implicit theories of happiness was still not significant predictor of mood change, b = -.08, t = -.96, p=.340, 95% CI [-.238, .083], but opinions regarding PPIs was significant as a predictor of change in mood, b =.18, t = 4.19,

$p < .001$, 95% CI [.095, .264]. This model accounted for 9% of the variance in positive mood. Results suggested that the indirect effect of implicit theories of happiness on positive mood change through opinions regarding PPIs (.11) was significant, BootCI [.038, .195]. As in Studies 2-3, the opinions held regarding PPIs mediated the relationship between implicit theories of happiness and positive mood. Additionally, having a belief that happiness is not controllable predicts less positive opinions regarding PPIs which in turn predicts a lesser increase in positive mood.

Correlations by Experimental Conditions

Looking at the main variables by condition, the entity and incremental conditions show similar patterns in the relationships between variables. Considering first those in the entity condition, which aimed to endorse the belief in participants that happiness is not controllable (table 24), lay theory controllability subscale scores predicted PPI opinion in the same pattern as the aggregate condition effects (table 23). Like previous studies, lay theory responses did not predict mood. PPI opinion did not predict mood as consistently as the aggregate condition effects. Additionally, ease or fluency with the PPIs was predicted by the lay theories controllability subscale, but participants past experience or participation with PPIs was not predicted the lay theories controllability subscale.

Table 24

Entity condition, All correlations between main variables, N=78

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. LT Controllability	4.12	0.85	-						
2. PPI Opinion	6.89	1.34	.38***	-					
3. Difference SWL	0.10	0.95	.06	.08	-				
4. Difference Positive Mood	0.14	0.98	-.04	.24*	.29**	-			
5. Difference Negative Mood	0.08	1.23	.06	-.10	.19	-.31**	-		
6. Feel Question	5.59	1.09	.17	.29*	.34**	-.06	-.02	-	
7. Ease/Fluency	3.92	1.86	.35***	.42***	.04	.21	.04	-.18	-
8. Previous Experiences	1.56	1.88	-.13	-.38***	.05	-.18	.09	.22	.49***

*p < .05 **p < .01 ***p<.001

Note: Difference scale scores are post-PPI scores subtracted from pre-PPI scores

Next, considering those in the incremental condition (table 25), that aimed to endorse the belief in participants that happiness is controllable, lay theory controllability subscale scores again predicted PPI opinion as the aggregate condition effects did (table 23). Like previous studies, lay theories did not predict mood, but positive mood was predicted by PPI opinion. Additionally, ease or fluency with the PPIs was predicted by the lay theories controllability subscale, and whether the participants had experienced or participated in PPIs in the past was predicted by lower rating of happiness as controllable, as was found in Studies 2 and 3.

Table 25

Incremental condition, All correlations between main variables, N=99

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. LT Controllability	4.34	0.92	-						
2. PPI Opinion	6.39	1.92	.35**	-					
3.Difference SWL	0.28	1.44	.05	.17	-				
4. Difference Positive Mood	0.08	1.07	.09	.35***	.63***	-			
5. Difference Negative Mood	0.02	1.12	-.08	-19	.04	-.22*	-		
6. Feel Question	5.37	1.25	.07	.53***	.27**	.28**	.08	-	
7. Ease/Fluency	3.92	1.75	.36***	.22*	.03	.07	-.18	.20	-
8. Previous Experiences	1.69	1.94	-.44***	-.17	-.28**	.23*	.03	.11	.42***

*p < .05 **p < .01 ***p<.001

Note: Difference scale scores are post-PPI scores subtracted from pre-PPI scores

Discussion

Study 4 aimed to manipulate lay theories to endorse a belief that (in condition 1: entity) happiness is not controllable by oneself, or (in condition 2: incremental) that happiness is something one can control to experimentally test the effects different lay theories may have on the attitudes towards and outcomes of PPIs. Despite a successful manipulation of lay theory belief responses, condition differences were not found in participants' PPI opinions or affective reactions. This unexpected finding may be due to a

multitude of reasons, for example that the chronic lay theory one has is a strongly rooted belief and while persuasive information could get people to question that belief and respond to specific questions on that topic accordingly, a much stronger manipulation may be needed to change that belief enough that people then use a new belief to interact with the world and alter their behaviour. Future studies may examine these reasons more closely, and those that wish to manipulate lay theories may need to consider more persuasive or interactive methods of endorsing the beliefs so they reliably affect responding and behaviour.

It is also worth noting that this study found less evidence for a successful PPI than prior studies. The single item SWL measure was somewhat higher after the PPI than before, but the mood measures showed no effect. This relatively weak effect of the PPI might have had to do with first reading the bogus articles, or it may simply be natural variation in effect size. It is possible that the weak effectiveness of the PPI made it more difficult to detect an effect of the implicit theories condition.

This study had two additional findings to consider. The first being that Study 2 and 3's pattern of results were again replicated, and the indirect relationship of lay theories of happiness predicting opinion towards PPIs, which then predicted an increase in positive mood was present in the results of this study. Second, an incremental belief in the controllability of happiness predicted greater ease and fluency with PPIs. It is conceivable that people who view the activities that are congruent with their beliefs more favourably may also have an easier or more natural time engaging in them. It was also found, however, that an entity belief predicted more past experiences with PPIs. While it is beyond the scope of this package of studies, future

research should delve into the possible impact fluency has on those who engage in PPIs, as this may be a possible reason behind why past experience with PPIs is predicted by entity beliefs. If entity theorists have done PPIs in the past but tended to experience lower fluency, the subjective difficulty of the PPI might have provided information to them that they interpreted as indicating a lack of success. Past research has shown that when a PPI was experienced as difficult (low fluency), it failed to have a positive effect on the respondent (Hunt, 2018).

General Discussion

The current research contributes to the emerging analysis of positive psychological interventions (PPIs) beyond one-size-fits-all (Lyubomirsky & Layous, 2013; Sergeant & Mongrain, 2014); I focus on implicit theories about the controllability of happiness as an individual difference that may inform boundary conditions on PPI effectiveness. The beliefs people hold may impact the way they interact with every facet of life, and the current research has demonstrated that the implicit theories of happiness one holds may be an important variable predicting how PPIs are perceived, approached, and potentially engaged with. When individuals' considered PPIs without actually doing them, people who believed that happiness was more controllable judged the PPIs more favourably (Study 1) and expected that the PPIs would make them feel more positively. When participants actually completed the PPIs, those who saw happiness as controllable again judged PPIs more positively (after completion rather than in expectation as in Study 1), and positive opinions of the PPIs predicted better mood. Implicit theories did not directly predict mood after PPI completion, but indirectly predicted mood via PPI opinions (Study 2, 3, and 4). In the final two studies, I also attempted to

experimentally alter a) task expectancy and b) implicit theories of controllability. Neither manipulation showed much effect, but chronic implicit theories continued to predict outcomes.

Implications

My research investigates a new boundary condition of PPIs that may need to be considered when researching or engaging in PPIs. This complements previous findings that explore the boundary conditions that limit the universal effectiveness of PPIs (Lyubomirsky & Layous, 2013; Layous & Lyubomirsky, 2012; Sergeant & Mongrain, 2014), and furthers them by examining a different facet of attitudes and beliefs. My findings provide a novel contribution by demonstrating that, with regard to happiness activities, all individuals are not approaching them the same way. The beliefs surrounding happiness they hold does alter the opinions they have of PPIs, and that in turn, may alter the effectiveness of the PPIs and the power PPIs have on improving positive attributes, like mood.

It is worth noting that the effectiveness of PPIs on outcome DVs did differ across PPIs. Some PPIs appeared to be more effective than others (at least as indicated by more positive affect following the PPI than before). Although PPI effectiveness was not required in order to examine the question of individual differences in PPI responses. It may have been more difficult to detect individual differences if a PPI did not reliably elicit the intended effect. There may be several reasons why PPIs were not always effective. First, it may be that the different positive activities are not all equally likely to affect my DVs (mood, SWL) in a uniform way; different PPIs focus on different positive topics, and are designed to promote flourishing in diverse ways. Thus my consistent measure of DVs across PPIs may not have captured the outcomes of different

PPIs completely. Second, the current studies were conducted in single sessions and online with non-self-selected people, all conditions that may be less than optimal for highest-impact PPI effects. Finally, it is possible that some PPIs are simply less effective than the past literature has suggested, perhaps due to publication bias and lack of attention to moderators and boundary conditions.

