Do Online Positive Psychology Interventions Work Equally Well in Distressed and Non-Distressed Users?

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Abstract

Past research suggests distress level may differentiate users of online positive psychology interventions (OPPIs). Non-distressed users are moderately happy and use OPPIs as a self-improvement tool to maximize their sense of well-being. Distressed users experience high levels of negative affect and use OPPIs to relieve their suffering and unhappiness. The present study was designed to explore whether distressed and non-distressed individuals experience different outcomes after practising an OPPI. Demographic and psychological well-being information was collected from two large international samples (combined $N = 6856$) for up to 6 months following completion of a variety of brief positive psychology interventions (e.g. cultivating gratitude, self-compassion, optimism). Using cluster analysis to subgroup OPPI users, Study 1 found a two cluster solution for classifying OPPI users based on distress level, replicating the findings first observed by Parks, Della Porta, Pierce, Zilca, and Lyubomirsky (2012). Study 2 explored differences in well-being outcomes between these two clusters. The distressed cluster reported greater decreases in depressive symptoms and increases in life satisfaction over time than the non-distressed cluster. Previous experience with psychotherapy was associated with greater long-term improvements in life satisfaction for the distressed cluster, although attrition rates were higher for the distressed cluster in one sample. Based on these findings, distress level appears to distinguish both who uses OPPIs and who stands to benefit most. Distressed individuals experienced the greatest gains, although they were also more likely to have difficulty with regular participation. The high attrition rate and limited scope of outcome measures of well-being were discussed as limitations. Future research was encouraged to clarify the different mechanisms in effect for distressed and non-distressed OPPI users and to develop interventions more resistant to attrition.

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I hope this dissertation is as rewarding to read as it was to write!

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1 Introduction

There has been an explosion of interest in both research and public domains related to positive psychology. Based on a solid and continually-evolving body of empirical research, we are learning how positive[1] aspects of human experience such as optimism, gratitude, and social connectedness can be important in defining health and well-being. Martin Seligman, the principal founder of positive psychology wrote: 'I predict that Positive Psychology in this new century will come to understand and build those factors that allow individuals, communities, and societies to flourish.' (Seligman, 2002). Most relevant to clinical psychology, the culmination of evidence to date indicates there is significant value in conceptualizing mental illness as a function of a deprivation of positive experiences and skills and not only as a function of the presence of symptoms and dysfunction (Layous, Chancellor, Lyubomirsky, Wang, & Doraiswamy, 2011).

One interesting line of inquiry that follows from this perspective is whether psychological interventions can be developed to cultivate positive traits and experiences that would, in turn, improve mental health. A recent meta-analysis of 51 positive psychology interventions (PPIs) involving a total of 4,266 participants indicated that PPIs improved well-being in 96% of cases (with an average *r* effect size of .29) and improved

[1] Critics argue it is too simplistic to label human experiences as wholly "positive", when there is evidence that they can have detrimental effects under certain conditions (e.g. joy can be defensive and represent an attempt to avoid dealing with adversity) (Lazarus, 2003; McNulty & Fincham, 2012). The use of the term "positive" in this paper is based on convention and reflects the tenets of positive psychology, rather than the value of a particular experience.

depression in 80% of cases (with an average *r* effect size of .31) (Sin & Lyubomirsky, 2009). This is clear evidence that PPIs have great potential for improving lives.

A number of researchers have adapted PPIs for use in a self-administered Internet-based format. These online PPIs (OPPIs) are notable for the lack of direct personal contact between researchers and participants. Recruitment, communication of study directives and informed consent, assessment, and intervention procedures are all conveyed through Internet websites and email. As a result, any individual worldwide can use an OPPI, provided they have an Internet connection and computer access.

Mitchell, Vella-Brodrick, and Klein (2010) outlined several advantages associated with the OPPI format relative to the traditional in-person method of delivery. First, OPPIs are highly accessible, particularly for individuals who have very busy schedules, mobility difficulties, or apprehension about seeking help. According to the 2006 Canadian Community Health Survey, only 38.5% of individuals with a self-reported mental disorder sought out mental health resources (Lesage, Vasiliadis, Gagné, Dudgeon, Kasman, & Hay, 2006). The high number of individuals that do not seek mental health resources might potentially prefer to benefit from accessing some psychological support provided by easy-to-access OPPIs. Second, OPPIs are sustainable cost-effective methods of delivery. The financial costs to both treatment providers as well as consumers of these interventions are estimated to be one-third to one-sixth of the cost associated with in-person interactions (Mitchell et al., 2010). Third, OPPIs can be tailored to provide personalized content based on pre-determined markers such as scores on personality tests, user preferences, or other variables that are known to moderate the effectiveness of an

intervention. Fourth, OPPIs can take advantage of a multimedia approach by incorporating audio, video, animation, pictures, and graphic elements. Using multiple formats allows OPPIs to appeal to different learning styles, as well as provide an exciting and engaging experience. Fifth, OPPIs provide users with a sense of privacy and active engagement in the process of improving their well-being. Without the physical presence of a treatment provider, users experience a greater sense of control over the direction of their learning and change process. Finally, OPPIs are particularly amenable to scientific research, as they provide a reliable, uniform, and controlled delivery of information to participants (Mitchell et al., 2010).

Given the above noted benefits, several researchers are testing the efficacy of OPPIs for improving psychological well-being. A literature review conducted by this author uncovered fifteen OPPI studies that have been presented in peer-reviewed journals (Table 1). The most common procedure utilized across these studies was to follow guidelines for a randomized controlled trial. First, baseline self-report data is collected including demographic information and entry levels on the outcome measures of interest related to well-being. Operationalizations of well-being differ greatly across studies, but usually include a combination of measures such as positive mood, happiness, and life satisfaction and measures of undesirable psychological states such as negative mood and depressive symptoms. For example, Seligman et al. (2005) used depressed mood and self-reported happiness as outcome measures.

Following completion of baseline measures, participants are randomly assigned to an intervention or control group and provided with instructions on how to practice their

assigned exercise for a pre-determined treatment period. Treatment periods in the studies in Table 1 ranged from 3 days to 6 weeks. For PPIs in general, longer intervention duration is associated with greater improvements in well-being (Sin & Lyubomirsky, 2009) presumably due to having more time to process and integrate the activities into one's life; however, it is unclear whether the same effect occurs when online interventions are considered exclusively. A recent review of five OPPIs observed greater effectiveness for interventions practised for 3 weeks or less (Mitchell, Vella-Brodrick, & Klein, 2010).

Following the treatment period, participants complete the outcome measures again. Additional follow-up assessment sessions are also often included to observe the long-term effects of OPPIs. Follow-up assessments most often occur several months after the intervention period. In some cases, financial incentives are offered to participants to increase the likelihood that they complete these additional questionnaires. For example, participants in the study by Seligman et al. (2005) were entered into a $100 lottery for each follow-up they completed. In most cases, participation reminders are sent by email at regular intervals to encourage the completion of follow-up assessments (e.g.Schueller & Parks, 2012).

Effectiveness of OPPIs is indicated when participants report both greater increases in desirable psychological states as well as greater decreases in undesirable psychological states than participants in the control group. According to Table 1, a wide variety of OPPIs have been studied in both community and student populations, and most studies report evidence of significant improvement in several facets of psychological

well-being. These findings represent growing support for the notion that PPIs can be beneficial to psychological well-being when presented in an online format.

1.1 Qualities of OPPI users: Non-distressed versus distressed

The conclusions drawn about OPPI effectiveness must be informed by an exploration of the qualities that characterize OPPI participant samples. Recent research suggests there is significant heterogeneity within the overall population of OPPI consumers that has yet to be adequately addressed by existing OPPI studies. Parks, Della Porta, Pierce, Zilca, and Lyubomirsky (2012) performed a cluster analysis on a large sample of adults ($N = 912$) who signed up to participate in an OPPI study after viewing a positive psychology website (authentichappiness.org) or while searching the Internet for positive psychology studies. The majority of participants were well-educated Caucasian females living in the United States. The researchers used baseline demographic and self-reported well-being measures to investigate various ways of clustering OPPI users. The model that provided the optimal fit included four mood variables: depressive symptoms, life satisfaction, affect balance, and general happiness. Two clusters were identified based on this model. The first group, called the 'non-distressed cluster', included individuals who reported average levels of depressive symptoms and life satisfaction, significantly more positive affect than negative affect, and moderate levels of happiness. These individuals were described as being not exceptionally happy (and therefore motivated to improve) but not experiencing significant distress. The second group was referred to as the 'distressed cluster' and included participants reporting high levels of depressive symptoms, below average life satisfaction, and low levels of happiness. Individuals in the

distressed cluster were also more likely to report being currently depressed. Many OPPI studies, including Parks et al. (2012), use the Centre for Epidemiological Studies – Depression scale (CESD; Radloff, 1977) as an operational definition of distress (e.g. Parks et al., 2012; Schueller & Parks, 2012; Seligman, Steen, Park, & Peterson, 2005; Sergeant & Mongrain, 2011; Shapira & Mongrain, 2010). Scores above 16 represent significant depressive symptoms (Radloff, 1977).

Parks et al. (2012) identified the distressed and non-distressed subsamples of people who are more likely to volunteer for OPPI studies; however they did not differentiate the effectiveness of OPPIs for these two subgroups. It remains unclear whether non-distressed relative to distressed individuals respond to OPPIs in the same manner and whether the findings of efficacy in OPPI studies to date are equally applicable to these two subsamples. It is important to clarify whether the distressed subgroup is responding as well to OPPIs given that individuals experiencing depressive symptoms may find the task of practising PPIs more challenging when accessed through an online environment (Sergeant & Mongrain, 2011; Sin, Della Porta, & Lyubomirsky, 2011).

Previous studies suggest that distressed and non-distressed OPPI consumers may differ in terms of their psychological well-being outcomes in OPPI studies. Sin and Lyubomirsky's meta-analysis (2009) reported depressed individuals benefited more from PPIs than their non-depressed counterparts. This effect may have been confounded, however, by variations in treatment format; the review included studies of individual therapy and group-administered PPIs as well as self-administered PPIs, and the depressed

samples were more likely to be engaged in individual therapy and group-administered formats than the self-administered format. The authors also reported larger effect sizes for PPIs using an individual therapy or group therapy format than the self-administered format. Elsewhere, it has been suggested that the greater amount of attention and guidance from a clinician in individual or group therapy may be contributing to this differential effect (Sin et al., 2011). Thus, the greater improvements observed for more depressed samples may not have been present if only self-administered PPIs were considered.

When exclusively considering studies using the self-administered Internet format (see Table 1), conflicting evidence emerges about whether distressed individuals may be responding differently to PPIs than their non-distressed counterparts. At present, no study has distinguished between outcomes for distressed and non-distressed participants within the same sample. Information can only be gleaned from the overall leaning of an entire sample either towards distressed traits or non-distressed traits. A study by Sin et al. (2011) reported *diminished* well-being in individuals with mild to moderate depressive symptoms after engaging in a PPI designed to enhance feelings of gratitude. The researchers speculated that these distressed participants may have had difficulty finding things they were grateful for given their more chronic experience of depressive thoughts and emotions. As a result, they may have felt like they had failed to successfully complete the exercise and experienced reduced well-being in response.

Additionally, a moderation analysis conducted by Sergeant and Mongrain (2011) found individuals with a needy personality style (a vulnerability factor for Major

Depressive Disorder characterized by an entrenched dependence on other people for comfort, reassurance, and self-worth) reported *lowered* self-esteem across both a gratitude-inducing OPPI and a mood-enhancing OPPI. The researchers posited that these individuals may have had difficulty engaging in positive psychology exercises without interpersonal contact. As a result, their psychological well-being suffered.

Conversely, five studies including participants identified as distressed based on mean CES-D scores greater than 16 reported significant improvement in psychological well-being following an OPPI similar to the improvements reported in nine studies where participants were non-distressed or level of depression was not reported (Mongrain & Anselmo-Matthews, 2012; Mongrain, Chin, & Shapira, 2011; Seligman et al., 2005; Sergeant & Mongrain, 2011; Shapira & Mongrain, 2010). The general theory emerging from these findings is that individuals who are vulnerable to distress and clinical disorder may be particularly likely to benefit from OPPI use. One possible mechanism by which this greater benefit might occur is a deficit compensation effect. Individuals in a state of distress are unlikely be engaged in activities that promote positive cognitive, affective, and behavioural experiences. OPPIs are theorized to improve well being by producing such experiences (Lyubomirsky & Layous, 2013) and therefore might fill a gap in the range of experiences in distressed individuals. Additionally, OPPIs encourage individuals to engage in an increased number of enjoyable activities in their daily lives. As in behavioural activation techniques for treating depression, such activities may contribute to improvements in well-being by providing distressed individuals with a new sense of engagement and meaning in their daily activities (Seligman, Rashid, & Parks, 2006).

Many OPPI studies have acknowledged that not all individuals respond in the same manner to the same intervention. For example, Lyubomirsky, Dickerhoof, Boehm, and Sheldon (2011) noted OPPIs tend to be more effective when users are invested in the idea that positive psychology techniques are an effective way of improving well-being (i.e. the 'proper will'). This finding is akin to the expectancy effects observed in psychotherapy research, where clients who believe more strongly in the effectiveness of therapy tend to experience better therapeutic outcomes (Greenberg, Constantino, & Bruce, 2006). Several other factors have been identified which can significantly moderate the effects of OPPIs on psychological well-being, but it is unknown whether such factors apply equally across the two subsamples of OPPI consumers. Exploring whether different factors predict the success of OPPIs for distressed and non-distressed happiness-seekers would also provide important information about how to best tailor future interventions to these two subgroups.

1.2 Evidence for differential outcomes between groups of OPPI users

One factor demonstrated to affect psychological well-being outcomes is person-activity fit. Lyubomirsky, Sheldon, and Schkade (2005) hypothesized OPPIs are most effective when they work synergistically with an individual's strengths, interests, values, or inclinations. When considered concurrently with the previously discussed theory that OPPIs are most beneficial when they address a personal deficit, a distinction must be made between effectiveness due to structural and process features of OPPIs. As a structural feature, person-activity fit enhances the familiarity of OPPI exercises, making them easier for participants to use and succeed at. As a process feature, deficit

compensation increases the chance that the OPPI will produce an experience of personal growth or development rather than merely maintaining an existing state. Put plainly, OPPIs are theorized to be most helpful when they improve upon an area of weakness in a manner that capitalizes on existing skills.

Schueller (2010) reported participants in a study involving six OPPIs exhibited preferences for particular exercises based on their temporal orientation. One group of participants preferred exercises which focused on intensifying and elongating *present* experiences of interpersonal interactions or pleasure (active-constructive responding and savoring exercises). Another group of participants preferred exercises which focused on reflecting on *past* experiences over the course of their life or the previous day (life summary and blessings). A third group of participants preferred exercises which focused on *future* planning for using one's strengths in a new way or setting up a meeting to thank another person (strengths and gratitude visit). Schueller (2010) also observed greater improvements in well-being when participants were engaging in exercises that matched their time-based preference. These findings suggest that OPPIs which take advantage of an individual's natural tendency to focus on the past, present, or future may produce greater improvements to well-being. According to Zimbardo's time perspective theory, distressed individuals (identified by low self-esteem and high depression, anxiety, and unhappiness) tend to have a cognitive temporal bias towards the negative past (Zimbardo & Boyd, 1999). Thus, they likely have a preference towards focusing on the past that is not seen in non-distressed individuals. While yet to be studied directly, it is possible

OPPIs focusing on past experiences in particular may be a better fit for distressed individuals compared to non-distressed individuals.

Another factor that could potentially influence psychological well-being outcomes differently for distressed versus non-distressed OPPI consumers is history of psychological treatment. Existing OPPI studies have not considered whether past experience with psychotherapy influences overall efficacy, although it is possible having such prior experience may have cultivated some insight and psychological mindedness which may be instrumental in enhancing the well-being of OPPI users. In a study where participants were asked to engage in activities designed to satisfy one of three general goals (greater autonomy, competence, or relatedness), Sheldon et al. (2010) noted participants who reported little or no progress in meeting their goals through the OPPI exercises also reported reduced subjective well-being over time. Successfully completing OPPI exercises involves some degree of psychological mindedness, and this skill is often developed over the course of psychotherapy. Thus, individuals who have received psychological treatment in the past may find OPPI exercises easier to complete, may be more motivated and experience greater improvement in psychological well-being as a result. Those unfamiliar with the process of introspective work may struggle to complete psychological exercises on their own and may abandon the protocol.

1.3 Attrition among OPPI users

Conclusions about the effectiveness of OPPIs must also be tempered by the finding of high levels of attrition in most of the studies to date. In eight of the fifteen studies reviewed in Table 1, at least half of the participants dropped out of the study

before the final assessment point. The reasons for drop-out have not been well explained, and there are likely many factors influencing participant behaviour in this respect. Some individuals may have difficulty finding time to engage in these practices and report back on their experiences. Others may lack motivation or engagement with the activities. Attrition may also be an indicator of treatment ineffectiveness; individuals who do not experience the anticipated benefits to well-being may become frustrated and give up. Alternatively, they may experience early gains that lead them to conclude they no longer need to engage in the activities (Cavanagh, 2010). Whatever the reason, missing data caused by attrition limits the generalizability and validity of the conclusions that are drawn from these studies.

Geraghty, Wood, and Hyland (2010) identified several moderators of attrition in a 2-week OPPI study; participants with lower internal locus of control and lower expectancy for improvement were more likely to drop out of the study; however, exercise difficulty, age, gender[2], and baseline symptom severity did not predict attrition. The non-completers in Shapira and Mongrain (2010) were younger and reported higher baseline depression. Sergeant and Mongrain (2011) also found drop-outs were younger, practised their activity fewer times, and had a greater likelihood of being male. It is also possible that the pattern of attrition may differ for distressed and non-distressed participants within these samples. Distressed individuals may volunteer readily for OPPI studies but may also be more likely to drop out early than the non-distressed subgroup due to difficulty completing the exercises or feeling overwhelmed by their symptoms. No study to date

[2] The findings for gender in this study must be interpreted with caution because females comprised 96% of the sample.

has explored whether distress level influences attrition above and beyond the known predictors of attrition described above. Comparison of attrition rates in distressed OPPI consumers and non-distressed OPPI consumers would provide further information about the relative efficacy of OPPIs for these two subgroups.

1.4 Current Study

The preceding literature review highlights the need to directly investigate the response to and attrition from OPPIs amongst distressed and non-distressed consumers. Additionally, findings to date suggest moderators may be influencing the effectiveness of OPPIs for these two subgroups (e.g. temporal orientation of exercises, history of psychological treatment). The focus of this dissertation was to investigate these two issues to identify conditions under which distressed individuals are more likely to benefit from using an OPPI. Data was collected in two OPPI trials called Project HOPE 1 (PH1; Mongrain, 2007) and Project HOPE 2 (PH2; Mongrain, 2010). These trials utilized 16 different positive psychology exercises in total (see Table 2). The methodology and sample characteristics of PH1 and PH2 are described in the Method section.

Study 1 consisted of a replication of the cluster analysis conducted by Parks et al. (2012) to provide evidence for the validity of the distinction between non-distressed and distressed OPPI consumers. The first hypothesis was that the best-fitting model would replicate Parks et al. (2012) findings and identify two significant clusters, one showing indications of low mood and psychological well-being and another showing indications of average mood and psychological well-being. The PH1 sample was used to test this hypothesis due to its use of the same outcome measures used by Parks et al. (2012). A

successful replication of the findings from Parks et al. (2012) would provide additional convergent validity of the theory that there are two types of individuals most likely to use OPPIs.

An additional question of interest in Study 1 was whether these same clusters would manifest with the use of fewer classification variables. If the same results can be obtained with only the use of two measures instead of the four measures used by Parks et al. (2012), this would represent a more parsimonious and efficient way of classifying OPPI users. The Centre for Epidemiological Studies – Depression Scale (CES-D; Radloff, 1977) and Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) were chosen as the two predictor measures in another cluster analysis given their brevity (and therefore ease of administering prior to engaging in an OPPI) and representation of both the absence of problematic symptoms and the presence of a sense of well-being. To obtain more information about the generalizability of the findings, this cluster analysis was conducted on the PH2 data set. Using the same statistical approach as with PH1, I hypothesized the best-fitting model would again consist of 2 clusters: a 'distressed' cluster with moderately high CES-D scores and low SWLS scores, and a 'non-distressed' cluster with low CES-D scores and average SWLS scores.

Study 2 included a series of analyses comparing attrition rates and the psychological well-being outcomes of individuals as classified by distress status clusters in Study 1. Such differences in outcome would provide further validation of the relevance and clinical utility of the two-cluster solution for categorizing OPPI users. First, survival analyses were conducted for PH1 and PH2 to explore whether distress level cluster was

an important predictor of attrition over time. I hypothesized attrition rates would be higher across the study for participants classified as distressed. Known demographic predictors of attrition (i.e. age and gender) were then added to these survival models to determine if cluster membership contributed unique predictive utility.

Second, participant reports of psychological well-being were analyzed across time to determine if distressed and non-distressed cluster participants reported different patterns of change after completing the positive psychology exercises. I hypothesized that the distressed cluster participants would report greater improvements to well-being over time (as evidenced by larger increases in satisfaction with life and larger decreases in depressive symptoms). This hypothesis is based on the theory that individuals prone to clinical disorders benefit more from OPPIs. To provide additional corroborative evidence for this, reports of psychological well-being over time were also analyzed according to past or present experience with psychopathology. I expected individuals with a history of psychopathology to experience greater improvements in well-being than those with no past or present experience of a clinical disorder.

Third, I focused on examining exercise temporal orientation and history of psychological treatment as moderators of psychological well-being outcomes over time according to distress status. I hypothesized psychological well-being outcomes would differ over time in the two clusters based on their level of these two moderators. Particularly, I expected distressed cluster users would experience significantly greater improvements in psychological well-being relative to non-distressed cluster users when they engaged in OPPIs categorized by a past orientation. An exploratory approach was

taken for examining history of psychological treatment, with the expectation that would influence changes in well-being over time.

2 General Method

2.1 Methodology

The current study utilized data from two large studies of sixteen different OPPIs. In Project HOPE 1 (PH1), 3460 adult Canadian participants were recruited between October 2007 and January 2008 to participate in a week-long intervention period with follow-up assessments at 1, 3, and 6 months following treatment completion. Recruitment was done through a variety of sources including national newspaper advertisements and flyers distributed on campus at York University; however, Facebook ads contributed to the majority of enrollments. Participants were required to be at least eighteen years old and have daily access to the Internet. Descriptions of the OPPIs are presented in Table 2, and a sample of the exercise instructions can be found in Appendix A. The measures used to represent psychological well-being included the Centre for Epidemiological Studies – Depression Scale (CES-D; Radloff, 1977), the Satisfaction with Life Scale (SWLS; Diener et al., 1985), the Steen Happiness Index (SHI; Seligman et al., 2005), and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). After completing a baseline assessment of demographic information, personality, and baseline measures of psychological well-being, participants were randomly assigned to an exercise condition and provided with a brief rationale for how their activity could improve their psychological well-being and instructions for how to complete the exercise. They were directed to log on to the study website every day to complete a 15 minute

report of their activities. Participants were emailed daily to remind them to visit the website to complete their exercise. All participants were entered into a draw for $1000 after completing the exercise period and each of the follow-up assessments. Reinforcement emails were sent to participants at 2, 4, and 5 months following the intervention period to maintain regular contact with participants and encourage them to continue to use their assigned exercise if they found it helpful.

In Project HOPE 2 (PH2), 3465 adult participants were recruited from countries across the world between April 2010 and January 2011 to participate in a 3-week intervention period with follow-up assessments at 1 and 2 months following treatment completion. Google was the principal method of recruitment although other venues including Facebook and online forums related to psychological well-being were also utilized. Participants were required to be at least eighteen years old, speak English, and have regular access to the Internet. Descriptions of the Project HOPE 2 OPPIs are presented in Table 2, and a sample of the exercise instructions can be found in Appendix B. The measures used to represent psychological well-being included the CES-D and SWLS. Participants were entered into a $1000 draw after completing the post test assessment and each of the follow-up assessments. As in PH1, participants completed a baseline assessment of demographic information, personality measures, and baseline measures of psychological well-being before being randomly assigned to a condition. They were provided with a brief rationale for how their exercise could improve their psychological well-being and instructed to log on to the study website every other day for the following 3 weeks to report on their assigned exercise.

While PH1 and PH2 include many procedural similarities (e.g. random assignment, online format for communication), both the intervention content and sample characteristics were not identical (i.e. were heterogeneous). For example, the PH1 sample was exclusively Canadian, whereas PH2 was open to individuals from countries across the world. Also, participants in PH1 completed their assigned exercise daily for 1 week, whereas participants in PH2 completed their assigned exercise every other day for 3 weeks. Analyzing these data sets separately allowed additional conclusions to be drawn about the generalizability of findings. For example, if a significant effect was found in only one data set, it may be an artifact of the specific parameters of that study. Conversely, the observation of a similar pattern of results in PH1 and PH2 analyses would likely reflect a general response to OPPIs independent of study characteristics such as ethnicity and exercise duration.

2.2 Participant characteristics

The 3460 participants in PH1 ranged in age from 18 to 72 years old ($M = 33$, $SD = 11$). The sample was 81% female and predominantly White (79% White, 5% Asian, 2% East Indian, 2% Middle Eastern, 2% Aboriginal/Inuit, 1% Hispanic, 1% Black, 6% Mixed heritage, 2% Other). The most commonly endorsed religious orientation was Christian (49%) followed by Agnostic (12%), Atheist (8%), Jewish (2%), Islamic (2%), and Buddhist (2%). Less than 1% of the sample reported being Hindu, Sikh, or Chinese Religion (e.g. Taoism, Confucianism), and 22% indicated their religious orientation was "Other". Participants were mostly well-educated, with 51% having completed at least one postsecondary degree and 93% having completed high school. The majority of

participants (53%) reported an annual income of $30,000 or less, and only 4% reported an annual income above $100,000. In terms of relationship status, 40% of participants were single, 18% were currently dating, and 44% were cohabiting or married. Having at least one child was endorsed by 44% of the sample. Upon beginning the study, the PH1 sample had significant depressive symptoms ($M_{CES\text{-}D}$ = 21.78, SD = 14.65). Past or present experience with psychopathology (e.g. depression, anxiety, substance abuse, eating disorder, schizophrenia), psychotherapy, or psychopharmacological treatment was endorsed by 81% of the sample.

The 3465 participants in PH2 ranged from 18 to 80 years old (M = 32, SD = 12). The sample was 64% female and included a variety of ethnic backgrounds (44% White, 33% Asian, 5% Black, 4% East Indian, 3% Hispanic, 3% Middle Eastern, 1% Aboriginal/Inuit, 4% Mixed heritage, and 4% Other). The most commonly endorsed religious orientation was Christian (36%) followed by Hindu (14%), Islamic (14%), Agnostic (9%), Atheist (8%), Buddhist (3%), and Jewish (2%). Less than 1% of the sample reported being Sikh or Chinese Religion (e.g. Taoism, Confucianism), and 13% indicated their religious orientation was "Other". Participants were mostly well-educated, with 65% having completed at least one postsecondary degree and 94% having completed high school. The majority of participants (70%) reported an annual income of $30,000 or less, and only 4% reported an annual income above $100,000. In terms of relationship status, 49% of participants were single, 13% were currently dating, and 38% were cohabiting or married. Having at least one child was endorsed by 33% of the sample. Upon beginning the study, the PH2 sample had significant depressive symptoms

($M_{CES\text{-}D}$ = 21.58, *SD* = 13.13). Past or present experience with psychopathology (i.e. depression, anxiety, substance abuse, eating disorder, or schizophrenia), psychotherapy, or psychopharmacological treatment was endorsed by 72% of the sample.