In all, based on the current findings, I postulate that much more consideration needs to be made into what variables impact PPIs, in an effort to better understand their scope and limits, and to further the knowledge about the nature of happiness and what impacts or improves it, on an individual level, as well as how one's beliefs alter the way they approach and experience the world.

Limitations

The first potential limitation of this work is the correlational nature of all the studies. Two studies were purely correlational and two contained manipulations that showed little effect (hence correlational links with implicit theories were examined in all four). All the findings thus far must be considered cautiously, as the causal relationship between any of the variables cannot be firmly stated through these studies. I set out to examine the relationships between implicit theories of happiness and positive psychological interventions, so further experimental research is needed to strengthen and extend the findings and claims discovered in the current studies, especially as the attempt to demonstrate these relationships experimentally (Study 4), was not effective. For future experimental work, the strength of

manipulations and measures used must be considered carefully, as the strength of the manipulation used in Study 4 may have been a limit of the experimental design.

Across the studies, the demographics of the sample were largely the same and predominantly Caucasian, between the ages of 20-50, and American. While this was a limitation of the method of sampling chosen and the platforms used to recruit participants, the findings cannot be purported to be universally or cross-culturally valid. Further research and replications may need to be done to understand the relevance and breadth of these findings for all populations and cultures.

Further, there were several aspects of the research methodology that may have limited the findings. Firstly, all studies were conducted online. The lack of a standard, controlled environment may have limited the focus given to the research by participants. Similarly, participants may not have necessarily been motivated to complete the tasks to the best of their abilities, given this was an online study, and participants were compensated for their time. This may have incentivized participants to complete the studies quickly but not thoroughly. Second, as participants may not have been entirely focused and motivated to complete the tasks, the manipulations included in the current research were quite subtle, perhaps too subtle for the participants, especially as the manipulations did not show the intended effects in Studies 3-4. Finally, the outcome DVs were evaluated after a single session of the PPI, not a repeated practice. Researchers have argued that PPIs may be more effective or lastingly effective if completed regularly as a practice, and effects may not be eminent after a single session (Seligman, *et al.*, 2005). The predictions on the DVs and relationships between variables found

in the current research may be different, and potentially stronger, if PPIs were practiced regularly and not as a single session.

Future Directions

While the current research investigates the implicit theories of happiness individuals hold and the links that may have with PPIs, implicit theories are merely a subset of all the attitudes and beliefs humans hold. Future research could consider any number of attitudes and beliefs and examine how those impact positive psychological interventions. Specifically, attitudes towards the perceived authenticity of the PPIs may be a potential boundary condition; as well as fluency or ease with PPIs, as these two variables may be closely tied or related (Study 4); or individual past experiences, especially past experience in therapy or similar contexts that may influence the perception an individual has regarding PPIs.

Next, the fit of a PPI with an individual's implicit theory of happiness is an aspect that should be evaluated in future research. The PPIs evaluated in the current studies emerged with varying effectiveness, and a plausible thought for why is that some PPIs may be phrased or designed in a way that is better for an incremental theorist, or is better for an entity theorist. For example, a Best Possible Self PPI could be more effective for an incremental theorist, as it focusses on how one can grow or improve themselves in the future, and this is congruent with an incremental theorist's beliefs. However, it is less congruent with an entity theorist's beliefs, unlike a Signature Strengths PPI, which encourages participants not to change, but to harness the strengths they already possess. This activity may be more natural and in line with the beliefs entity theorists hold, and thus this may result in more effective or positively viewed PPIs.

Future studies could also examine how lay theories of happiness are formed: do they precede happiness change attempts, or do they get formed by tried and successful or failed attempts? Knowing what aspects and variables affect which theory individuals prescribe to and what these beliefs are rooted in (eg. fact and personal experience, specific life events, or just personally thought out beliefs) may be key to manipulating them successfully. Further, examining the role that PPIs play in the formation or adoption of a controllability belief may also be a worthwhile investigation. Studies 3 and 4 found that an entity belief predicted a greater number of past experiences with PPIs, thus it may be worthwhile to examine if PPIs may be a part of the adoption of an entity belief. This leads to the question of why: is the adoption of this belief an outcome of an ineffective PPI, is it a product of a lack of lasting effect from a PPI, or is it perhaps disenchantment with the whole notion from an experience with a PPI that was then deemed 'silly' or 'a waste of time'? Addressing these questions may further impact the boundary conditions of PPIs and the care and consideration that may need to go into which populations PPIs are administered to.

Finally, as the current research was exploratory, future research could further investigate the indirect relationship between implicit theories of happiness, opinions towards PPIs, and positive mood more deeply. This indirect link may work as a self-fulfilling prophecy, where those with an incremental implicit theory of happiness may view PPIs more favourably, thus they may put more time and effort into completing them, engaging in them more deeply, and so the PPIs may produce a greater positive effect as a result. Upon viewing a positive outcome of the PPI, the individual's beliefs in the controllability of happiness may then be reinforced. Likewise, those with an entity implicit theory of happiness my view PPIs less

favourably, as they are activities incongruent with their beliefs. So, they may put less time and effort in the activities, engaging in them less deeply. So, the PPIs may produce little or no effect, and upon viewing this lack of effect, individual's view of happiness not being controllable may also be reinforced. This may be a reason there is no direct link between implicit theory and mood, perhaps the controllability of happiness belief is expressed through the attitudes and opinions an individual approaches situations and activities with. So this belief may not impact mood or similar outcomes directly, but through the indirect mechanism of attitude.

In sum, the current research aimed to understand a facet of individual differences that influences the way people view and interact with activities designed to influence their happiness. In this research, I found that people's beliefs about how controllable happiness is predicted their beliefs and expectations about the interest value, effectiveness, and meaningfulness or positive psychological interventions, and these beliefs in turn predicted the positive effects they experienced. Thus, the individually different ways people see the world can shape their experience of it, and may prompt the kinds of behaviours that increase the likelihood that their initial beliefs will indeed be supported.

Appendix A

Supplemental Results

Table 26

Correlations of main variables for Study 1, with sample included as a covariate, (SWL + sample as covariates), N= 163

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. LT Controllability	4.39	.88	-						
2. LT Internal Locus	3.93	.88	.612***	-					
3. LT Flexibility	4.67	.76	.404***	.094	-				
4. PPI Interest	6.47	1.59	.279***	.213**	.069	-			
5. PPI Meaning	7.35	1.50	.366***	.241**	.259***	.800***	-		
6. PPI Effective	6.47	1.86	.318***	.273***	.053	.830***	.800***	-	
7. Aggregate Attitudes	6.83	1.54	.331***	.253***	.131	.936***	.925***	.936***	-
8. Feel Question	5.19	.83	.339***	.240**	.211**	.742***	.718***	.723***	.783***

*p < .05 **p < .01 ***p<.001

Table 27

Study 2 Correlations presented without controlling for Satisfaction with Life, N=292

Variables	1	2	3	4	5	6	7	8	9	10
1. SWL	-									
2. LT Controllability	.372***	-								
3. LT Locus Internal	.369***	.794***	-							

4. LT Flexibility	.036	.436***	.356***	-						
5. Interest	.336***	.254***	.224***	.098	-					
6. Meaning	.280***	.298***	.243***	.175**	.780***	-				
7. Effective	.348***	.170**	.168**	-.018	.750***	.679***	-			
8. Feel	.191***	.126*	.098	-.013	.427***	.331***	.528***	-		
9. Difference Positive Mood	-.051	.036	.085	.040	.272***	.236***	.351***	.493***	-	
10. Difference Negative Mood	-.008	-.005	-.020	-.103	-.181**	-.216***	-.160**	-.301***	-.281***	-
11. Word Count	.029	.199***	.188***	214***	.058	.178**	.081	.014	.119*	.086

*p < .05 **p < .01 ***p<.001

Study 2: All result tables with the PPI attitudes scale divided into subscales.