2.3 Measures

Centre for Epidemiological Studies – Depression Scale (CES-D; Radloff, 1977). The CES-D is a reliable and well-validated measure of depressed mood in the general population (Radloff, 1977; Santor, Zuroff, Ramsay, Cervantes, & Palacious, 1995). Respondents rate the frequency of experiencing 20 common symptoms of depression over the past week (e.g. "I thought my life had been a failure") on a 4-point Likert scale from 0 (*rarely or none of the time, less than 1 day*) to 3 (*most or all of the time, 5-7 days*). Total scores range from 0 to 60, and 16 is the recommended cutoff score for significant depressive symptomatology.

Demographics questionnaire. Adapted from a similar questionnaire used by Seligman et al. (2005), the demographics questionnaire includes items reflecting basic demographic information (age, gender, level of education completed, income, relationship status, ethnicity, and country of residence). Respondents were also asked to indicate whether they had any past or present experience with psychological disorders (depression, anxiety, bipolar disorder, schizophrenia, substance abuse, or eating disorder), psychotherapy, and psychopharmacological treatment.

Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). The PANAS is a self-report measure of one's experience of positive and negative affect. Respondents rate the extent to which they experienced twelve positive and eight negative

mood adjectives in the last week on a 5-point Likert scale from 1 (*very slightly or not at all*) to 5 (*extremely*). Positive affect adjectives include "happy" and "grateful", and negative affect adjectives include "frustrated" and "angry". There is high internal consistency between items, with alpha coefficients ranging from .84 to .90 (Watson et al., 1988), and scores on the PANAS are correlated with measures of depression and anxiety (Crawford & Henry, 2004). Total scores on the positive and negative mood adjectives can be used to calculate an affect balance score. Fredrickson and Losada (2005) recommend using an affect balance ratio of 2.9:1 (positive affect: negative affect) as the lower boundary for the presence of flourishing.

Satisfaction With Life Scale (SWLS; Diener et al., 1985). The SWLS measures an individual's global judgment of life satisfaction. Respondents rate their agreement with five statements (e.g. "In most ways my life is close to ideal") on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). A total score between 5 and 9 suggests extreme dissatisfaction with life, whereas a score above 26 represents satisfaction with life (Pavot & Diener, 1993). The SWLS is both internally reliable (coefficient alpha = .87) and temporally stable (2-month test-retest coefficient = .82) (Diener et al., 1985). SWLS scores are sensitive to changes in life circumstances and show good convergence with other measures of life satisfaction (Pavot & Diener, 1993).

Steen Happiness Index (SHI; Seligman et al., 2005). The SHI is a 20-item self-report measure of happiness across three domains: positive emotion, engagement, and meaning in life. For each item, respondents are presented with five statements related to one of the three definitional aspects of happiness. These statements describe a range of

perceptions about one's experience of that element of happiness over the past week. Each statement is assigned a number from 1 (representing a negative experience) to 5 (representing an extremely positive experience). For example, the statement given a score of 1 in an item related to engagement is "I have little or no energy". The statement given a score of 5 in this case is "I have so much energy that I feel I can do most anything". Seligman et al. (2005) found that the SHI was highly reliable across testing times separated by one week (r = .97) and internally consistent, with an average correlation coefficient of .95. Furthermore, SHI scores were highly correlated with other self-report measures of happiness, including the General Happiness Scale (Lyubomirsky & Lepper, 1999) and Fordyce's (1977) Happiness Scale.

3 Study 1

Study 1 consisted of the replication of the Parks et al. (2012) study investigating the characteristics of OPPI users. These researchers identified two distinct groups of OPPI users: one group who was non-distressed and functioning well on average, and another group who showed signs of psychological distress and poor functioning. The aim of Study 1 was to determine whether the distinction between distressed and non-distressed OPPI users generalizes to other samples. Additional steps were taken to explore whether any of the assumptions underlying the cluster modelling technique were violated. Without correction, such violations can create bias in the resulting cluster models (Everitt . Landau, Leese, & Stahl, 2011).

3.1 Method

As in Parks et al. (2012), the TwoStep Cluster Component method from the SPSS statistical package (version 20) was used to conduct the cluster analyses. TwoStep begins by forming pre-clusters of densely-packed records. This involves merging cases that have identical or very similar patterns of responding on the variables of interest, thereby reducing the number of records that will be compared in the formal clustering phase. The second step uses the agglomerative hierarchical clustering method to group these pre-clusters into distinct clusters. Each pre-cluster is merged with the two closest pre-clusters to create a single cluster. Subsequently, this cluster is merged with the next two closest pre-clusters to create a larger cluster. This process is repeated until all of the pre-clusters are merged into one cluster that includes the entire sample. The program then calculates Bayesian information criterion (BIC) values for the cluster solutions from 1 cluster to 15 cluster models to identify how well each successive cluster solution includes distinctive clusters. Finally, it automatically calculates the optimal cluster number based on the point where an additional cluster does not appreciably improve the BIC value. The main benefits of the TwoStep method are that it manages large data sets more effectively than traditional methods such as k-means and expectation-maximization and, due to the use of log-likelihood estimation, both continuous and categorical variables can be used to create cluster models (SPSS Inc., 2001).

Parks et al. (2012) compared the fit of several cluster models using different combinations of demographic and mood variables as the basis for cluster composition (A. Parks, personal communication, October 30, 2012). The model with the best fit (i.e.

identified by the TwoStep procedure as having the optimal BIC value) was based on four mood variables: depressive symptoms (Centre for Epidemiological Studies-Depression Scale; CES-D, Radloff, 1977), life satisfaction (Satisfaction with Life Scale; SWLS, Diener et al., 1985), affect balance (Positive and Negative Affect Scale; PANAS, Watson et al., 1988), and general happiness (Authentic Happiness Inventory; AHI, Seligman et al., 2005). PH1 included the same set of mood measures[3], whereas PH2 only included the CES-D and SWLS. Thus, a cluster analysis was conducted first with data from PH1 to provide a true replication. Three models were tested using the TwoStep Cluster Component method. The first model included both demographic variables (i.e. age, gender, education, ethnicity, income, and history of psychopathology) and baseline well-being variables (i.e. depressive symptoms, life satisfaction, affect balance, and general happiness). The second model tested only the demographic variables, and the third model tested only the baseline well-being variables.

A second cluster analysis was conducted using the data from PH2 to explore whether the distinction between distressed and non-distressed OPPI users generalizes to a more diverse global sample and whether including only the CES-D and SWLS in the model would produce similar cluster results. Again, three models were tested. The first model included both demographic variables (i.e. age, gender, education, ethnicity, income, and history of psychopathology) and baseline well-being variables (i.e. depressive symptoms and satisfaction with life). The second model tested only the demographic variables, and the third model tested only the baseline well-being variables.

[3] The measure of general happiness in PH1 was the Steen Happiness Index (SHI; Seligman et al., 2005), which includes 20 of the 24 items that comprise the AHI.

Goodness of fit of the cluster models was determined by the silhouette measure of cluster cohesion and separation (Kaufman & Rousseeuw, 1990). The value produced by this measure represents the average distance of participants' scores from the centre of the cluster they belong to relative to the centre of the nearest cluster that they do not belong to. A silhouette coefficient equal to 1 indicates all participant scores fall directly on the centre of the cluster they belong to, whereas a silhouette coefficient equal to -1 indicates all participant scores fall on the centre of a cluster that they do not belong to. A coefficient of 0 indicates participant scores are, on average, equidistant to the centre of their own cluster and the nearest other cluster. A poor fit of the cluster model is indicated by a silhouette coefficient of .20 or less, a fair fit is indicated by a coefficient between .20 and .50, and a good fit is indicated by a coefficient of .50 or more.

3.2 Results

Of the 3460 participants in PH1, 1076 were excluded from the cluster analyses due to missing data. Likewise, 736 of 3465 PH2 participants were not included in the cluster analyses. In most cases, these individuals withdrew from the study prior to completing all of the baseline measures.

In PH1, the best solution was a two-cluster solution based on CES-D, SWLS, SHI, and PANAS scores (silhouette coefficient = .50; see Table 3 for descriptive statistics). Cluster 1, which was called the "distressed cluster" (n = 1453) included participants with high levels of depressive symptoms, low life satisfaction and happiness, and an equal amount of positive and negative affective experiences. Cluster 2, which was called the "non-distressed cluster" (n = 931) included participants with low levels of

depressive symptoms, high life satisfaction, moderate amounts of happiness, and over four times more positive than negative affective experiences.

Everitt et al. (2011) noted that outliers and violation of the assumptions of general linear modelling can create significant bias in the results of a model-based cluster analysis. In the cluster model above, no significant outliers were detected, although the distribution of CES-D scores was positively skewed. To correct for this violation of the assumption of a normal distribution, the cluster analysis was re-run using a square root transformation of CES-D scores. Again, the best solution was a two-cluster model based on the four well-being measures (silhouette coefficient = 0.55). Cluster 1 (n = 1296) was also identified as a "distressed cluster" with slightly higher levels of depressive symptoms, slightly lower life satisfaction and happiness, and a smaller ratio of positive to negative affective experiences than the distressed cluster that emerged from the non-transformed data. Cluster 2 (n = 1088) was consistent with the original "non-distressed cluster" and featured low levels of depressive symptoms, high life satisfaction, moderate happiness, and more positive than negative affective experiences.

The best solution for the cluster analysis in PH2 was a four cluster solution based on the two well-being measures (silhouette coefficient = 0.50; see Table 3 for descriptive statistics). Cluster 1 (n = 508) was named the "low-functioning distressed cluster" and characterized by high levels of depressive symptoms and low satisfaction with life. Cluster 2 (n = 1003) was a "non-distressed cluster", featuring low levels of depressive symptoms and high levels of satisfaction with life. Cluster 3 (n = 509) featured both high levels of depressive symptoms and life satisfaction and was thus called the "high-

functioning distressed cluster". Cluster 4 (n = 709) was named the "pessimistic cluster" and characterized by mild to moderate levels of depressive symptoms and low life satisfaction.

As with PH1, this data set was explored for potential outliers and violations of the assumptions of general linear modelling. No significant outliers were detected, but again the distribution of CES-D scores was positively skewed. With the application of a square-root transformation on CES-D scores, the best fitting solution for the revised cluster analysis now became a two-cluster solution based on the well-being measures only (silhouette coefficient = 0.50). Cluster 1 (n = 1410) was named the "distressed cluster" due to a pattern of high levels of depressive symptoms and low life satisfaction. Cluster 2 (n = 1319) was called the "non-distressed cluster" and characterized by low levels of depressive symptoms and high life satisfaction.

3.3 Discussion

The cluster analyses presented here provide supportive evidence for the hypothesis that a two-cluster solution based on pre-intervention well-being status describes OPPI users well. The results obtained using the PH1 and PH2 data sets were strikingly similar to the findings reported by Parks et al. (2012). The first group included individuals in a state of acute distress, reporting significant depressive symptoms and a dearth of pleasant experiences. These individuals are likely drawn to OPPI studies by a desire to find relief for their symptoms. The second group of OPPI users included non-distressed individuals who already experience a moderate amount of psychological well-

being. These individuals are likely drawn to OPPI studies by a desire for self-enrichment and the maximization of their psychological well-being.

The finding of consistent results using only the CES-D and SWLS in PH2 supports the hypothesis that the distinction between distressed and non-distressed OPPI users can be made with the use of only two measures. This represents a more parsimonious method of classifying OPPI users than classification based on four measures. Future research should investigate whether this classification method produces equally reliable cluster models in other samples to determine if the above findings generalize across OPPI studies.

Unexpectedly, the first cluster analysis performed on the PH2 data set prior to accounting for assumption violations suggested a four-cluster solution based on mood measures alone provided the best fit. The first two clusters were consistent with the distressed and non-distressed groups identified above. A third "high-functioning distressed" cluster included participants who were experiencing high levels of depressive symptoms while also maintaining a sense of satisfaction with their lives. A fourth "pessimistic" cluster was experiencing mild to moderate depressive symptoms and average life satisfaction. Interestingly, these additional clusters were not replicated in the recalculated cluster solution when CES-D scores were transformed to account for a skewed distribution. Thus, the four-cluster solution may be explained as a form of bias resulting from the violation of one of the assumptions of general linear modelling. However, given that the same pattern of results did not occur in the PH1 data set (where both the original and transformed data suggested the best fitting model was a two-cluster

solution), this may also be an indication that this particular method of cluster analysis may have some limitations.

The TwoStep Cluster Component method was chosen to test the hypothesis that OPPI users can be meaningfully categorized by distress level primarily because it allowed for the replication of prior findings of a two-cluster solution in a study by Parks et al. (2012). There are several limitations to the information provided by this approach, however. For example, the TwoStep method is dependent on the order of cases in the data set, and thus may produce biased results if the cases are not randomized (Bacher, Wenzig, & Vogler, 2004). In the current study, cases were ordered based on when participants signed up for the study. This could increase the likelihood that participants who signed up at similar times appear closer in distance during the initial stages of the clustering process. A second issue is that TwoStep is not able to detect solutions where the best fitting model is a solution with only one cluster (Bacher, Wenzig, & Vogler, 2004). This artificially inflates the likelihood that one will conclude there are distinguishable subgroups within a given sample.

Additionally, TwoStep provides limited information about within-cluster variability, which can be useful for determining whether there is a large amount of overlap between clusters or so much "noise" within clusters as to render them statistical artifacts. While the silhouette coefficient describes the average within-cluster variability, information about the range of within-cluster data would be useful for determining the consistency of the clusters. For example, are all individuals in the distressed cluster uniformly high in depressive symptoms and low in life satisfaction, or do scores range

from moderate to high/low? Within-cluster variability has implications for the conclusions made about how well the optimal cluster solution differentiates participant types.

Also of note, a sizable proportion of participants were not included in the cluster analysis due to early attrition. These participants (31% of the PH1 sample and 21% of the PH2 sample) dropped out of the study prior to completing the baseline measures. These individuals were also excluded from subsequent Study 2 analyses due to their lack of cluster assignment. Several possible reasons may have contributed to this early attrition, including not being able to meet the time restriction (baseline measures were only available for 48 hours), boredom with the questionnaires (which required approximately 1 hour to complete), and lack of ongoing interest in the research project. Participants had not received specific information about the nature of their OPPI activity at this point, so it is unlikely that these participants dropped out due to some problem with the OPPIs themselves. Given that motivation has a significant impact on the effectiveness of OPPIs (Lyubomirsky et al., 2011), the outcome findings may have been artificially altered if these unmotivated participants had chosen to remain in the study. It would be informative to explore this subset of participants in more detail, as they may represent an invisible third group of individuals who seek out OPPIs but are not yet able to commit to participating in OPPI activities like their distressed and non-distressed counterparts who remained in the study.

Given the limitations inherent in the TwoStep method, conclusions drawn about the validity of the two-cluster solution obtained in this study must be tentative. A crucial

next step is to explore whether similar findings emerge with the use of other cluster analysis methods that are not subject to these limitations. For example, latent class cluster analysis is a model-based approach to cluster analysis that uses probability distributions to determine a best-fitting cluster solution (Vermunt & Magidson, 2002). It is more flexible than the TwoStep method in terms of the parameters of cluster solutions and provides more detailed information about score distributions within clusters. If a similar two-cluster solution were obtained with a latent class cluster analysis, it would provide additional validation of the findings based on the TwoStep procedure.

Finally, it is important to remain mindful that the cluster solution obtained in these analyses represents only one of many ways of meaningfully differentiating between participant types. Several demographic, personality, and mood variables have been considered to date, but there may be other equally valid ways of clustering participant data when different variables are included in the cluster analyses. Alternatively, one could investigate whether clusters can be formed based on the trajectory of well-being changes over time as opposed to just baseline levels of well-being. Identifying alternative ways that OPPI users can be classified would be useful for helping to predict who is most likely to benefit from engaging in OPPIs. Additionally, it may be worthwhile to consider whether the information lost in the process of dichotomozing OPPI users limits our understanding of this heterogeneous group of people. As previously noted, within-group differences in the two clusters have yet to be explored. If within-group variability is high, a dimensional approach to conceptualizing differences between OPPI users (e.g. by degree of distress at baseline) may be more applicable.

4 Study 2

Having identified two types of people who seek out OPPIs ("distressed" and "non-distressed" cluster users) in Study 1, the objective of Study 2 was to explore whether the use of OPPIs over time produced different outcomes in these two subgroups. This information is needed to provide further validation of the two-cluster categorization of OPPI users and determine whether the distinction between types of OPPI users is an important factor to consider when predicting the efficacy of OPPI activities. While these two types of people both demonstrate an interest in engaging in OPPIs, do they have a different experience of the activities? Based on the existing literature described above, there is inconsistent evidence for different psychological well-being outcomes in distressed and non-distressed samples. I hypothesized that change in psychological well-being over time would differ based on distress status, with distressed cluster individuals showing greater improvement. Furthermore, I predicted this pattern would also hold for past or present experience with clinical disorders as evidence of a general trend towards greater gains for OPPI users with greater psychological deficits.

I also hypothesized that the temporal orientation of the OPPI activities would moderate the relationship between distress status and changes in psychological well-being over time. Specifically, I predicted past-oriented OPPIs would prove relatively more efficacious for distressed cluster participants due to a cognitive bias towards the past. Third, I explored whether history of psychotherapy plays a moderating effect on well-being outcomes within the context of distress level or more broadly (i.e. interacting with the passage of time only). Additionally, I hypothesized that attrition rates would be

higher for distressed cluster participants, reflecting their higher levels of emotional turmoil and difficulty engaging in a self-directed study. I expected these differences to persist when age and gender as demographic indicators of attrition known in the literature to influence attrition were included (Geraghty et al., 2010; Sergeant & Mongrain, 2011; Shapira & Mongrain, 2010).

4.1 Method

As a first step, attrition across distressed and non-distressed participants as identified by the cluster analyses from Study 1 was considered as an indicator of OPPI effectiveness. Survival analyses were utilized to compare rates of attrition between clusters. Separate analyses were conducted for PH1 and PH2 data, and the models were then re-run with the inclusion of age and gender to determine if the cluster effects provided unique predictive information above and beyond known indicators of attrition (Geraghty et al., 2010; Sergeant & Mongrain, 2011; Shapira & Mongrain, 2010).

Next, multilevel models were used to test the hypothesis that psychological well-being differed based on the interaction of time and distress level (i.e. Cluster). The two outcome measures (CES-D and SWLS) were modelled separately, and again conducted independently for PH1 and PH2 data. Thus, there were four models in total: 1) predicting CES-D scores in PH1, 2) predicting SWLS scores in PH1, 3) predicting CES-D scores in PH2, and 4) predicting SWLS scores in PH2. These models were run again with history of psychopathology replacing distress level to determine if a similar pattern of "greater benefits with greater deficits" occurred.

Another set of multilevel models was then conducted utilizing the same framework, but with the addition of exercise temporal orientation as an additional predictor to explore whether the temporal orientation of the OPPIs moderated the effects of time and/or distress level (Cluster) on psychological well-being. A third set of multilevel models followed using the same procedure, with history of psychotherapy replacing exercise temporal orientation to explore whether experience with psychotherapy moderated the effects of time and/or distress level (Cluster) on psychological well-being.

Due to the large amount of missing data due to attrition in PH1 and PH2, there was also concern about potential bias in the multilevel model findings. For example, it may be that participants who were not experiencing improvements in well-being as a result of practising OPPI exercises were more likely to drop out, thereby failing to provide data on their lack of improvement. As a result, the observed data would only reflect positive experiences associated with OPPI use, and tests of change in well-being over time would be more likely to find significant effects. To explore this issue further, a sensitivity analysis was included using an intention-to-treat approach to explore whether the inclusion of data from missing participants would have had an appreciable effect on multilevel modelling outcomes.

The alpha level for all significance tests was set at .05 to account for the exploratory nature of the analyses and follow precedent set by previous OPPI studies involving a similar number of tests.

4.2 Results

Survival Analyses

Survival analyses were conducted separately for the PH1 and PH2 samples using regression analyses based on Cox's proportional hazards model in the SPSS statistical package. "Survival" was operationalized as the number of assessment points completed before dropout occurred. A hazard ratio was provided along with the tests of significance to reflect the probability of dropout in the non-distressed cluster relative to the distressed cluster. These models were run again with Age and Gender included as predictors of attrition along with Cluster to determine if the effects of Cluster remained after accounting for known demographic predictors of attrition.

The data was checked for middle missingness, which occurs when a participant has missing data for one assessment point but returns for a subsequent assessment. The normal procedure for calculating attrition uses the first instance of missing data to identify the point of dropout, but for cases of middle missingness this will be inaccurate as these participants are not considered true study drop-outs at the first occasion of missing data. In PH1, there were 145 cases of middle missingness (3% of the total sample), and in PH2, there were 433[4] cases (13% of the total sample). Time to dropout was recalculated for these cases to reflect completion of subsequent assessments.

Attrition rates over time for PH1 and PH2 are reported in Table 4. In PH1, 79.6% of the original sample dropped out at some point prior to completion of the study. The

[4] At the post-test assessment, there was a computing error which led to the loss of some post-test participant data. Indeed, 337 of the cases (10% of the total sample) of middle missingness in PH2 were due to missing the post-test assessment but completing at least 1 subsequent assessment. With this source of error in mind, the amount of middle missingness appears to be consistent across PH1 and PH2.

highest attrition rate (27.5% of the original sample) occurred prior to completion of the 1-week follow-up assessment. A sizeable proportion of attrition also occurred prior to completion of the baseline measures (20.9% of the original sample), before an exercise was assigned to the participant. In PH2, 80.2% of the original sample dropped out at some point prior to completion of the study. As in PH1, attrition was most common prior to completion of the post-test assessment, although the rate of attrition was higher (43.8% of the original sample) and the post-test assessment occurred after a 3-week intervention period. Also like PH1, the second highest attrition rate occurred prior to completion of the baseline questionnaires before exercises were assigned. An additional 20.3% of the original sample dropped out of the study at this point.

The first hazard model regressed Cluster on Time to Dropout for participants in PH1. This model was not significant, $\chi^2(1) = 1.39$, $p = .238$, hazard ratio (HR) = 1.06. Thus, the distressed cluster was no more likely to drop out over the course of the study than the non-distressed cluster. The same model was constructed using the PH2 data set, and this model was significant, $\chi^2(1) = 7.14$, $p = .008$, HR = 0.89. Thus, the relative risk of attrition for the non-distressed cluster was only 89% of the risk in the distressed cluster group. Overall, 77.59% of the distressed cluster and 72.48% of the non-distressed cluster had dropped out by the end of the study.

When Age and Gender were added to the PH1 model, Cluster was still a non-significant predictor of attrition, $\chi^2(1) = 0.56$, $p = .46$, HR = 1.04. Following the same procedure with the PH2 model, Cluster again was a significant predictor of attrition,

$\chi^2(1) = 5.42, p = .02$, HR = 0.89. Thus, distress level clustering was still an important predictor of dropout even after age and gender differences were accounted for. Consistent with the original model, the non-distressed cluster was at lower risk of dropout from the study than the distressed cluster in the PH2 sample.

*Multilevel Models with Time*Cluster Interaction*

Mixed multilevel models with maximum likelihood estimation were used to determine whether psychological well-being outcomes differed across distress cluster status. This is currently the method *de rigueur* recommended for longitudinal data with missing values, as it allows for maximum data retention and accounts for variation in the trajectory of scores over time between individuals nested within the same group as well as the effect of baseline score on trajectoriesover time (Christensen, Griffiths, & Farrer, 2009). The "proc mixed" procedure in SAS was used to test these models. All models were examined for outliers and the violation of the assumptions of linear regression modelling techniques. Due to the large sample sizes, these models were considered robust and only very extreme outliers or violation assumptions were corrected for.

Previous OPPI studies have observed that outcome score trajectories tend to reflect large changes immediately after the exercise period followed by a relatively stable pattern across follow-up (e.g. Sergeant & Mongrain, 2011). Due to the linearity assumption inherent in the multilevel modelling procedure, the large short-term effects are often diluted when all time points are considered together. To explore whether unique short-term effects were present in the current study, the Time variable was re-coded into an indicator variable labeled "Exercise Completion." The baseline time point was given a

value of 0, and all post-test time points were given a value of 1. Given that the effect for each predictor variable in a multilevel model is calculated while holding all other predictors constant, including Exercise Completion in the multilevel models alongside the original Time variable altered the interpretation of Time to reflect only the post-test time points (i.e. the levels of Time not accounted for by Exercise Completion). The resulting findings included Short Term Effect (STE) drawn from the Exercise Completion predictor effect to reflect changes upon treatment completion and Long Term Effect (LTE) drawn from the Time predictor effect to reflect changes across the follow-up period of the entire study.

The first model fit participant scores on measures of psychological well-being to the two time variables (STE and LTE) and Cluster (distressed and non-distressed) as predictor variables. Cluster was entered as a class variable so that the resulting fixed effects reflect estimates for scores in the distressed cluster relative to scores in the non-distressed cluster. The 2-way interaction terms of STE*Cluster and LTE*Cluster indicated whether changes in the facets of well-being over time were greater in the distressed cluster than in the non-distressed cluster. Significant effects involving the LTE variable were further investigated using post hoc *t*-tests of all possible pairwise comparisons involving the four post-test time points. A Tukey correction was applied to the significance tests for these post hoc comparisons to control for familywise error. Non-significant interaction terms were followed with an exploration of the main effects of the time variable to determine if there were any overall changes over time for the sample as a whole.

Descriptive statistics for CESD and SWLS scores over time across the two clusters in PH1 are reported in Table 5. The multilevel model results are presented in Table 6. In the CES-D model, both STE*Cluster and LTE*Cluster effects were significant, indicating participants in the distressed cluster experienced a greater reduction in depressive symptoms both immediately following exercise completion and across the follow-up period than their non-distressed cluster counterparts. Post hoc pairwise comparisons of the four post-test time points (1 week, 1 month, 3 months, 6 months) were conducted within each cluster (Table 7). In the distressed cluster, CESD scores significantly decreased between 1 week and 3 months. The remaining pairwise comparisons were non-significant, suggesting that CESD scores in the distressed cluster remained stable across the follow-up assessment points. Thus, the improvements achieved at post-test were maintained by the end of the study. In the non-distressed cluster, none of the pairwise comparisons were significant, indicating CESD scores did not change significantly across the follow-up period for those individuals.

The model predicting SWLS scores (Table 6) also included significant STE*Cluster and LTE*Cluster interaction effects. Participants in the distressed cluster reported greater increases in satisfaction with life than their non-distressed counterparts following both the week-long exercise period and the follow-up period. Post hoc pairwise comparisons of the follow-up time points (Table 7) indicated that in the distressed cluster, significant increases in SWLS scores occurred between 1 week and 3 months, 1 week and 6 months, and 1 month and 3 months. Thus, satisfaction with life improved over the exercise period and continued to increase of the follow-up period for distressed

participants. In the non-distressed cluster there were no significant changes in SWLS scores between any of the follow-up assessment points.

The same set of analyses was run for the PH2 data set (see Table 5 for descriptive statistics and Table 6 for multilevel model results). The CES-D model identified a larger decrease in depressive symptoms for the distressed cluster following the three week exercise period, as evidenced by a significant STE*Cluster interaction effect. There were no significant differences in CES-D scores across the follow-up period for the distressed and non-distressed clusters (i.e. LTE*Cluster effect). Thus, as in PH1, the distressed cluster in PH2 experienced a greater reduction in depressive symptoms after completing 3 weeks of OPPI practice, and these gains were maintained for 2 months afterward. The main effect for LTE was not significant, reflecting stability of CES-D scores during the follow-up period for all participants.

The model fitting SWLS scores also included a significant interaction effect for STE and Cluster. Participants in the distressed cluster exhibited a greater increase in life satisfaction after the three week exercise period. Conversely, effect estimates were not significant for both the LTE by Cluster interaction and the LTE main effect. Thus, satisfaction with life did not significantly change over the follow-up period for participants as a whole. This indicates that the greater improvements in life satisfaction observed immediately after completion of the 3-week OPPI practice were maintained over the 2 month follow-up period.

*Multilevel Models with Time*History of Psychopathology Interaction*

In the second set of models, History of Psychopathology was entered as a class variable and the resulting estimates represented predicted scores for individuals endorsing past or present psychopathology relative to those endorsing no history of clinical disorder. Descriptive statistics for CESD and SWLS scores over time by History of Psychopathology are reported in Table 8, and multilevel model results are presented in Table 9.