Table 28

Means of Opinion Subscales by PPIs, N=291

	Interventions, Means (Standard Deviations)			
Response Subscales	Three Good Things	Silver Linings	Best Possible Selves	PPIs Combined
Interest	6.81 (2.13)	6.76 (2.09)	6.45 (2.27)	6.69 (2.15)
Profound	6.96 (1.90)	6.70 (1.94)	6.86 (2.08)	6.94 (1.96)
Effective	6.26 (2.72)	6.14 (2.72)	6.50 (2.60)	6.28 (2.69)
PPI Attitudes	6.68 (2.05)	6.60 (2.02)	6.60 (2.12)	6.63 (2.06)
Feel	4.96 (1.11)	4.75 (1.18)	4.8 (1.48)	4.84 (1.25)

Note: *PPI Attitudes* is an aggregate of Interest, Meaning, and Effective subscales

Table 29

Correlations between Satisfaction with Life Scores, PPI Opinion and Implicit Theories of Happiness subscale items, N=291

	Opinion and Implicit Theory Subscales						
Variable	Interest	Meaning	Effective	Feel	Controllability	Internal Locus	Flexibility
SWL	.33***	.28***	.34***	.19**	.37***	.37***	.04

*p < .05 **p < .01 ***p<.001

Table 30

Correlations of all variables, with combined intervention responses, controlling for SWL, N=289

	Combined Intervention Responses							
Subscales	Interest	Meaning	Effective	PPI Attitudes	Feel	Difference Positive Mood	Difference Negative Mood	Word Count Total
Controllability	.15*	.22***	.05	.14*	.06	.06	-.002	.20***
Internal Locus	.11	.16**	.05	.11	.03	.11	-.02	.19***
Flexibility	.09	.17**	-.03	.07	-.02	.04	-.10	.21***
Interest					.39***	.31***	-.19**	.05
Meaning					.29***	.26***	-.22***	.18**
Effective					.50***	.39***	-.17**	.08
PPI Attitudes					.45***	.37***	-.21***	.11
Feel						.51***	-.31***	.01

*p < .05 **p < .01 ***p<.001

Note: *Difference Positive Mood* and *Difference Negative Mood* are difference scores, generated by subtracting post-PPI mood scores from the baseline mood scores

Table 31

Finding Silver Linings PPI condition, correlations with all variables, controlling for SWL Scale, N=109

	Finding Silver Linings PPI Responses							
Subscales	PPI Interest	PPI Meaning	PPI Effective	WC All	WC Answ	Feel	Difference Positive Mood	Difference Negative Mood
Controllability	.16	.28**	-.001	.10	.20	.06	-.02	-.15
Internal Locus	.15	.22*	.05	.04	.12	-.01	.07	-.06
Flexibility	.04	.20*	-.06	.14	.23	-.07	.01	-.22*
PPI Interest				.15	.11	.22*	.26**	-.03
PPI Meaning				.10	.21	.19*	.17	-.14
PPI Effective				.11	.04	.40***	.37***	-.04

*p < .05 **p < .01 ***p<.001

note: WC All is the word count for all the answers of the PPI, and WC Answ is the word count excluding question 1 of the PPI which asks the participant to describe a small negative event from their day. Items 2, 3, and 4 are the positive items that contain the positive aspect of the PPI.

Table 32

Best Possible Self PPI condition, correlations with all variables, controlling for SWL Scale, N=79

	Best Possible Self PPI Responses						
Subscales	PPI Interest	PPI Meaning	PPI Effective	Word Count	Feel	Difference Positive Mood	Difference Negative Mood
Controllability	-.05	.10	-.15	.35**	-.05	.08	.14
Internal Locus	-.04	.04	-.15	.26*	-.14	.07	.05
Flexibility	.07	.17	-.04	.41***	-.02	.07	-.03
PPI Interest				.02	.46***	.46***	-.31**

PPI Meaning	.291**	.30**	.40***	-.28*
PPI Effective	-.02	.52***	.43***	-.24*

*p < .05 **p < .01 ***p<.001

Table 33

Three Good Things PPI condition, correlations with all variables, controlling for SWL Scale, N=97

	Three Good Things PPI Responses						
	PPI Interest	PPI Meaning	PPI Effective	Word Count	Feel	Difference Positive Mood	Difference Negative Mood
Controllability	.31**	.27**	.27**	.25*	.16	.11	.01
Internal Locus	.21*	.20*	.20*	.25*	.22*	.17	-.02
Flexibility	.19	.15	.03	.19	.04	.07	-.08
PPI Interest				.17	.51***	.25*	-.25*
PPI Meaning				.16	.43***	.24*	-.27**
PPI Effective				.15	.61***	.44***	-.29**

*p < .05 **p < .01 ***p<.001

Table 34

Correlations of Lay Theories of Happiness Subscales and Opinion subscales with PPI experience question, Controlling for SWL, N=288

Variables	Survey Question
Controllability	-.23***
Internal Locus	-.16**

Flexibility	-.27***
Interest	-.07
Meaning	-.14*
Effective	.13*
PPI Attitudes	-.01
Feel	.03

*p < .05 **p < .01 ***p<.001

Study 3: All result tables with the PPI attitudes scale divided into subscales.

Table 35

Means of all Scales and Correlations of all main variables, N=262

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. SWL	.04	.37	-										
2. LT Control	4.21	.93	.039	-									
3. LT Internal Locus	3.93	.83	-.003	.742***	-								
4. LT Flex	4.45	.82	-.029	.345***	.216***	-							
5. Dweck LT	4.28	1.06	.047	.727***	.536***	.585***	-						
6. PPI Interest	6.20	2.44	.130*	.339***	.281***	.136*	.237***	-					
7. PPI Perceived Meaning	6.47	2.27	.146*	.389***	.305***	.270***	.333***	.808***	-				
8. PPI Effective	5.94	2.96	.131*	.288***	.250***	-.023	.145*	.820***	.690****	-			
9. Feel Question	4.73	1.07	.224***	.161**	.117	-.116	.052	.529***	.431***	.624***	-		
10. Positive Mood	.10	.50	.316***	.067	-.040	.001	.081	.220***	.263***	.201***	.363***	-	
11.Negative Mood	-.04	.55	-.084	-.018	.047	.071	.010	.010	-.003	.026	-.103	-.298***	-
12. Past PPI Experience	1.02	1.44	-.076	-.106	-.101	-.224***	-.202	-.082	-.200***	.118	.078	-.029	-.046

*p < .05 **p < .01 ***p<.001

Note: *SWL*: difference in pre and post satisfaction in life scale scores, *LT Control:* Lay theories of Happiness Controllability Subscale, *LT Internal Locus*: Lay theories of Happiness Internal Locus of control subscale, *LT Flex:* Lay theories of happiness Flexibility subscale, *Dweck LT*: Lay Theories of Happiness Scale Adapted from Dweck*, PPI Interest*: PPI Opinion Scale Interest subscale, *PPI Perceived Meaning*: PPI Opinion Scale Perceived Meaningfulness subscale, *PPI Effective*: PPI Opinion Scale Effectiveness subscale

Table 36

Positive Condition, Descriptive statistics and correlations among all variables: Study 3, N=78

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. SWL	.11	.40	-										
2. LT Control	4.22	.98	.143	-									
3. LT Internal Locus	3.85	.86	.086	.709***	-								
4. LT Flex	4.53	.76	.011	.325**	.116	-							
5. Dweck LT	4.34	1.05	.079	.725***	.441***	.655***	-						
6. PPI Interest	6.35	2.34	.148	.300**	.189	.159	.250*	-					
7. PPI Perceived Meaning	6.78	2.18	.172	.418***	.194	.367***	.447***	.802***	-				
8. PPI Effective	6.19	2.92	.135	.400***	.297**	.071	.277*	.872***	.692***	-			
9. Feel Question	4.83	1.09	.264*	.311**	.191	-.081	.135	.652***	.557***	.692***	-		
10. Positive Mood	.05	.47	.323**	.177	-.070	.027	.195	.349**	.403***	.319**	.531***	-	
11. Negative Mood	-.02	.49	-.031	-.244*	-.067	-.160	-.299**	-.025	-.100	-.064	-.220	-.373**	-
12. PPI Experience	.88	1.32	.048	-.001	.036	-.198	-.077	-.072	-.163	.078	-.029	-.079	.017

*p < .05 **p < .01 ***p<.001

Table 37

Neutral Condition, Descriptive statistics and correlations among all variables: Study 3, N=91

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. SWL	.06	.31	-										
2. LT Control	4.21	.95	-.132	-									
3. LT Internal Locus	3.95	.80	-.017	.755***	-								

4. LT Flex	4.50	.88	-.053	.316**	.290**	-							
5. Dweck LT	4.23	1.13	-.071	.784***	.577***	.550***	-						
6. PPI Interest	6.22	2.61	-.038	.342***	.239*	.201	.225*	-					
7. PPI Perceived Meaning	6.61	2.25	.092	.328***	.277**	.307**	.261*	.843***	-				
8. PPI Effective	5.92	2.99	.084	.229*	.102	-.005	.089	.812***	.700***	-			
9. Feel Question	4.68	1.11	.172	.121	.088	-.003	.074	.467***	.424***	.556***	-		
10. Positive Mood	.15	.44	.543***	-.070	-.028	-.068	-.028	.038	.117	.117	.271**	-	
11. Negative Mood	-.09	.66	-.159	.131	.116	.296**	.164	.082	.035	.019	-.060	-.300**	-
12. PPI Experience	1.04	1.47	.045	-.106	-.168	-.199	-.161	-.047	-.166	.144	.117	-.026	-.087