In PH1, the STE*History of Psychopathology effect was a significant predictor of CES-D scores. Participants endorsing psychopathology were estimated to experience a 2.05-point greater decrease in depressive symptoms after the 1-week exercise period than those with no history of psychopathology. There were no differences by History of Psychopathology across the follow-up period, suggesting depressive symptoms over the follow-up period were not influenced significantly by experience with clinical disorders. Likewise, SWLS scores were not significantly predicted by either STE*History of Psychopathology or LTE*History of Psychopathology. Susceptibility to clinical disorders was thus unrelated to life satisfaction outcomes following OPPI use in PH1.

The same pattern of results was found in PH2. The STE*History of Psychopathology effect predicting CES-D scores was significant, reflecting a 3.59-point greater decrease in predicted depressive symptoms for individuals with a history of psychopathology relative to those with no history of psychopathology. The LTE*History of Psychopathology effect predicting CES-D scores was not significant, as were the effects predicting SWLS scores. Therefore, experience with clinical disorders did not

significantly impact predictions of satisfaction with life over time or long-term changes in depressive symptoms in PH2.

Influence of Exercise Temporal Orientation

To test the hypothesis that temporal orientation of the OPPI moderated the relationship between OPPI cluster and outcome, a second set of models was created using the predictors from the first model as well as the factor variables described above. The 3-way interaction terms of STE*Cluster*Temporal Orientation and LTE*Cluster*Temporal Orientation were explored to test the hypothesis that distressed participants (but not non-distressed OPPI consumers) would demonstrate greater improvements in psychological well-being over time when they were using past-oriented OPPIs. The resulting estimates were framed in terms of whether the difference was greater in the distressed cluster than in the non-distressed cluster. Significant effects involving LTE and/or Temporal Orientation were followed-up with pairwise comparisons in order to clarify which levels significantly differed. For example, the pairwise comparisons of a significant effect of Temporal Orientation on a psychological well-being variable would compare outcome scores between Past-Oriented and Present-Oriented exercises, Past-Oriented and Future-Oriented exercises, and Present-Oriented and Future-Oriented exercises. A Tukey correction was applied to the significance tests for these post hoc comparisons to control for familywise error. Where no 3-way interactions were significant, lower order effects were explored to determine if the temporal orientation of the OPPIs had any effect on well-being.

As reported in Table 10, none of the 3-way interactions effects were significant predictors of either CES-D or SWLS scores in PH1. Thus, the temporal orientation of the exercises did not impact reports of depressive symptoms or satisfaction with life over the course of the study differently for distressed and non-distressed clusters. A significant STE*Cluster term in the CES-D model reiterated the previous finding of larger decreases in depressive symptoms for the distressed cluster following the 1-week exercise period. The only significant effect in the SWLS model was a main effect for Cluster, indicating the distressed cluster reported lower life satisfaction overall than the non-distressed cluster.

Results for the PH2 model (Table 11) also included non-significant 3-way interaction effects for both the CES-D and SWLS. Again, Temporal Orientation did not moderate the relationship between Time and Cluster. A significant STE*Cluster effect in the CES-D model indicated the distressed cluster reported larger decreases in depressive symptoms following the 3-week exercise period. A significant Cluster effect in the SWLS model indicated the distressed cluster reported lower life satisfaction overall than the non-distressed cluster.

Influence of History of Psychotherapy

History of Psychotherapy was explored as a moderator variable using the same procedure as the analyses involving exercise Temporal Orientation. To reiterate, this involved constructing models for CES-D and SWLS scores using time, distress level cluster, and experience with psychotherapy as predictors and then exploring the 3-way interaction terms of STE*Cluster*History of Psychotherapy and LTE*Cluster*History of

Psychotherapy. Significant effects were followed by pairwise comparisons to illuminate the nature of the effect, and non-significant effects were followed by examination of lower order effects to determine if history of psychotherapy had any effect on well-being.

In PH1 (model results in Table 12), there was a significant effect for the combination of LTE, Cluster, and History of Psychotherapy. Post hoc pairwise comparisons of the 4 follow-up time points are reported in Figure 1 along with the means for each group. Participants in the distressed cluster with past experience of psychotherapy experienced additional improvements in satisfaction with life over the follow-up period, whereas there were no such improvements in life satisfaction for both the non-distressed cluster with a history of psychotherapy and all participants without a history of psychotherapy. Thus, past experience with psychotherapy conferred greater long-term benefits to life satisfaction for the distressed cluster. The other 3-way interaction terms were non-significant, indicating that History of Psychotherapy did not have any additional moderating effects on the relationship between time and distress level cluster as predictors of well-being. A significant STE*Cluster effect in the CES-D model reiterated earlier findings of greater decreases in depressive symptoms following the 1-week exercise period for the distressed cluster. Furthermore, a significant main effect for History of Psychotherapy reflected greater depressive symptoms overall for individuals with previous experience in therapy.

The PH2 models (Table 13) included a significant STE by Cluster by History of Psychotherapy effect predicting CES-D scores. This indicates that History of Psychotherapy moderated the prediction of depressive symptoms based on STE and

Cluster. The moderation effect (plotted in Figure 2) featured a greater decrease in depressive symptoms following 3 weeks of OPPI practice for participants in the distressed cluster with no history of psychotherapy relative to both participants in the distressed cluster with a history of psychotherapy and the entire non-distressed cluster. Other 3-way interaction effects were non-significant, indicating History of Psychotherapy did not moderate any relationships between time and distress level cluster as predictors of well-being in PH2. Of note, a 2-way interaction of STE and Cluster was significant in the SWLS model, reflecting the previous finding of greater increases in life satisfaction for the distressed cluster following completion of the 3-week intervention period. History of Psychotherapy also had a significant main effect in the model predicting SWLS scores, indicating that participants with no experience of therapy reported higher life satisfaction than those with experience in therapy.

Sensitivity Analyses

The intention-to-treat approach to data analysis involves including all participants in the analytic process regardless of whether they provided outcome data or not. In the present study, this analysis was used to test the sensitivity of the previous multilevel model tests to attrition bias. Specifically, if the significant effects reported above disappear when missing data is better accounted for, this may be an indication that the effects were driven by only those participants who chose to stay in the study, rather than a true effect of the OPPI exercises themselves. A common method for conducting a sensitivity analysis using intention-to-treat is to estimate placeholder values for missing values. The last-observation-carried-forward technique (LOCF) is a popular form of this

method in longitudinal data sets, where missing values are replaced with the last observed value for that particular measure. The implicit assumption in this approach is that dropouts do not report changes on the variable of interest once they have left the study (Rubin, 1996). In OPPI research, little is known about patterns of change on outcome variables for individuals who drop out early. As a result, one cannot be certain that the LOCF method would provide an accurate representation of missing data in the present study.

Instead, the multiple imputation procedure (Horton & Lipsitz, 2001; Rubin, 1996) was chosen to better reflect the uncertainty about patterns of responding in participants with missing data.. This procedure involved creating 10 multiple imputations for missing data in order to produce a sample of estimated values. The imputations were computed using the Markov chain Monte Carlo (MCMC) method, which uses a combination of observed data and estimates of random error to produce simulated data values (Schafer, 1997). The MCMC method assumes data are normally distributed and missing at random (MAR). Unlike the missing completely at random (MCAR) assumption which presumes missingness is not related to any known or unknown factor in the study, MAR allows missingness to depend on observed values (Horton & Lipsitz, 2001). Thus, the fact that the survival analysis found missingness was influenced by cluster membership does not prevent meeting the MAR assumption, as Cluster was included in the imputation process. The multilevel models were run on each imputed data set, and the resulting parameter estimates were combined to produce a single estimate for the effects representing what would have emerged if dropouts had remained in the study and provided outcome data.

To determine if missing data had a significant influence on the multilevel model results, original effect estimates based on observed data only were compared to estimates and corresponding confidence intervals for imputed data sets. The imputed estimates were considered similar to the original estimates if the original estimate was within the 95% confidence interval of the imputed estimate. The *p* values were also compared between the original and imputed estimates to explore whether the same significant effects would have emerged without attrition. A comparison of the original and imputed effect estimates can be found in Table 14. In PH1, all of the original effect estimates for the CES-D models were within the 95% confidence interval calculated for the imputed estimates. Furthermore, the significant STE*Cluster and LTE*Cluster effects observed in the original data set were also present in the imputed data set. Thus, in PH1, attrition did not influence results of the models predicting CES-D scores. While the same conclusion generally holds for SWLS scores as well, there were dissimilarities between the original and imputed estimates of the STE*Cluster and LTE*Cluster*History of Psychotherapy. The estimate for STE*Cluster was statistically significant in both the original and imputed data sets, but the effect estimate value in the original sample fell below the 95% confidence interval of the imputed estimate. This suggests attrition may have reduced the magnitude of improvements in life satisfaction found in distressed OPPI users. Conversely, the original estimate for LTE*Cluster*History of Psychotherapy fell above the 95% confidence interval of the imputed estimate, and only the original estimate reached statistical significance. This suggests the moderating effect of experience with

psychotherapy may not have appeared if participants who dropped out had remained in the study.

In PH2, all of the original estimates fell within the 95% confidence interval for the imputed estimates. Thus, attrition was unlikely to have produced any major bias in the results. In one case – the effect for STE*Cluster*History of Psychotherapy as a predictor of depressive symptoms – only the original estimate was statistically significant, indicating the effect may have been hidden by large sample size if none of the participants had dropped out. Interestingly, the effect for LTE*Cluster as a predictor of life satisfaction only reached statistical significance in the imputed data set. Thus, while attrition did not appear to affect the value of the estimate, it may have influenced the ultimate conclusion about the significance of the effect.

4.3 Discussion

Study 2 investigated whether distressed and non-distressed OPPI users respond differently to OPPIs. This issue was first explored in the context of attrition. In both PH1 and PH2, approximately 80% of participants dropped out prior to completion of the 2-month follow-up. While exceedingly high, these rates are consistent with other OPPI studies (Table 1), suggesting the current findings are valid representations of typical participation patterns. When cluster membership based on distress status was considered as a predictor of attrition, participants in the distressed cluster in PH2 were more likely to drop out over the course of the study than participants in the non-distressed cluster. This effect remained when demographic predictors of attrition were also considered, which suggests that clustering based on distress status had a unique influence on attrition in PH2

above and beyond the effects imparted by age and gender. While the distressed cluster in PH2 was at a greater risk of dropout across the study, the actual rate of attrition only differed from the non-distressed cluster by 5.1%. Considered together with the lack of difference in attrition rates based on distress level in PH1, this suggests level of distress is only a minor predictor of OPPI attrition.

The distressed cluster in PH2 may have experienced higher dropout due to greater difficulty meeting the demands of the OPPI exercises. Indeed, previous research reported higher attrition rates for individuals with more severe baseline depressive symptoms (Sergeant & Mongrain, 2011; Shapira & Mongrain, 2010). Being asked to think about things to be grateful for or perform random acts of kindness towards others may seem impossible to an individual who feels hopeless or distressed. OPPI exercises often require practice to develop skills over time, and early failures may also be more difficult for these distressed individuals to cope with. As a result, they would be less likely to provide data about how they were responding to OPPI exercises over time. This has important implications for the generalizability of findings from data collected by OPPI studies, as they may not reflect the experiences of distressed OPPI users as well as their non-distressed counterparts who are contributing a greater proportion of observed data. Given that attrition can be viewed an indicator of poor treatment efficacy (Geraghty et al., 2010), higher attrition rates for distressed individuals may also indicate OPPIs are not as effective for highly distressed users as they are for non-distressed users. The difference in intervention duration (1 week in PH1 and 3 weeks in PH2) may have also played a role in the finding of no differences in PH1, in that the shorter exercise period may have been

easier for distressed individuals to engage with and provided fewer opportunities for frustration. The studies also differed in terms of their cultural composition and the timing of follow-up assessments, both of which could also potentially influence the relationship between distress level and attrition. It was beyond the scope of this study to control for or statistically analyze the differences between PH1 and PH2. Thus, distress status may be worthwhile to consider in terms of attrition rates in OPPI studies, although the relationship is nuanced in a way that remains unclear. Furthermore, the similarities in attrition rates in PH1 suggest distressed OPPI users fare almost as well as their non-distressed counterparts in terms of study retention under the right circumstances. The next task for future research is to clarify what these circumstances are. As highlighted by the present study, factors that may be candidates include intervention duration, culture, and timing of follow-up assessments.

Differences between distressed and non-distressed clusters of OPPI users were next explored in the context of longitudinal psychological well-being outcomes. Results indicated distress cluster was a significant predictor of differential benefits. In PH1, the distressed cluster reported greater reductions in depressive symptoms and increases in life satisfaction than the non-distressed cluster after exercise completion. Over the course of the 6-month follow-up period, depressive symptoms and satisfaction with life continued to improve in the distressed cluster as well. In PH2, the distressed cluster also reported greater reductions in depressive symptoms and increases in life satisfaction than their non-distressed cluster counterparts. The non-significant findings for long-term well-being outcomes indicated that both distressed and non-distressed clusters of OPPI users

experienced relatively stable levels of depressive symptoms and life satisfaction after completing OPPIs. The fact that short-term improvements in well-being did not disappear for at least 2 months following exercise completion suggests that the OPPIs were effective at producing lasting changes in psychological well-being for distressed users in particular. Altogether, these findings suggest that distressed OPPI users experience benefits after practising OPPIs greater than those observed in non-distressed OPPI users. Building upon the cluster analyses findings from Study 1 and Parks et al. (2012), this is also the first evidence that the distinction between distressed and non-distressed OPPI users is useful for predicting who will benefit most from using OPPIs.