*p < .05 **p < .01 ***p<.001

Table 38

Negative Condition, Descriptive statistics and correlations among all variables: Study 3, N=93

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. SWL	-.03	.40	-										
2. LT Control	4.19	.87	.081	-									
3. LT Internal Locus	3.98	.84	-.048	.772***	-								
4. LT Flex	4.34	.81	-.081	.402***	.239*	-							
5. Dweck LT	4.28	1.02	.117	.664***	.592***	.582***	-						
6. PPI Interest	6.04	2.37	.246*	.371***	.417***	.029	.238*	-					
7. PPI Perceived Meaning	6.08	2.34	.125	.432***	.448***	.136	.324**	.784***	-				
8. PPI Effective	5.75	2.99	.148	.248*	.363***	-.131	.093	.788***	.680***	-			
9. Feel Question	4.68	1.001	.228*	.054	.091	-.295**	-.061	.492***	.332***	.638***	-		
10. Positive Mood	.07	.57	.188	.097	-.033	.035	.102	.291**	.284**	.193	.343***	-	
11. Negative Mood	-.004	.47	-.051	-.021	.064	-.063	.043	-.065	.038	.116	-.068	-.260*	-
12. PPI Experience	1.11	1.51	-.239*	-.192	-.154	-.258*	-.335***	-.119	-.244*	.133	.133	-.007	-.040

*p < .05 **p < .01 ***p<.001

Study 4: All result tables with the PPI attitudes scale divided into subscales.

Table 39

All conditions, All means and correlations between main variables, N=177

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. LT Control	4.24	0.89	-								
2. PPI Interest	6.64	1.80	.28***	-							
3. PPI Meaning	6.38	2.00	.40***	.72***	-						
4. PPI Effective	7.10	2.35	.07	.62***	.39***	-					
5. Diff SWL	0.20	1.25	.06	.22**	.07	.01	-				
6. Diff Positive Mood	0.10	1.03	.03	.36***	.25***	.16*	.51***	-			
7. Diff Negative Mood	0.04	1.16	-.02	-.15*	-.14	-.04	.09	-.26***	-		
8. Feel Question	5.47	1.18	.09	.45***	.24**	.62***	.28***	.16*	.04	-	
9. Ease/Fluency	3.92	1.79	.35***	.25***	.42***	-.10	.04	.13	-.07	-.19*	-
10. PPI Experience	1.63	1.91	-.31***	-.17*	-.47***	.26***	-.17*	-.21**	.05	.15	.50***

*p < .05 **p < .01 ***p<.001

Table 40

Entity condition, All correlations between main variables, N=78

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. LT Control	4.12	0.85	-								
2. PPI Interest	6.94	1.50	.32**	-							
3. PPI Meaning	6.60	1.85	.35**	.58**	-						
4. PPI Effective	7.45	2.00	.12	.37**	.09	-					
5. Difference SWL	0.10	0.95	.06	.07	.01	.16	-				
6. Difference Positive Mood	0.14	0.98	-.04	.21	.23*	.04	.29**	-			
7. Difference Negative Mood	0.08	1.23	.06	-.12	-.11	.08	.19	-.31**	-		
8. Feel Question	5.59	1.09	.17	.25*	.05	.60***	.34**	-.06	-.02	-	
9. Ease/Fluency	3.92	1.86	.35**	.35**	.53***	-.16	.04	.21	.04	-.18	-
10. PPI Experience	1.56	1.88	-.13	-.25*	-.65***	.40***	.05	-.18	.09	.22	.49***

*p < .05 **p < .01 ***p<.001

Table 41

Incremental condition, All correlations between main variables, N=99

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. LT Control	4.34	0.92	-								
2. PPI Interest	6.40	1.98	.30**	-							
3. PPI Meaning	6.21	2.10	.46***	.79***	-						
4. PPI Effective	6.82	2.58	.07	.73***	.53***	-					
5. Difference SWL	0.28	1.44	.05	.29**	.11	-.03	-				
6. Difference Positive Mood	0.08	1.07	.09	.44***	.26*	.22*	.63***	-			
7. Difference Negative Mood	0.02	1.12	-.08	-19	-.17	-.13	.04	.22*	-		
8. Feel Question	5.37	1.25	.07	.54***	.33***	.63*	.27**	.28**	.08	-	
9. Ease/Fluency	3.92	1.75	.36***	.20*	.34***	-.07	.03	.07	-.18	-.20	-
10. PPI Experience	1.69	1.94	-.44***	-.13	-.35***	.20	-.28**	-.23*	.03	.11	.42***

*p < .05 **p < .01 ***p<.001

Appendix B

Study 1

Demographics

Gender:

☐ Male ☐ Female ☐ Other (please specify): _____

Age (in years): _____

From the following, please select the racial group with which you primarily identify.

☐ Caucasian, Non-Hispanic White, or Euro-American

☐ Black, or African American

☐ Latino or Hispanic

☐ East Asian, or Asian American

☐ South Asian, or Indian American

☐ Middle Eastern, or Arab American

☐ First Nations Métis, Inuit, Native American, or Alaskan Native

☐ Other (please specify): _____

Please Indicate your country of residence:

☐ US ☐ Canada ☐Other (please specify): _____

Satisfaction with Life Scale – Diener, Emmons, Larsen, & Griffin, 1985

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

1. In most ways my life is close to ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Lay Theories of Happiness Scale – Tullet & Plaks, 2016

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

Controllability Subscale:

1. *The truth is, people have very little control over their own happiness.
2. Though they might not know it, everyone has the power to make themselves happier.
3. *In reality, personal happiness is not something that you can control.

4. It is a person's responsibility to take their happiness into their own hands.

5. In all honesty, if someone is unhappy they can usually do something to change that.

6. Most people don't realize the extent to which happiness is within their own control.

7. *People who are sad can't be expected to make themselves happier.

8. *Unfortunately, people just can't control whether they are happy or not.

9. Most of the time, people who are sad feel that way because of choices they have made.

10. With enough effort, anyone can become a happier person.

11. When I see people who are really happy, I recognize that they probably worked hard for it.

Internal Locus of Control Subscale:

12. A person's happiness comes from within, not from their circumstances.

13. It's a person's perspective, not their situation, which determines their happiness.

14. It is always possible to be happy if you have a positive outlook.

15. The truth is, a person can be happy in any situation if they have the right frame of mind.

16. *In reality, happiness depends mostly on the environment a person lives in.

17. Having a positive outlook in any situation is key to being a happy person.

18. *In truth, happiness depends on the situation, not the person.

19. When you are a person who sees the bright side of things you can be happy in any situation.

20. *Life circumstances have a big impact on how happy we can be.

21. There are some people who stay happy no matter what life throws at them.

22. *Our surroundings have the biggest impact when it comes to our happiness.

Flexibility Subscale:

23. *A person's happiness level is something that doesn't change much.

24. *With small fluctuations, happiness is generally stable over time.

25. Happiness can change a lot through a person's life.

26. Even if someone is very unhappy now, they can still hope to be happy later on in life.

27. *In all honesty, it is very rare that a person's happiness changes a lot in the long term.

28. Happiness is something that changes a lot over a person's lifetime.

29. An unhappy person can become happy and vice versa.

30. *Although happiness can change in the short term, it stays pretty much the same in the long term.

31. Unfortunately, just because a person is happy at one point in their life doesn't mean that they will say that way.

32. *Some people are happy and some people are unhappy, but that doesn't really change much in the long term.

33. In reality, happiness can change a lot over time.

Note: * indicates the item is reverse coded.

Interventions

The following questionnaire will ask you about your opinions on a variety of tasks that have been purported to improve well-being. These tasks are discussed both in the psychological literature and in public contexts.

Please read through the descriptions and steps of each of the activities, as though you have

been presented with the task and instructions, and try to vividly imagine engaging in this task, and imagine your reaction to it, as well as how this would make you think and feel. Then, please indicate the extent to which you agree or disagree with each of the questions regarding the instructions.

There are no right or wrong answers. We are interested in your ideas.

You will not be asked to actually complete the activities or instructions, only to imagine completing them.

Note: After each of the interventions, participants complete the opinion questions in the next section.

Finding Silver Linings Intervention

Please read through the following description and steps of this activity, as though you have been presented with the task and instructions. Try to vividly imagine engaging in this task. Imagine your reaction to the task and how it would make you think and feel.

Think about the most recent time when something didn't go your way, or when you felt frustrated, irritated, or upset. In a few sentences, briefly describe the situation in writing. Then, list three things that can help you see the bright side of this situation.

For example, perhaps you missed your bus this morning. Three ways to look on the bright side of this situation might be:

- Even though you missed the bus, you got some good exercise when you were running to catch it.

- You're fortunate to live in a city where there was another bus just 10 minutes later, or where buses run reliably at all.
- Ten years from now, you likely won't remember what happened this morning.

Best Possible Self Intervention

Please read through the following description and steps of this activity, as though you have been presented with the task and instructions. Try to vividly imagine engaging in this task. Imagine your reaction to the task and how it would make you think and feel.

Take a moment to imagine your life in the future. What is the best possible life you can imagine? Consider all of the relevant areas of your life, such as your career, academic work, relationships, hobbies, and/or health. What would happen in each of these areas of your life in your best possible future?

For the next 15 minutes, write continuously about what you imagine this best possible future to be. Use the instructions below to help guide you through this process.

It may be easy for this exercise to lead you to examine how your current life may not match this best possible future. You may be tempted to think about ways in which accomplishing goals has been difficult for you in the past, or about financial/time/social barriers to being able to make these accomplishments happen. For the purpose of this exercise, however, we encourage you to focus on the future. Imagine a brighter future in which you are your best self and your circumstances change just enough to make this best possible life happen

This exercise is most useful when it is very specific- if you think about a new job, imagine exactly what you would do, who you would work with, and where it would be. The more specific you are, the more engaged you will be in the exercise and the more you'll get out of it.

Be as creative and imaginative as you want, and don't worry about grammar or spelling.

Random Acts of Kindness Intervention

Please read through the following description and steps of this activity, as though you have been presented with the task and instructions. Try to vividly imagine engaging in this task. Imagine your reaction to the task and how it would make you think and feel.

One day a week, perform five acts of kindness- all five in one day. It doesn't matter if the acts are big or small, but it is more effective if you perform a variety of acts.

The acts do not need to be for the same person- the person doesn't even have to be awake of them. Examples include feeding a stranger's parking meter, donating blood, helping a friend with a chore, or providing a meal to a person in need.

After each act, write down what you did in at least one or two sentences; you may also write down how it made you feel.

Savouring Walk Intervention

Please read through the following description and steps of this activity, as though you have been presented with the task and instructions. Try to vividly imagine engaging in this task. Imagine your reaction to the task and how it would make you think and feel.

Set aside 20 minutes to take a walk outside every day for a week. Walk by yourself, wear comfortable clothes, and don't use any electronics while walking.

Try to stick to this schedule unless the weather is extremely bad. You can still do this exercise in a light rain—provided you have a decent umbrella and rain jacket.

As you walk, try to notice as many positive things around you as you can. These can be sights, sounds, smells, or other sensations. For example, you could focus on the breathtaking height of a tree you never really noticed before, the intricate architecture of a building on your block, the dance of sunshine off a window or puddle, the smell of grass or flowers, or the way other people look out for each other as they navigate crowded streets.

As you notice each of these positive things, acknowledge each one in your mind—don't just let them slip past you. Pause for a moment as you hear or see each thing and make sure it registers with your conscious awareness, really take it in. Try to identify what it is about that thing that makes it pleasurable to you.

Try to walk a different route each day so you don't become too accustomed to any of these things and start to take them for granted.

Noticing Nature Intervention

Please read through the following description and steps of this activity, as though you have been presented with the task and instructions. Try to vividly imagine engaging in this task. Imagine your reaction to the task and how it would make you think and feel.

Be mindful of the natural elements and objects around you on a daily basis (e.g., trees, clouds, leaves, the moon, moving water, animals, etc.), and notice how these make you feel and

what emotions they evoke. Take a moment to allow yourself to truly experience the nature around you.

When you encounter a natural object, element, or scene that evokes a strong emotion in you, that moves you in some way, take a photo of it. If possible, upload the photo to your computer, or even to a blog if you have one. Along with the photo, jot down a brief description of what prompted you to take it and how this nature scene made you feel, in a few words or a few sentences.

You can take as many photos as you like, but try to take at least 10 photos over the course of two weeks. Be mindful of how the nature you encounter makes you feel on a daily basis, but space the photos out on different days.

Remember: What is key is your experience with what you are photographing—how nature makes you feel. Don't worry too much about the quality of the photos or how creative they are.

Three Good Things Intervention

Please read through the following description and steps of this activity, as though you have been presented with the task and instructions. Try to vividly imagine engaging in this task. Imagine your reaction to the task and how it would make you think and feel.

Each day, for at least one week, write down three things that went well for you that day, and provide an explanation for why you thought they went well. It is important to create a physical record of your items by writing them down; it is not enough simply to do this exercise in your head. The items can be relatively small in importance (e.g., "my co-worker make the

coffee today") or relatively large (e.g., "I earned a big promotion"). To make this exercise part of your daily routine, some find that writing before bed is helpful. As you write, follow these instructions:

- Give the event a title (e.g., "co-worker complimented my work on a project")
- Write down exactly what happened in as much detail as possible, including what you did or said and, if others were involved, what they did or said.
- Include how this event made you feel at the time and how this event made you feel later (including now, as you remember it).
- Explain what you think caused this event- why it came to pass.
- Use whatever writing style you please, and do not worry about perfect grammar and spelling. Use as much detail as you'd like.

Opinion Questions

Note: This scale is comprised of the interest subscale, the meaning subscale, the effective subscale, and the feel question.

Regarding the activity you just read, imagine your reaction to engaging in it and how it would make you think and feel. Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

Interest Subscale:

1. I would be interested in doing this activity once.

2. I would be interested in doing this activity regularly.

3. This activity seems interesting.

4. *This activity seems boring.

5. *This activity seems time consuming.

Meaning Subscale:

6. This activity seems meaningful.

7. *This activity seems shallow.

8. *This activity seems silly.

9. This activity seems profound.

10. *This activity seems pointless.

Effective Subscale:

11. This activity seems effective.

12. This activity seems powerful.

Note: * indicates the item is reverse coded.

Feel Question:

Relative to how you felt before doing this activity, how do you think you would feel after doing this activity?

1	2	3	4	5	6	7
Worse			No Different			Better

Survey Question

In this survey, you read instructions for how to engage in 6 activities. Have you ever done any of these activities before (or activities very similar to these), either online or in-person?

0	1	2	3	4	5
Never	Once	A few times	Several times	Many times	Frequently

Appendix C

Study 2

Demographics

Gender:

☐ Male ☐ Female ☐ Other (please specify): _____

Age (in years): _____

From the following, please select the racial group with which you primarily identify.

☐ Caucasian, Non-Hispanic White, or Euro-American

☐ Black, or African American

☐ Latino or Hispanic

☐ East Asian, or Asian American

☐ South Asian, or Indian American

☐ Middle Eastern, or Arab American

☐ First Nations Métis, Inuit, Native American, or Alaskan Native

☐ Other (please specify): _____

Please Indicate your country of residence:

☐ US ☐ Canada ☐Other (please specify): _____

Please indicate your current household income in US dollars.

☐ Rather not say

☐ Under $10,000

☐ $10,000-$19,999

☐ $20,000-$29,999

☐ $30,000-$39,999

☐ $40,000-$49,999

☐ $50,000-$74,999

☐ $75,000-$99,999

☐ $100,000-$150,000

☐ Over $150,000

Mood Scale (Baseline)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Please indicate to what extent you feel this way right now, at the present moment.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

1. Interested
2. Sad
3. Excited
4. Happy
5. Enthusiastic
6. Irritable
7. Contented
8. Impatient

Satisfaction with Life Scale – Diener, Emmons, Larsen, & Griffin, 1985

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

1. In most ways my life is close to ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Lay Theories of Happiness Scale – Tullet & Plaks, 2016

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

Controllability Subscale:

1. *The truth is, people have very little control over their own happiness.

2. Though they might not know it, everyone has the power to make themselves happier.

3. *In reality, personal happiness is not something that you can control.