The finding of superior benefits for the distressed cluster of OPPI users is consistent with previous studies that have reported greater efficacy of OPPIs for individuals who are lacking in positive experiences (e.g. Mongrain & Anselmo-Matthews, 2012; Mongrain et al., 2011; Seligman et al., 2005; Sergeant & Mongrain, 2011; Shapira & Mongrain, 2010). While mechanisms of change were not investigated in this study, one likely explanation for the greater benefits to distressed users is that OPPIs may be increasing the experience of positive emotions and attitudes, leading to the experience improved psychological well-being. This conclusion fits with the person-activity fit theory, which posits that the active mechanism of effective OPPIs involves a combination of personal motivation to engage in effortful practice and the use of an activity that produces benefits greater than those of a placebo (Lyubomirsky et al., 2011). Thus, distressed individuals may have benefitted more due to greater motivation to change combined with the use of effective positive psychology activities.

Alternatively, distressed individuals may simply have more room to improve given their tendency to have more extreme baseline levels of depressive symptoms and dissatisfaction with life. Their distress status at baseline may have represented a transitory state that would have resolved on its own over time regardless of the use of an OPPI exercise. This explanation may be challenged, however, by the finding of greater short term improvements in depressive symptoms for individuals with a history of psychopathology. As a more stable indicator of a tendency towards clinical disorder than baseline level of distress, one would expect that the influence of history of psychopathology on well-being outcomes following OPPI use would not be attributable to spontaneous improvement. Together, the findings of greater improvement following OPPI use for both more distressed individuals and individuals having prior experience with psychological disorders corroborate the more general theory that OPPIs are most helpful for individuals with a tendency towards clinical disorder.

Study 2 also explored whether OPPI temporal orientation and history of psychotherapy played a moderating role on the effects of distress cluster on well-being over time. Temporal orientation was not a significant moderator of response to OPPIs based on distress cluster in either PH1 or PH2. Thus, the hypothesis that distressed individuals may experience greater benefits when using past-oriented OPPIs due to their tendency towards past-oriented thinking was not supported by the evidence. While there is some evidence that OPPI users in general benefit more when the activity matches their natural cognitive temporal bias (Schueller, 2010), the lack of differentiation based on distress cluster may suggest that distressed and non-distressed OPPI users do not have

distinguishably different cognitive temporal biases. Rather, both types of users may vary in their proclivity to favour past-, present-, or future-oriented thought. While additional research explicitly comparing cognitive temporal biases in distressed and non-distressed users is required to confirm this conclusion, the finding of no moderating effect on well-being outcomes provides additional information about one way in which distressed and non-distressed OPPI users may be similar. It may also be fruitful to explore whether cognitive temporal bias produces a good cluster solution fit for types of OPPI users as an alternative to the mood-based cluster solution explored in Study 1. Clustering by distress level and cognitive temporal bias could then be compared to determine which categorization predicts changes in well-being over time best following OPPI usage. Clinicians could utilize this information to help decide which user characteristics are most relevant for predicting OPPI efficacy.

Conversely, there was evidence for a moderating effect of history of psychotherapy on well-being outcomes for OPPI users by distress cluster. In PH1, only participants in the distressed cluster who had participated in psychotherapy in the past reported ongoing improved life satisfaction over the follow-up period. Participants in the distressed cluster with no history of psychotherapy and the non-distressed cluster as a whole reported no change in life satisfaction across the follow-up period. Coupled with the finding that the distressed cluster experienced greater life satisfaction following treatment completion regardless of past experience with psychotherapy, one may infer that experience with psychotherapy produced some unique response in the distressed cluster during the months following the 1-week exercise period. One possible response

may have been a greater propensity to continue using the OPPI due to a belief that, like the experience of psychotherapy, greater changes occur after a longer period of practice. These distressed cluster users may also have been particularly motivated to achieve additional improvements in well-being over the follow-up period given their poorer mood on average at baseline than their non-distressed cluster counterparts. This hypothesis could be tested in future research by asking participants to report on their use of the OPPIs after the end of the designated intervention period.

While depressive symptoms over time by distress cluster were not moderated by history of psychotherapy in PH1, the findings from PH2 indicated distressed cluster OPPI users experienced larger decreases in depressive symptoms following completion of the three week intervention period if they did *not* have prior experience with psychotherapy. While this seems contradictory to the findings for life satisfaction over the follow-up period in PH1, it highlights the importance of considering that the short- and long-term effects associated with OPPI use may differ. In this case, when the OPPIs were first learned and practised, having no experience with psychotherapy appeared to confer an advantage. This is particularly impressive given that these individuals had to learn an entirely new skill set, whereas those with prior experience in psychotherapy had likely been exposed to similar psychological techniques in the past. Furthermore, it is an indication that OPPIs are accessible to a population that is otherwise unlikely to seek out psychological services. The novelty of these exercises may have been the reason for this effect on depressive symptoms, in that participants in the distressed cluster without a history of psychotherapy may have responded more favourably due to the opportunity to

learn new psychological techniques that those with past experience in psychotherapy were already aware of.

Finally, Study 2 included sensitivity analyses to explore whether the same results would have emerged if there was no attrition over time. By re-running the multilevel models with estimated values for missing data, these analyses revealed a pattern of findings very similar to those based on observed data only. These results support the conclusion that the high attrition rates observed in PH1 and PH2 did not bias the findings for reports of psychological well-being over time. This is particularly important for conclusions drawn about the influence of distress cluster on outcome, as it was earlier revealed that the distressed cluster was at a greater risk of dropout in PH2. While the distressed cluster may have a more difficult time engaging with OPPIs practised over several weeks, the sensitivity analysis suggests these individuals are not at a disadvantage if they are able to overcome this difficulty.

Two exceptions were noted for cases where the sensitivity analyses produced different estimates than the observed data. Both were found in the models predicting SWLS scores in PH1. The first case indicated short-term changes in life satisfaction would have been smaller for distressed cluster OPPI users if there was no attrition. This may reflect the tendency for SWLS scores to remain stable over short time intervals (Pavot & Diener, 1993). The second case occurred for the long-term moderating effect of experience with psychotherapy would not have been found if all participants had remained in the study over the 6-month follow-up period. Still, past research indicates having a history of psychotherapy may reduce the risk of attrition (Sergeant & Mongrain,

2013). Thus, the subset of PH1 participants who dropped out prior to completion of the study may have been more likely to have no history of psychotherapy. The smaller effect estimate observed in the sensitivity analysis may therefore suggest that these dropouts would have reported improvements in life satisfaction comparable to their counterparts.

Study 2 included a large number of statistical tests, which raises concern about the possibility of Type I error accounting for some of the significant findings. Several mitigating factors suggest this issue is unlikely to have major consequences for the validity of the findings noted above. Tutzauer (2003) argues adjustments for Type I error due to a higher familywise error are only appropriate when the invalidation of any one particular test invalidates the theory being tested as a whole. This is not the case in Study 2, where each test provides information about whether distress level affects OPPI outcomes in different ways rather than confirming a general theory about a specific pattern of outcomes based on distress level. Additionally, since PH1 and PH2 included distinct sets of data, one could argue that the two studies represent different families of tests with independent familywise error rates. When considered individually, the number of tests conducted on each data set is notably smaller. Finally, even if the alpha level was adjusted to accommodate a higher familywise error rate, the majority of the present findings would still meet statistical significance. For example, using an alpha level adjustment to .01 for all multilevel model effects, 34 of the significant findings reported above would still be significant and 6 would no longer be significant. Thus, one may be more cautious drawing conclusions based on effects with *p*-values closer to .05, although

it may be overly presumptive to dismiss these findings altogether and conclude that no findings of outcome differences were legitimate.

5 General Discussion

The purpose of this investigation was to answer the question: Do OPPIs work equally well in distressed and non-distressed users? Evidence from previous OPPI studies was reviewed, leading to hypotheses that distress level is a reliable factor for classifying OPPI users and a significant predictor of differential responses to OPPIs. Findings from two large samples provided supporting evidence for both hypotheses. Thus, the answer to the question posed above appears to be no - distressed and non-distressed users respond differently to OPPIs. The predominant pattern appeared to favour individuals in the distressed cluster, who reported greater benefits to psychological well-being after completing OPPI exercises. There were two exceptions to this general conclusion, however. Compared to distressed cluster individuals, OPPI users in the non-distressed cluster experienced lower attrition levels and did not show the same proclivity towards smaller improvements in well-being when also having a history of psychological treatment.

These findings have important practical implications for both research and clinical activities. Future OPPI studies should account for participant distress level a factor that may influence outcomes. Studies that include distressed OPPI users are likely to find greater evidence of improvement over time than studies that include only non-distressed OPPI users. Additionally, it may be worthwhile to investigate ways to tailor OPPIs to the specific needs of both types of users. For example, distressed users may benefit more

from activities that are framed as useful for coping with high levels of negative affect (e.g. self-compassion, listening to uplifting music), whereas non-distressed users may benefit more from activities that are framed as useful for helping them become their best possible selves (e.g. optimism, gratitude). Distressed users may also require additional support to reduce their likelihood of dropout. While the participants in this study were not from a clinical sample, the finding that distressed individuals were still able to benefit from the activities suggests that OPPIs are not contra-indicated for clinical populations. Rather, OPPIs seem to be most impactful for those who are suffering. Given the cost-effectiveness associated with OPPIs, they merit consideration as a first line of defense against the development of psychological disorders in individuals who are experiencing distress. Furthermore, OPPIs could be explored as a potential adjunct to other forms of psychological treatment that would maximize the benefits obtained from seeking help.

While evidence suggests that distressed users benefit from OPPI use, equally important is the finding of minimal gains for non-distressed OPPI users. Based on this study, one might conclude that OPPIs may not enhance the experience of individuals who are not in distress. Another possible explanation may be that the outcome measures used in this study (depressive mood and life satisfaction) may not capture the way in which non-distressed individuals benefit. Indeed, other OPPI studies using participants similar to the non-distressed cluster in the present study have found significant improvements on measures of subjective happiness (Quiodbach, Wood, & Hansenne, 2009; Seligman et al., 2005), overall well-being (Mitchell et al., 2009), psychological capital (Luthans, Avey, & Patera, 2008), and body dissatisfaction (Geraghty, Wood, &

Hyland, 2010). Thus, the literature suggests OPPIs provide different kinds of benefits and whether distressed and non-distressed users profit in these domains is yet to be established. Future OPPI studies should ensure that outcome measures capture the full range of benefits that may be experienced by both types of users.

One interesting feature of the present study was that it tested the hypotheses in two independent samples with distinct methodologies and demographic characteristics. The first sample (PH1) included eight OPPIs that were practised daily for 1 week, with follow-up assessments 1, 3, and 6 months later. Participants were predominantly recruited through Facebook advertising, and were mostly female, White, and living in Canada. The second sample (PH2) included eight different OPPIs that were practised every other day for 3 weeks, with follow-up assessments 1 and 2 months later. Participants were predominantly recruited through Google advertising, and demonstrated greater variety than PH1 in terms of gender and ethnic background. Thus, the results from PH1 may have been more representative of a Caucasian Canadian female population's response to short-term use of OPPIs, whereas the results from PH2 may be more representative of a multicultural population's response to prolonged use of OPPIs. Of note, rates of baseline depression and past experience with psychopathology, psychotherapy, or psychopharmacological treatment were very similar across the two samples. This suggests that both groups were experiencing a moderate amount of psychological concerns, and individuals interested in these types of interventions have predictable characteristics.

The benefit to including findings from two independent samples is that more information can be gleaned about the generalizability of the results beyond demographic and methodological factors. For example, previous research suggests that individuals who subscribe to Western cultural values tend to respond more favourably to OPPIs than individuals who subscribe to collectivistic cultural values (Boehm, Lyubomirsky, & Sheldon, 2011). Presumably, this is because OPPIs emphasize self-improvement and personal agency as means of achieving happiness, which is consistent with Western values. If OPPI effectiveness was only found in PH1 (a Western culture sample), then this may be an indication that differences between distressed and non-distressed OPPI users is culturally driven. Given that this was not the case and improvements were evidenced in both the Western and multi-cultural sample in the current study, this online form of self-help appears to be profitable across cultural groups.

5.1 Limitations

The conclusions drawn about the influence of distress level on psychological well-being outcomes is limited by the particular operationalization of 'psychological well-being' in this study. Measures of depressive symptoms and satisfaction with life were used to represent the relative minimization of negative experiences and maximization of positive experiences that traditionally represent an individual with high psychological well-being (Diener, 1984). Others have questioned whether this conceptualization captures the essence of well-being, citing evidence that factors such as autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance as distinct dimensions of well-being that are also

important to consider (Ryff & Keyes, 1995). Additionally, life satisfaction is typically viewed as part of the cognitive component of well-being, and therefore does not directly measure positive affect. Given that increasing happiness is often a primary sign of treatment efficacy in previous OPPI studies (e.g. Mongrain et al., 2011; Schueller, 2010; Seligman et al., 2005; Shapira & Mongrain, 2010), it would have been informative to have results in the present study that would speak to changes in positive affect based on distress status. An important task for future research is to explore whether distressed individuals experience relatively greater improvements in other dimensions of well-being, or whether the benefits are limited to depressive symptoms and life satisfaction.

Another important factor to consider is the high attrition rates observed in PH1 and PH2. Generally speaking, when participants do not complete all phases of a study, the validity of the findings may be compromised. Online studies are notorious for high attrition rates, and it is essential to investigate and account for potential attrition effects to be confident in the validity of the findings. The present study investigated attrition in a variety of ways, and steps were taken to minimize the impact of attrition on the validity of the results. First, an exploration of attrition rates over time illustrated the key points of attrition across multiple assessments. The highest attrition rates occurred immediately following treatment completion rather than over the follow-up period. The intervention period was more labour-intensive than the follow-up period, so the greater effort involved in completing the post-test assessment may explain this pattern. This implies that attrition may have had a larger impact on results for treatment completion than on long-term outcomes. It also suggests that future OPPI studies should target the intervention period

rather than the follow-up period in the application of additional methods to minimize attrition.