4. It is a person's responsibility to take their happiness into their own hands.

5. In all honesty, if someone is unhappy they can usually do something to change that.

6. Most people don't realize the extent to which happiness is within their own control.

7. *People who are sad can't be expected to make themselves happier.

8. *Unfortunately, people just can't control whether they are happy or not.

9. Most of the time, people who are sad feel that way because of choices they have made.

10. With enough effort, anyone can become a happier person.

11. When I see people who are really happy, I recognize that they probably worked hard for it.

Internal Locus of Control Subscale:

12. A person's happiness comes from within, not from their circumstances.

13. It's a person's perspective, not their situation, which determines their happiness.

14. It is always possible to be happy if you have a positive outlook.

15. The truth is, a person can be happy in any situation if they have the right frame of mind.

16. *In reality, happiness depends mostly on the environment a person lives in.

17. Having a positive outlook in any situation is key to being a happy person.

18. *In truth, happiness depends on the situation, not the person.

19. When you are a person who sees the bright side of things you can be happy in any situation.

20. *Life circumstances have a big impact on how happy we can be.

21. There are some people who stay happy no matter what life throws at them.

22. *Our surroundings have the biggest impact when it comes to our happiness.

Flexibility Subscale:

23. *A person's happiness level is something that doesn't change much.

24. *With small fluctuations, happiness is generally stable over time.

25. Happiness can change a lot through a person's life.

26. Even if someone is very unhappy now, they can still hope to be happy later on in life.

27. *In all honesty, it is very rare that a person's happiness changes a lot in the long term.

28. Happiness is something that changes a lot over a person's lifetime.

29. An unhappy person can become happy and vice versa.

30. *Although happiness can change in the short term, it stays pretty much the same in the long term.

31. Unfortunately, just because a person is happy at one point in their life doesn't mean that they will say that way.

32. *Some people are happy and some people are unhappy, but that doesn't really change much in the long term.

33. In reality, happiness can change a lot over time.

Note: * indicates the item is reverse coded.

Interventions

This study has been designed to investigate responses to tasks used in the literature and in public, which have been purported to improve happiness. You will be asked to participate in one of these activities, and then answer some questions about it. There are no right or wrong answers. We are interested in your ideas.

Note: Each participant is randomly assigned to complete one of the three following interventions.

Finding Silver Linings Intervention

Please read through the descriptions and steps of the following activity completely, and follow them as instructed.

Think about the most recent time when something didn't go your way, or when you felt frustrated, irritated, or upset. In a few sentences, briefly describe the situation in writing. Then, list three things that can help you see the bright side of this situation.

For example, perhaps you missed your bus this morning. Three ways to look on the bright side of this situation might be:

- Even though you missed the bus, you got some good exercise when you were running to catch it.
- You're fortunate to live in a city where there was another bus just 10 minutes later, or where buses run reliably at all.
- Ten years from now, you likely won't remember what happened this morning.

First, what was something that didn't go your way? _____

Now, please list 3 things that help you see the bright side of the situation.

Item #1: _____

Item #2: _____

Item #3: _____

Best Possible Self Intervention

Please read through the descriptions and steps of the following activity completely, and follow them as instructed.

Take a moment to imagine your life in the future. What is the best possible life you can imagine? Consider all of the relevant areas of your life, such as your career, academic work, relationships, hobbies, and/or health. What would happen in each of these areas of your life in your best possible future?

For the next 15 minutes, write continuously about what you imagine this best possible future to be. Use the instructions below to help guide you through this process.

It may be easy for this exercise to lead you to examine how your current life may not match this best possible future. You may be tempted to think about ways in which accomplishing goals has been difficult for you in the past, or about financial/time/social barriers to being able to make these accomplishments happen. For the purpose of this exercise, however, we encourage you to focus on the future. Imagine a brighter future in which you are

your best self and your circumstances change just enough to make this best possible life happen

This exercise is most useful when it is very specific- if you think about a new job, imagine exactly what you would do, who you would work with, and where it would be. The more specific you are, the more engaged you will be in the exercise and the more you'll get out of it.

Be as creative and imaginative as you want, and don't worry about grammar or spelling.

What is the best possible life you can imagine? _____

What is the best possible life you can imagine in terms of your career (current or future)?_____

What is the best possible life you can imagine in terms of your relationships (romantic, or with family or friends)? _____

What is the best possible life you can imagine in terms of your health? _____

Three Good Things Intervention

Please read through the descriptions and steps of the following activity completely, and follow them as instructed.

Please think of three things that went well for you today, and provide an explanation for why you thought they went well. It is important to create a physical record of your items by writing them down; it is not enough simply to do this exercise in your head. The items can be relatively small in importance (e.g., "my co-worker make the coffee today") or relatively large (e.g., "I

earned a big promotion"). To make this exercise part of your daily routine, some find that writing before bed is helpful. As you write, follow these instructions:

- Give the event a title (e.g., "co-worker complimented my work on a project")
- Write down exactly what happened in as much detail as possible, including what you did or said and, if others were involved, what they did or said.
- Include how this event made you feel at the time and how this event made you feel later (including now, as you remember it).
- Explain what you think caused this event- why it came to pass.
- Use whatever writing style you please, and do not worry about perfect grammar and spelling. Use as much detail as you'd like.

Please list 3 things that went well for you today.

Item #1: _____

Item #2: _____

Item #3: _____

Opinion Questions- Feel

Note: This scale is comprised of the interest subscale, the meaning subscale, the effective subscale, and the feel question.

Feel Question:

Relative to how you felt before doing this activity, how do you feel now?

1	2	3	4	5	6	7
Worse			No Different			Better

Mood Scale (Post-Intervention)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Please indicate to what extent you feel this way right now, at the present moment.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

1. Interested
2. Sad
3. Excited
4. Happy
5. Enthusiastic
6. Irritable
7. Contented
8. Impatient

Opinion Questions- Interest, Meaning, and Effective subscales

Note: This scale is comprised of the interest subscale, the meaning subscale, the effective subscale, and the feel question.

Think of the activity you just completed and how it made you think and feel. Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

Interest Subscale:

1. I would be interested in doing this activity again.

2. I would be interested in doing this activity regularly.

3. This activity was interesting.

4. *This activity was boring.

5. *This activity was time consuming.

Meaning Subscale:

6. This activity was meaningful.

7. *This activity was shallow.

8. *This activity was silly.

9. This activity was profound.

10. *This activity was pointless.

Effective Subscale:

11. This activity was effective.

12. This activity was powerful.

Note: * indicates the item is reverse coded.

Survey Question

In this survey, you completed a well-being activity. Have you ever done this activity before (or activities very similar to these), either online or in-person?

0	1	2	3	4	5
Never	Once	A few times	Several times	Many times	Frequently

Appendix D

Study 3

Demographics

Gender:

☐ Male ☐ Female ☐ Other (please specify): _____

Age (in years): _____

From the following, please select the racial group with which you primarily identify.

☐ Caucasian, Non-Hispanic White, or Euro-American

☐ Black, or African American

☐ Latino or Hispanic

☐ East Asian, or Asian American

☐ South Asian, or Indian American

☐ Middle Eastern, or Arab American

☐ First Nations Métis, Inuit, Native American, or Alaskan Native

☐ Other (please specify): _____

Please Indicate your country of residence:

☐ US ☐ Canada ☐Other (please specify): _____

Please indicate your current household income in US dollars.

☐ Rather not say

☐ Under $10,000

☐ $10,000-$19,999

☐ $20,000-$29,999

☐ $30,000-$39,999

☐ $40,000-$49,999

☐ $50,000-$74,999

☐ $75,000-$99,999

☐ $100,000-$150,000

☐ Over $150,000

Mood Scale (Baseline)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Please indicate to what extent you feel this way right now, at the present moment.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

1. Interested
2. Sad
5. Enthusiastic
6. Irritable

3. Excited
4. Happy
7. Contented
8. Impatient

Satisfaction with Life Scale (Baseline) – Diener, Emmons, Larsen, & Griffin, 1985

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

1. In most ways my life is close to ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Lay Theories of Happiness Scale – Tullet & Plaks, 2016

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

Controllability Subscale:

1. *The truth is, people have very little control over their own happiness.

2. Though they might not know it, everyone has the power to make themselves happier.

3. *In reality, personal happiness is not something that you can control.

4. It is a person's responsibility to take their happiness into their own hands.

5. In all honesty, if someone is unhappy they can usually do something to change that.

6. Most people don't realize the extent to which happiness is within their own control.

7. *People who are sad can't be expected to make themselves happier.

8. *Unfortunately, people just can't control whether they are happy or not.

9. Most of the time, people who are sad feel that way because of choices they have made.

10. With enough effort, anyone can become a happier person.

11. When I see people who are really happy, I recognize that they probably worked hard for it.

Internal Locus of Control Subscale:

12. A person's happiness comes from within, not from their circumstances.

13. It's a person's perspective, not their situation, which determines their happiness.

14. It is always possible to be happy if you have a positive outlook.

15. The truth is, a person can be happy in any situation if they have the right frame of mind.

16. *In reality, happiness depends mostly on the environment a person lives in.

17. Having a positive outlook in any situation is key to being a happy person.

18. *In truth, happiness depends on the situation, not the person.

19. When you are a person who sees the bright side of things you can be happy in any situation.

20. *Life circumstances have a big impact on how happy we can be.

21. There are some people who stay happy no matter what life throws at them.

22. *Our surroundings have the biggest impact when it comes to our happiness.

Flexibility Subscale:

23. *A person's happiness level is something that doesn't change much.

24. *With small fluctuations, happiness is generally stable over time.

25. Happiness can change a lot through a person's life.

26. Even if someone is very unhappy now, they can still hope to be happy later on in life.

27. *In all honesty, it is very rare that a person's happiness changes a lot in the long term.

28. Happiness is something that changes a lot over a person's lifetime.

29. An unhappy person can become happy and vice versa.

30. *Although happiness can change in the short term, it stays pretty much the same in the long term.

31. Unfortunately, just because a person is happy at one point in their life doesn't mean that they will say that way.

32. *Some people are happy and some people are unhappy, but that doesn't really change much in the long term.

33. In reality, happiness can change a lot over time.

Note: * indicates the item is reverse coded.

Lay Theories of Happiness Scale- Dweck, 1999; Adapted by Howell, Passmore, & Holder, 2016

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

1. *I have a certain amount of happiness and I can't really do much to change it.
2. *My happiness is something that I can't change very much.
3. No matter who you are, you can change your happiness a lot.
4. *To be honest, I can't really change how happy I am.
5. I can always substantially change how happy I am.
6. *I can experience new things, but I can't really change my basic level of happiness.
7. No matter how much happiness I have, I can always change it quite a bit.
8. I can change even my basic level of happiness considerably.

Note: * indicates the item is reverse coded.

Intervention Instructions

Note: Each participant is randomly assigned to one of three instruction conditions.

Positive Instructions

This study investigates responses to tasks used in the literature and with the public. **Research has shown that engaging in these tasks improves positive mood and well-being.** Please

complete the following tasks and respond as honestly as possible. There are no right or wrong answers. We are interested in your ideas.

Please read through the descriptions and steps if the following activity completely, and follow them as instructed. Next, please indicate the extent to which you agree or disagree with each of the terms regarding the activity.

Neutral Instructions

This study investigates responses to tasks used in the literature and with the public. Please complete the following tasks and respond as honestly as possible. There are no right or wrong answers. We are interested in your ideas.

Please read through the descriptions and steps if the following activity completely, and follow them as instructed. Next, please indicate the extent to which you agree or disagree with each of the terms regarding the activity.

Negative Instructions

This study investigates responses to tasks used in the literature and with the public. **Engaging in these tasks has been purported to improve positive mood and well-being, but recent research has debunked these claims. Most evidence shows that these activities do not improve well-being.** Please complete the following tasks and respond as honestly as possible. There are no right or wrong answers. We are interested in your ideas.

Please read through the descriptions and steps if the following activity completely, and follow them as instructed. Next, please indicate the extent to which you agree or disagree with each of the terms regarding the activity.

Intervention

Three Good Things Intervention

Please read through the descriptions and steps of the following activity completely, and follow them as instructed.

Please think of three things that went well for you today, and provide an explanation for why you thought they went well. It is important to create a physical record of your items by writing them down; it is not enough simply to do this exercise in your head. The items can be relatively small in importance (e.g., "my co-worker make the coffee today") or relatively large (e.g., "I earned a big promotion"). To make this exercise part of your daily routine, some find that writing before bed is helpful. As you write, follow these instructions:

- Give the event a title (e.g., "co-worker complimented my work on a project")
- Write down exactly what happened in as much detail as possible, including what you did or said and, if others were involved, what they did or said.
- Include how this event made you feel at the time and how this event made you feel later (including now, as you remember it).
- Explain what you think caused this event- why it came to pass.
- Use whatever writing style you please, and do not worry about perfect grammar and spelling. Use as much detail as you'd like.

Please list 3 things that went well for you today.

Item #1: _____

Item #2: _____

Item #3: _____

Mood Scale (Post-Intervention)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Please indicate to what extent you feel this way right now, at the present moment.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

1. Interested
2. Sad
3. Excited
4. Happy
5. Enthusiastic
6. Irritable
7. Contented
8. Impatient

Satisfaction with Life Scale (Post-Intervention) – Diener, Emmons, Larsen, & Griffin, 1985

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

1. In most ways my life is close to ideal.

2. The conditions of my life are excellent.

3. I am satisfied with my life.

4. So far I have gotten the important things I want in life.

5. If I could live my life over, I would change almost nothing.

Opinion Questions

Note: This scale is comprised of the interest subscale, the meaning subscale, the effective subscale, and the feel question.

Feel Question:

Relative to how you felt before doing this activity, how do you feel now?

1	2	3	4	5	6	7
Worse			No Different			Better

Think of the activity you just completed and how it made you think and feel. Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

Interest Subscale:

1. I would be interested in doing this activity again.

2. I would be interested in doing this activity regularly.

3. This activity was interesting.

4. *This activity was boring.

5. *This activity was time consuming.

Meaning Subscale:

6. This activity was meaningful.

7. *This activity was shallow.

8. *This activity was silly.

9. This activity was profound.

10. *This activity was pointless.

Effective Subscale:

11. This activity was effective.

12. This activity was powerful.

Note: * indicates the item is reverse coded.

Manipulation Check

In the instruction for the activity you completed, was any of the following information provided? Please check ALL that apply.

☐ Research has shown that engaging in these tasks improves positive mood and well-being.

☐ This activity was invented by Oprah Winfrey.

☐ There are no right or wrong answers.

☐ Research has shown that these activities do not improve well-being.

☐ Research has shown that these activities are most beneficial for elderly people.

Survey Question

In this survey, you completed a well-being activity. Have you ever done this activity before (or activities very similar to these), either online or in-person?

0	1	2	3	4	5
Never	Once	A few times	Several times	Many times	Frequently

Appendix E

Study 4

Demographics

Gender:

☐ Male ☐ Female ☐ Other (please specify): _____

Age (in years): _____

From the following, please select the racial group with which you primarily identify.

☐ Caucasian, Non-Hispanic White, or Euro-American

☐ Black, or African American

☐ Latino or Hispanic

☐ East Asian, or Asian American

☐ South Asian, or Indian American

☐ Middle Eastern, or Arab American

☐ First Nations Métis, Inuit, Native American, or Alaskan Native

☐ Other (please specify): _____

Please Indicate your country of residence:

☐ US ☐ Canada ☐Other (please specify): _____

Please indicate your current household income in US dollars.

☐ Rather not say

☐ Under $10,000

☐ $10,000-$19,999

☐ $20,000-$29,999

☐ $30,000-$39,999

☐ $40,000-$49,999

☐ $50,000-$74,999

☐ $75,000-$99,999

☐ $100,000-$150,000

☐ Over $150,000

Mood Scale (Baseline)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Please indicate to what extent you feel this way right now, at the present moment.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

1. Interested
2. Sad
3. Excited
4. Happy
5. Enthusiastic
6. Irritable
7. Contented
8. Impatient

OECD Satisfaction with Life Item (Baseline)

All things considered, how satisfied are you with your life as a whole nowadays?

0	1	2	3	4	5	6	7	8	9	10
Extremely Dissatisfied										Extremely Satisfied

Lay Theories of Happiness Scale – Tullet & Plaks, 2016

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6

Strongly Disagree Strongly Agree

Controllability Subscale:

1. Though they might not know it, everyone has the power to make themselves happier.

2. In reality, personal happiness is not something that you can control.

Self-Construal Filler Items – Gundykunst & Lee, 2003

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

1. I should be judged on my own merit.

2. I consult others before making important decisions.

3. My relationships are more important to me than my accomplishments.

4. I prefer to be self-reliant rather than depend on others.

Conditions- Howell, Passmore, & Holder, 2016 (Adapted)

Note: Participants will be randomly assigned to one of two conditions where they will read one of the two following fictional articles.