At a more general level, the high attrition rates may potentially reflect a detrimental effect associated with OPPI use. It is possible that participants dropped out of the study early because the exercises actually made them feel worse. Mauss, Tamir, Anderson, and Savino (2011) suggested that positive psychology interventions may produce decreases in happiness. They argued that when the goal of becoming happier is made explicit, people tend to set unrealistic standards and as a result, are more likely to be disappointed with the amount of happiness that they do feel. In another study, Wood, Perunovic, and Lee (2009) found that repeating positive self-statements over a 4-minute period had a negative impact on the mood of participants with low self-esteem. In the realm of OPPI research, other studies have reported detrimental well-being effects for individuals with a needy personality style (Sergeant & Mongrain, 2011) and dysphoric individuals (Sin, Della Porta, & Lyubomirsky, 2011). Obtaining information from individuals who withdraw prematurely from OPPI studies about their reasons for dropout would be helpful for clarifying this issue further.

Attrition was addressed in the present study with survival analyses to determine whether distress cluster influenced attrition risk. In the Canadian sample who practised OPPIs for 1-week, distress cluster was not a significant factor, but in the international sample who practised OPPIs for 3 weeks, the distressed cluster was somewhat more likely to drop out over the course of the study. The latter finding had implications for the generalizability of subsequent modelling of well-being changes over time. With fewer

distressed OPPI users providing reports on their well-being over time, less information could be gleaned about the effects of these exercises for such individuals. To compensate for this lack of information, sensitivity analyses were included as a third method of addressing attrition. These analyses used observed data patterns and random error to impute estimated values for missing data with the goal of approximating the information non-completers would have provided if they had remained in the study. The consistency that emerged in the findings between models based on observed data and those based on imputed data stood as evidence that the high level of attrition did not produce systematic bias in the findings. While the imputation procedure still requires assumptions to be made about the nature of missing data (e.g. that non-completers would have responded similarly to completers matched on observed scores), it also reflects a step in the right direction towards compensating for attrition effects. Researchers are beginning to acknowledge the importance of conducting such sensitivity analyses in the presence of high attrition to provide additional evidence for the validity of results obtained (A. Parks, personal communication, October 30, 2012; Shapira & Mongrain, 2010).

5.2 Summary and concluding statements

The culmination of the present body of work is a deeper understanding of the heterogeneity of OPPI users. In Study 1, the work of Parks et al. (2012) was successfully replicated, finding that OPPI users can be categorized based on mood level at study entry. Some are "distressed", in that they experience low levels of positive affect and satisfaction, and significant depressive symptoms. Others are "non-distressed", in that they experience moderate levels of positive affect and satisfaction, and low levels of

depressive symptoms. In Study 2, several differences in response to OPPIs emerged based on this distinction by distress level. In the PH2 sample, attrition rates were slightly lower for non-distressed cluster OPPI users, whereas psychological well-being outcomes favoured distressed cluster OPPI users. There were also notable similarities between distressed and non-distressed cluster users in terms of attrition for the shorter-duration PH1 study and reports of psychological well-being over the follow-up period and when exercise temporal orientation was considered as a moderator variable. Thus, distressed and non-distressed OPPI users do share some similar experiences. Limitations such as the high attrition rate and specific operationalization of psychological well-being were also discussed. The findings from the present study may be extended by future research pursuits in areas such as potential cultural differences in the composition of OPPI user categories, targeting OPPIs to different types of users to improve the person-activity fit, and the ongoing investigation of why people drop out of OPPI studies and how to minimize the effects of attrition on data analysis.

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Table 1. Overview of OPPI studies from peer-reviewed journals, in chronological order.

Authorship	Intervention Design	Population	Level of Depression	Outcome	Attrition
Seligman, Steen, Park, & Peterson (2005)	1 week: • 3 good things • Gratitude visit • Using signature strengths • You at your best • Identifying strengths • Early memories (control)	Adult community sample	Mildly depressed	• ↑ happiness, ↓ depression in Using signature strengths, Gratitude • ↑ happiness in Gratitude visit • Small improvement in rest	29% (6 month)
Luthans, Avey, & Patera (2008)	1.5 weeks: • Resilience, efficacy, & optimism • Decision-making (control)	Adult workers	Non-distressed	• ↑ psychological capital (composite of resilience, efficacy, & hope) in Resilience, efficacy & optimism only	Not reported
Mitchell, Stanimirovic, Klein, & Vella-Brodrick (2009)	3 weeks: • Using signature strengths • Problem-solving • Reading about problem-solving (control)	Australian adult community sample	Non-distressed	• ↑ subjective well-being in Using signature strengths • no change in depression/anxiety symptoms, positive/negative affect	83% (3 month)
Quoidbach, Wood, & Hansenne (2009)	2 weeks: • Positive future thinking • Negative future thinking • Neutral future thinking • No treatment (control)	Adult university worker sample	Non-distressed	• ↑ happiness in Positive future thinking, no change in rest • no change in anxiety symptoms	50% (2 week)
Geraghty, Wood, & Hyland (2010)	2 weeks: • Gratitude diary • Monitoring/restructuring thoughts • Waitlist (control)	Adult community sample	Non-distressed	• ↓ body dissatisfaction in gratitude & monitoring conditions relative to control	62% (2 week)

(continued)

Authorship	Intervention Design	Population	Level of Depression	Outcome	Attrition
Schueller (2010)	1 week: • Blessings • Strengths • Active-constructive responding • Savoring • Life summary • Gratitude visit	Adult community sample	Not reported	• ↑ happiness, ↓ depression in Savoring, Blessings conditions • trend of ↑ happiness, ↓ depression across all other exercises	Not reported
Shapira & Mongrain (2010)	1 week: • Self-compassion • Optimism • Early memories (control)	Canadian adult community sample	Moderately depressed	• ↑ happiness, ↓ depression in Self-compassion & Optimism relative to control	80% (6 month)
Boehm, Lyubomirsky, & Sheldon (2011)	6 weeks: • Optimism • Gratitude • Activity list (control)	Anglo-American & Asian-American adult community sample	Not reported	• ↑ life satisfaction in Optimism & Gratitude	27% (1 month)
Lyubomirsky, Dickerhoof, Boehm, & Sheldon (2011)	2 months: • Optimism • Gratitude • Activity list (control)	Undergraduate students	Not reported	• no change in well-being overall • ↑ well-being in Optimism, Gratitude when self-selected participation	36% (6 month)
Mongrain, Chin, & Shapira (2011)	1 week: • Compassionate action • Early Memories (control)	Canadian adult community sample	Moderately depressed	• ↑ happiness & self-esteem, small ↓ depression in Compassionate action	75% (6 month)

(continued)

Authorship	Intervention Design	Population	Level of Depression	Outcome	Attrition
Sergeant & Mongrain (2011)	1 week: • Gratitude • Music-Listening • Early Memories (control)	Canadian adult community sample	Moderately depressed	• ↑ happiness in Gratitude & Music-Listening, ↓ physical symptoms severity in all conditions • no change in depression, self-esteem	63% (6 month)
Sin, Della Porta, & Lyubomirsky (2011)	4 weeks: • Gratitude letter • Listening to classical music (control)	Undergraduate students	Mildly depressed	• ↓ well-being in Gratitude Letter, ↑ well-being in Listening to Music @ post-test	Not reported
Mongrain & Anselmo-Mathews (2012)	1 week: • 3 good things • Using signature strengths • Early memories (control) • Positive early memories (control)	Canadian adult community sample	Moderately depressed	• ↑ happiness, ↓ depression in all groups • longer-lasting ↑ happiness in 3 good things, Using signature strengths	76% (6 month)
Parks, Della Porta, Pierce, Zilca, & Lyubomirsky (2012)	3-14 days: • Savouring • Happy memories • Acts of kindness • Strengthening social relationships • Pursuing goals • Gratitude journal • Expressing gratitude • Optimism	Community sample	Not reported	• ↑ mood and happiness overall • great improvements with more frequent use of exercises, use of a larger variety of activities	Not reported
Schueller & Parks (2012)	6 weeks: • Blessings • Strengths • Active-constructive responding • Savouring • Life summary • Gratitude visit • No treatment (control)	Adult community sample	Not reported	• ↓ depression in all conditions • greater ↓ in depression when using 2 or 4 different exercises; no difference between control & 6 different exercises	52% (6 week)

Table 2. Characteristics of Online Positive Psychology Interventions (OPPIs) in Project HOPE 1 (PH1) and Project HOPE 2 (PH2).

Data set	Condition	Description	Temporal orientation
PH1	3 Good Things	List 3 good things experienced over the past day	Past
	Positive Reinterpretation	Find something good about a bad situation	Past
	Self-Compassion	Cultivate a self-compassionate attitude	Present
	Gratitude	List things to be grateful for	Present
	Listening to Music	Listen to uplifting music	Present
	Signature Strengths	Identify personal strength and use it in everyday life	Future
	Compassionate Action	Act compassionately towards others	Future
	Letter from your Future Self	Imagining positive future, giving encouragement to current self	Future
PH2	Meditation/Reflecting on your Day	Alternating between meditation and reflection	Past
	Loving Kindness/Challenging Negative Thinking	Alternating between loving kindness and thought challenging	Past
	Meditation	Daily meditation	Present
	Loving Kindness	Cultivating self-compassion	Present
	Positivity	Cultivate positive experiences in a variety of ways	Present
	Curiosity	Cultivating curiosity/new learning experiences	Future
	Acts of Kindness	Performing acts of kindness towards others	Future
	Optimism	Cultivating optimism about future and self-efficacy	Future

Table 3. Descriptive statistics for baseline scores on outcome measures by cluster in Project HOPE 1 (PH1) and Project HOPE 2 (PH2) with comparative findings from Parks, Della Porta, Pierce, Zilca, and Lyubomirsky (2012).

			CES-D		SWLS		SHI		PANAS	
Data set	**Cluster**	***n***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
PH1	1	1453	29.73	12.45	14.82	6.13	2.15	0.47	1.49	0.72
	2	931	9.28	7.41	26.08	5.24	3.26	0.50	3.95	1.44
	1	**1296**	**30.12**	**11.83**	**14.25**	**5.96**	**2.08**	**0.44**	**1.37**	**0.62**
	2	**1088**	**8.55**	**8.14**	**25.14**	**5.75**	**3.19**	**0.52**	**3.74**	**1.46**
PH2	1	508	39.35	7.16	10.35	3.96				
	2	1003	9.35	5.30	26.66	4.09				
	3	509	31.13	7.15	24.91	3.93				
	4	709	19.32	6.49	14.88	3.99				
	1	**1410**	**31.13**	**10.08**	**15.22**	**6.50**				
	2	**1319**	**11.39**	**6.84**	**25.60**	**5.04**				
Parks et al. (2012)	1	451	26.74	10.58	14.36	5.69	2.32[a]	0.47	1.41	0.71
	2	461	7.93	5.85	26.89	4.83	2.87[a]	0.71	2.91	0.85

Note. Data in bold represents cluster analyses using a square-root transformation of the CES-D variable. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener et al., 1985). SHI = Steen Happiness Index (Seligman et al., 2005). PANAS = Positive and Negative Affect Schedule (Watson et al., 1988).

[a]Parks et al. (2012) utilized a scale ranging from -1 to +3, whereas the scale used in PH1 and PH2 ranged from +1 to +5. To facilitate the comparison of scores with the present data set, 2 points were added to the mean scores reported by Parks et al. (2012)

Table 4. Attrition rates over time in Project Hope 1 (PH1) and Project Hope 2 (PH2).

PH1			
Assessment Time	**Sample Size**	**Number of dropouts**	**Rate of attrition (% of original sample)**
Began baseline	4628	n/a	n/a
Completed baseline	3659	969	20.9%
1 week post-test	2380	1279	27.5%
1 month follow-up	1975	405	8.8%
3 month follow-up	1440	535	11.6%
6 month follow-up	940	500	10.8%
PH2			
Assessment Time	**Sample Size**	**Number of dropouts**	**Rate of attrition (% of original sample)**
Began baseline	3432	n/a	n/a
Completed baseline	2737	695	20.3%
3 week post-test	1233	1504	43.8%
1 month follow-up	1022	211	6.1%
2 month follow-up	679	343	10%

Table 5. Descriptive statistics – Mean (Standard Deviation) for CES-D and SWLS scores across time.

PH1						
Measure	**Sample**	**Baseline**	**1 week**	**1 month follow-up**	**3 month follow-up**	**6 month follow-up**
CES-D	Total (n = 1898)	21.56 (14.70)	18.45 (12.56)	18.63 (12.40)	17.49 (12.53)	17.12 (14.06)
	Distressed (n = 1014)	31.39 (11.90)	25.30 (11.78)	24.75 (11.95)	23.15 (12.55)	23.57 (14.15)
	Non-Distressed (n = 884)	10.28 (7.96)	10.85 (8.31)	12.23 (9.23)	12.09 (9.85)	11.10 (11.00)
SWLS	Total (n = 1898)	19.38 (7.95)	20.88 (7.95)	21.37 (7.82)	22.23 (7.79)	21.85 (8.69)
	Distressed (n = 1014)	14.31 (5.87)	16.48 (6.85)	17.12 (6.95)	18.26 (7.20)	17.59 (8.17)
	Non-Distressed (n = 884)	25.19 (5.75)	25.81 (5.96)	25.80 (6.01)	25.93 (6.38)	25.96 (7.02)
PH2						
Measure	**Sample**	**Baseline**	**3 weeks**	**1 month follow-up**	**2 month follow-up**	
CES-D	Total (n = 1802)	21.66 (13.17)	16.13 (11.78)	16.84 (12.04)	16.91 (12.53)	
	Distressed (n = 942)	31.12 (10.09)	23.32 (11.69)	23.11 (12.61)	23.77 (12.74)	
	Non-Distressed (n = 860)	11.31 (6.85)	10.07 (7.78)	11.27 (8.17)	10.96 (8.75)	
SWLS	Total (n = 1802)	20.20 (7.91)	21.79 (7.80)	21.58 (7.84)	22.04 (7.84)	
	Distressed (n = 942)	15.23 (6.61)	16.68 (6.81)	16.74 (7.21)	17.21 (7.11)	
	Non-Distressed (n = 860)	25.67 (5.12)	26.06 (5.75)	25.84 (5.59)	26.24 (5.76)	

Note. Total = All participants in sample; Distressed = Participants in distressed cluster; Non-Distressed = Participants in non-distressed cluster. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

Table 6. Multilevel model results for Time*Cluster in Project Hope 1 (PH1) and Project Hope 2 (PH2).