'Happiness is not controllable' Entity Condition:

Happiness is in your genes: How much of happiness is biology?

Are we destined to experience a predetermined level of happiness, or are we the masters of our own feelings? According to the researchers at the University of Illinois, we have very little control over how happy we are in life.

Although levels of happiness may move around in response to life events or personal effort, recent research suggests that happiness is largely due to genetics and stable personality traits. It appears that some people are simply born with a greater propensity for happiness and are likely to stay that way throughout life. In a ground-breaking study to be published in the Journal of Psychological Science, Dr. Lawrence Brown, an international expert in the field of life satisfaction and happiness, has already begun to dramatically alter the field's understanding of the genetic sources of happiness. Using the gold standard research approach for studying hereditary traits, he studies identical twins who were raised apart to tease apart the effects of nature and nurture. Brown and his team of researchers found that even twins raised in vastly different environments- from positive and nourishing to extremely negative and stressful- scored remarkably similarly to one another on measures of life satisfaction and happiness.

Dr. Brown and his colleagues concluded that "50-80% of a person's overall happiness is due to their genetic makeup." In other words, they found that a person's happiness is largely out of their control- people have an internal baseline or "set-point" for happiness. Although major life events and personal choices do have some influence, they rarely lead to lasting changes, happiness returns to baseline.

Other researchers have also drawn similar conclusions. Research by Dr. Richard Davis suggests that happiness is largely shaped by the individual's personality characteristics. For example, individuals who are more outgoing tend be happier in life than those who are less outgoing. Dr. Davis's research suggests that "personality characteristics shape how individuals respond to and interact with their environments, which in turns influences their happiness." This has lead him to conclude that "because personality is stable across the life span it is difficult to move around happiness."

What does this mean for someone looking to improve their happiness? Unfortunately, the evidence suggests that the overall happiness you're going to experience is primarily out of your control.

'Happiness is controllable' Incremental Condition:

Happiness is in your hands: How much control do you have over your happiness?

Are we destined to experience a predetermined level of happiness, or are we the masters of our own feelings? According to the researchers at the University of Illinois, we have a lot of control over how happy we are in life.

Although happiness may be influenced by stable factors such as genes and/or personality traits, recent research suggests that happiness is largely due to our choices and behaviours. It appears that some people are not just born with a greater propensity for happiness, and are unlikely to stay at the same level of happiness throughout life. In a ground-breaking study to be published

in the Journal of Psychological Science, Dr. Lawrence Brown, an international expert in the field of life satisfaction and happiness, has already begun to dramatically alter the field's understanding of the controllable sources of happiness. Using the gold standard research approach for studying hereditary traits, he studies identical twins who were raised apart to tease apart the effects of nature and nurture. Brown and his team of researchers found that even twins raised in very similar environments- from positive and nourishing to extremely negative and stressful- scored remarkably differently from one another on measures of life satisfaction and happiness.

Dr. Brown and his colleagues concluded that "50-80% of a person's overall happiness is due to their own choices and their chosen perspective on life." In other words, they found that a person's happiness is largely within their control- people may begin with an internal baseline or "set-point" for happiness, but this baseline soon changes as they develop as a person. Although our genetics do have some influence, they do not determine how we are as fully grown adults.

Other researchers have also drawn similar conclusions. Research by Dr. Richard Davis suggests that happiness is largely shaped by the behaviours that individuals choose to engage in. For example, individuals who choose to engage in activities that foster positive emotion tend be happier in life than those who choose not to engage in these activities. Dr. Davis's research suggests that "individual's choices shape how they respond to and interact with their environments, which in turns influences their happiness." This has led him to conclude that "because we can actively seek out opportunities for positive emotions it is possible to move around happiness."

What does this mean for someone looking to improve their happiness? Fortunately, the evidence suggests that the overall happiness you're going to experience is primarily within your control.

Intervention

This study has been designed to investigate responses to tasks used in the literature and with the public, which have been purported to improve well-being. You will be asked to participate in one of these activities, and then answer some questions about your experience. There are no right or wrong answers. We are interested in your ideas.

Three Good Things Intervention

Please read through the descriptions and steps of the following activity completely, and follow them as instructed.

Please think of three things that went well for you today, and provide an explanation for why you thought they went well. It is important to create a physical record of your items by writing them down; it is not enough simply to do this exercise in your head. The items can be relatively small in importance (e.g., "my co-worker make the coffee today") or relatively large (e.g., "I earned a big promotion"). To make this exercise part of your daily routine, some find that writing before bed is helpful. As you write, follow these instructions:

- Give the event a title (e.g., "co-worker complimented my work on a project")
- Write down exactly what happened in as much detail as possible, including what you did or said and, if others were involved, what they did or said.

- Include how this event made you feel at the time and how this event made you feel later (including now, as you remember it).
- Explain what you think caused this event- why it came to pass.
- Use whatever writing style you please, and do not worry about perfect grammar and spelling. Use as much detail as you'd like.

Please list 3 things that went well for you today.

Item #1: _____

Item #2: _____

Item #3: _____

Mood Scale (Post-Intervention)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Please indicate to what extent you feel this way right now, at the present moment.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

1. Interested
2. Sad
3. Excited
4. Happy
5. Enthusiastic
6. Irritable
7. Contented
8. Impatient

OECD Satisfaction with Life Item (Baseline)

All things considered, how satisfied are you with your life as a whole nowadays?

0	1	2	3	4	5	6	7	8	9	10
Extremely Dissatisfied										Extremely Satisfied

Opinion Questions

Note: This scale is comprised of the interest subscale, the meaning subscale, the effective subscale, and the feel question.

Feel Question:

Relative to how you felt before doing this activity, how do you feel now?

1	2	3	4	5	6	7
Worse			No Different			Better

Think of the activity you just completed and how it made you think and feel. Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree									Strongly Agree

Interest Subscale:

1. I would be interested in doing this activity again.

2. I would be interested in doing this activity regularly.

3. This activity was interesting.

4. *This activity was boring.

5. *This activity was time consuming.

Meaning Subscale:

6. This activity was meaningful.

7. *This activity was shallow.

8. *This activity was silly.

9. This activity was profound.

10. *This activity was pointless.

Effective Subscale:

11. This activity was effective.

12. This activity was powerful.

Note: * indicates the item is reverse coded.

<u>Manipulation Check - Lay Theories of Happiness Scale – Tullet & Plaks, 2016</u>

Please read over each of the following statements and rate the extent to which you agree or disagree with each one. Please select the appropriate response for each question below.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

Controllability Subscale:

1. *The truth is, people have very little control over their own happiness.

2. Though they might not know it, everyone has the power to make themselves happier.

3. *In reality, personal happiness is not something that you can control.

4. It is a person's responsibility to take their happiness into their own hands.

5. In all honesty, if someone is unhappy they can usually do something to change that.

6. Most people don't realize the extent to which happiness is within their own control.

7. *People who are sad can't be expected to make themselves happier.

8. *Unfortunately, people just can't control whether they are happy or not.

9. Most of the time, people who are sad feel that way because of choices they have made.

10. With enough effort, anyone can become a happier person.

11. When I see people who are really happy, I recognize that they probably worked hard for it.

Note: * indicates the item is reverse coded.

<u>Survey Questions</u>

Ease/Fluency Question:

A few minutes ago you completed a reflection activity about things that went well for you today. How easy or difficult was that task for you to complete?

1	2	3	4	5	6	7
Very easy						Very difficult

Article Manipulation Check

You were asked to read an article from BBC News about research into where happiness comes from. Do you remember what the article was about? [Please select the MOST CORRECT statement].

- MOST of our happiness comes from GENETICS AND STABLE PERSONALITY TRAITS, so most of our happiness is out of our control.
- MOST of our happiness comes from our CHOICES AND BEHAVIOUR, so most of our happiness is in our control.
- MOST of our happiness comes from MATERIAL POSSESSIONS AND MONEY, so having those things is the key to our happiness.

Suspicion Probe Questions

Do you have any additional thoughts about the article that you read? In our research it is helpful to know if respondents had any thoughts or ideas about what the research was about, other than what was explained in the study. _____

How well-written was the article?

1	2	3	4	5
Not at all				Extremely

How convincing was the information in the article?

1	2	3	4	5

Not at all					Extremely

Past Experiences with PPIs Question

In this survey, you completed a well-being activity. Have you ever done this activity before (or activities very similar to these), either online or in-person?

0	1	2	3	4	5
Never	Once	A few times	Several times	Many times	Frequently

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