PH1						
Measure	**Effect**	**Estimate**	***t*-value**	**df**	***p*-value**	**Cohen's f^2**
CES-D	Intercept	10.39	29.39	1896	<.001	
	STE	0.64	1.31	2566	.190	0.049
	LTE	0.44	1.65	2566	.100	0.003
	Cluster	20.82	42.99	1896	<.001	0.485
	STE*Cluster	-6.38	-9.46	2566	<.001	0.027
	LTE*Cluster	-1.17	-3.12	2566	.002	0.003
SWLS	Intercept	25.18	122.04	1896	<.001	
	STE	0.69	2.98	2541	.003	0.026
	LTE	-0.03	-0.25	2541	.800	0.009
	Cluster	-10.70	-37.86	1896	<.001	0.242
	STE*Cluster	1.11	3.48	2541	<.001	0.003
	LTE*Cluster	0.72	3.73	2541	<.001	0.005
PH2						
Measure	**Effect**	**Estimate**	***t*-value**	**df**	***p*-value**	**Cohen's f^2**
CES-D	Intercept	11.76	29.25	1800	<.001	
	STE	-1.02	-1.60	1708	.110	0.063
	LTE	0.61	1.77	1708	.076	0.002
	Cluster	19.47	34.03	1800	<.001	0.853
	STE*Cluster	-7.03	-7.50	1708	<.001	0.027
	LTE*Cluster	-0.46	-0.90	1708	.366	<0.001
SWLS	Intercept	25.55	107.56	1800	<.001	
	STE	0.56	1.90	1695	.058	0.037
	LTE	-0.15	-0.90	1695	.369	0.002
	Cluster	-10.09	-30.13	1800	<.001	0.333
	STE*Cluster	1.44	3.33	1695	<.001	0.009
	LTE*Cluster	0.46	1.85	1695	.064	0.002

Note. Significant effects shaded grey. STE = Short-Term Effect. LTE = Long-Term Effect. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

Table 7. Post hoc pairwise comparisons following significant LTE*Cluster effects in Project Hope 1 (PH1).

Measure	Cluster	Comparison	Estimate	*t*-value	df	*p*-value[a]
CES-D	Distressed	1 week v. 1 month	0.51	0.92	2562	.984
		1 week v. 3 months	2.16	3.24	2562	.027
		1 week v. 6 months	1.49	1.61	2562	.744
		1 month v. 3 months	1.65	2.43	2562	.230
		1 month v. 6 months	0.98	1.06	2562	.964
		3 months v. 6 months	-0.67	-0.74	2562	.996
	Non-Distressed	1 week v. 1 month	-1.36	-2.39	2562	.245
		1 week v. 3 months	-1.18	-1.78	2562	.636
		1 week v. 6 months	-0.88	-0.98	2562	.978
		1 month v. 3 months	0.18	0.27	2562	.999
		1 month v. 6 months	0.48	0.53	2562	.999
		3 months v. 6 months	0.30	0.34	2562	.999
SWLS	Distressed	1 week v. 1 month	-0.63	-2.50	2537	.200
		1 week v. 3 months	-1.75	-5.41	2537	<.001
		1 week v. 6 months	-1.56	-3.20	2537	.030
		1 month v. 3 months	-1.12	-3.45	2537	.013
		1 month v. 6 months	-0.93	-1.94	2537	.525
		3 months v. 6 months	0.19	0.43	2537	.999
	Non-Distressed	1 week v. 1 month	-0.04	-0.14	2537	.999
		1 week v. 3 months	0.01	0.02	2537	.999
		1 week v. 6 months	0.22	0.46	2537	.999
		1 month v. 3 months	0.04	0.13	2537	.999
		1 month v. 6 months	0.26	0.55	2537	.999
		3 months v. 6 months	0.22	0.51	2537	.999

Note. Significant effects shaded grey. LTE = Long-Term Effect. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).
[a]Tukey adjustment included.

Table 8. Descriptive statistics - Mean (Standard Deviation) for CES-D and SWLS scores across Time and History of Psychopathology.

PH1

Measure	History of Psychopathology	Baseline	1 week	1 month follow-up	3 month follow-up	6 month follow-up
CES-D	Yes (n =1514)	23.43 (14.78)	19.67 (12.64)	19.46 (12.46)	18.14 (12.74)	18.16 (14.27)
	No (n = 384)	14.19 (11.77)	12.49 (10.25)	14.60 (11.27)	14.27 (10.92)	11.50 (11.40)
SWLS	Yes (n = 1515)	18.61 (7.84)	20.25 (7.99)	20.78 (7.87)	21.91 (7.86)	21.42 (8.84)
	No (n = 384)	22.45 (7.68)	23.98 (6.97)	24.22 (6.95)	23.82 (7.30)	25.96 (7.02)

PH2

Measure	History of Psychopathology	Baseline	3 weeks	1 month follow-up	2 month follow-up
CES-D	Yes (n = 1260)	23.43 (13.28)	17.19 (12.10)	17.62 (12.31)	18.41 (13.05)
	No (n = 542)	17.56 (11.95)	13.81 (10.71)	14.98 (11.18)	13.48 (10.52)
SWLS	Yes (n = 1264)	19.26 (7.84)	21.02 (7.75)	20.71 (7.86)	21.06 (7.89)
	No (n = 542)	22.39 (7.63)	23.47 (7.67)	23.62 (7.43)	24.29 (7.25)

Note. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

Table 9. Multilevel model results for Time*History of Psychopathology (HPath) in Project Hope 1 (PH1) and Project Hope 2 (PH2).

PH1						
Measure	**Effect**	**Estimate**	***t*-value**	**df**	***p*-value**	**Cohen's f^2**
CES-D	Intercept	14.25	20.54	1896	<.001	
	STE	-1.16	-1.33	2566	.183	0.024
	LTE	0.42	0.88	2566	.378	0.001
	HPath	9.09	11.72	1896	<.001	0.021
	STE*HPath	-2.05	-2.15	2566	.032	0.001
	LTE*HPath	-0.77	-1.49	2566	.136	0.001
SWLS	Intercept	22.44	56.10	1897	<.001	
	STE	1.54	3.88	2541	<.001	0.023
	LTE	-0.03	-0.10	2541	.917	0.006
	HPath	-3.73	8.33	1897	<.001	0.007
	STE*HPath	-0.30	-0.69	2541	.493	<0.001
	LTE*HPath	-0.46	1.76	2541	.079	0.001
PH2						
Measure	**Effect**	**Estimate**	***t*-value**	**df**	***p*-value**	**Cohen's f^2**
CES-D	Intercept	17.52	27.91	1801	<.001	
	STE	-1.97	-2.23	1708	.026	0.048
	LTE	-0.04	-0.09	1708	.926	<0.001
	HPath	6.20	8.25	1801	<.001	0.022
	STE*HPath	-3.59	-3.36	1708	<.001	0.007
	LTE*HPath	0.43	0.75	1708	.455	<0.001
SWLS	Intercept	22.51	62.14	1805	<.001	
	STE	1.04	2.66	1695	.008	0.032
	LTE	0.16	0.69	1695	.489	<0.001
	HPath	-3.22	-7.44	1805	<.001	0.007
	STE*HPath	0.49	1.04	1695	.300	0.001
	LTE*HPath	-0.12	-0.43	1695	.664	<0.001

Note. Significant effects shaded grey. STE = Short-Term Effect. LTE = Long-Term Effect. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

Table 10. Project Hope 1 (PH1) Multilevel model results for Time*Cluster*Temporal Orientation (TO).

Measure	Effect	Estimate	*t*-value	df	*p*-value	Cohen's f^2
CES-D	Intercept	9.86	13.34	1895	<.001	
	STE	2.87	2.22	2562	.027	0.051
	LTE	0.00	0.00	2562	.999	0.003
	Cluster	20.82	42.99	1895	<.001	0.486
	TO	0.25	0.82	1895	.413	0.001
	STE*Cluster	-8.17	-4.79	2562	<.001	0.028
	LTE*Cluster	-0.70	-0.66	2562	.507	0.003
	STE*TO	-1.08	-1.85	2562	.064	0.001
	LTE*TO	0.21	0.63	2562	.529	<0.001
	STE*Cluster*TO	0.87	1.15	2562	.251	<0.001
	LTE*Cluster*TO	-0.23	-0.47	2562	.635	<0.001
SWLS	Intercept	25.69	59.56	1895	<.001	
	STE	0.83	1.31	2537	.190	0.028
	LTE	0.07	0.17	2537	.864	0.009
	Cluster	-10.70	-37.86	1895	<.001	0.243
	TO	-0.24	-1.35	1895	.177	0.001
	STE*Cluster	0.33	0.38	2537	.702	0.004
	LTE*Cluster	0.47	0.86	2537	.388	0.005
	STE*TO	-0.07	-0.25	2537	.804	<0.001
	LTE*TO	-0.05	-0.28	2537	.776	<0.001
	STE*Cluster*TO	0.38	0.98	2537	.330	<0.001
	LTE*Cluster*TO	0.12	0.49	2537	.622	<0.001

Note. Significant effects shaded grey. STE = Short-Term Effect. LTE = Long-Term Effect. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

Table 11. Project Hope 2 (PH2) multilevel model results for Time*Cluster*Temporal Orientation (TO).

Measure	Effect	Estimate	*t*-value	df	*p*-value	Cohen's f^2
CES-D	Intercept	10.45	11.86	1799	<.001	
	STE	1.02	0.61	1704	.541	0.066
	LTE	-0.01	-0.01	1704	.989	0.002
	Cluster	19.42	33.97	1799	<.001	0.852
	TO	0.63	1.68	1799	.092	0.005
	STE*Cluster	-4.26	-2.03	1704	.043	0.027
	LTE*Cluster	-0.46	-0.40	1704	.689	0.001
	STE*TO	-0.97	-1.33	1704	.184	0.003
	LTE*TO	0.29	0.73	1704	.465	<0.001
	STE*Cluster*TO	-1.24	-1.43	1704	.153	0.001
	LTE*Cluster*TO	-0.01	-0.02	1704	.987	<0.001
SWLS	Intercept	25.79	50.26	1799	<.001	
	STE	0.12	0.15	1691	.881	0.038
	LTE	-0.13	-0.27	1691	.783	0.003
	Cluster	-10.08	-30.06	1799	<.001	0.332
	TO	-0.11	-0.52	1799	.601	0.001
	STE*Cluster	1.02	0.90	1691	.367	0.009
	LTE*Cluster	0.88	1.37	1691	.170	0.003
	STE*TO	0.21	0.58	1691	.565	0.001
	LTE*TO	-0.01	-0.05	1691	.960	<0.001
	STE*Cluster*TO	0.19	0.39	1691	.695	<0.001
	LTE*Cluster*TO	-0.20	-0.71	1691	.478	<0.001

Note. Significant effects shaded grey. STE = Short-Term Effect. LTE = Long-Term Effect. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

Table 12. Project Hope 1 (PH1) multilevel model results for Time*Cluster*History of Psychotherapy (HT).

Measure	Effect	Estimate	*t*-value	df	*p*-value	Cohen's f^2
CES-D	Intercept	8.81	21.25	1876	<.001	
	STE	0.81	1.23	2533	.221	0.051
	LTE	0.31	0.82	2533	.413	0.003
	Cluster	20.32	41.78	1876	<.001	0.467
	HT	3.49	7.18	1876	<.001	0.014
	STE*Cluster	-6.56	-6.76	2533	<.001	0.026
	LTE*Cluster	-0.66	-1.10	2533	.272	0.003
	STE*HT	-0.61	-0.67	2533	.504	<0.001
	LTE*HT	0.24	0.46	2533	.648	<0.001
	STE*Cluster*HT	0.41	0.35	2533	.729	<0.001
	LTE*Cluster*HT	-0.79	-1/03	2533	.305	<0.001
SWLS	Intercept	25.75	105.65	1876	<.001	
	STE	0.63	1.95	2509	.051	0.026
	LTE	0.09	0.47	2509	.639	0.010
	Cluster	-10.51	-36.77	1876	<.001	0.229
	HT	-1.25	-4.38	1876	<.001	0.009
	STE*Cluster	1.41	2.96	2509	.003	0.003
	LTE*Cluster	0.14	0.44	2509	.656	0.006
	STE*HT	0.16	0.37	2509	.715	<0.001
	LTE*HT	-0.26	-0.96	2509	.338	0.002
	STE*Cluster*HT	-0.50	-0.83	2509	.409	<0.001
	LTE*Cluster*HT	0.93	2.35	2509	.019	0.001

Note. Significant effects shaded grey. STE = Short-Term Effect. LTE = Long-Term Effect. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

Table 13. Project Hope 2 (PH2) multilevel model results for Time*Cluster*History of Psychotherapy (HT).

Measure	Effect	Estimate	*t*-value	df	*p*-value	Cohen's f^2
CES-D	Intercept	11.62	25.90	1771	<.001	
	STE	-0.82	-1.10	1682	.272	0.064
	LTE	0.50	1.22	1682	.223	0.002
	Cluster	19.34	33.43	1771	<.001	0.835
	HT	0.45	0.76	1771	.447	0.009
	STE*Cluster	-8.09	-7.40	1682	<.001	0.028
	LTE*Cluster	-0.12	-0.19	1682	.848	0.001
	STE*HT	-0.76	-0.65	1682	.514	0.001
	LTE*HT	0.30	0.48	1682	.631	<0.001
	STE*Cluster*HT	2.71	2.01	1682	.045	0.001
	LTE*Cluster*HT	-0.82	-1.08	1682	.282	<0.001
SWLS	Intercept	25.97	99.10	1771	<.001	
	STE	0.41	1.17	1670	.242	0.039
	LTE	-0.15	-0.75	1670	.456	0.002
	Cluster	-10.01	-29.71	1771	<.001	0.342
	HT	-1.37	-3.96	1661	<.001	0.013
	STE*Cluster	1.99	3.73	1670	<.001	0.009
	LTE*Cluster	0.36	1.17	1670	.242	0.002
	STE*HT	0.60	1.06	1670	.291	<0.001
	LTE*HT	-0.04	-0.13	1670	.894	<0.001
	STE*Cluster*HT	-1.35	-1.82	1670	.069	<0.001
	LTE*Cluster*HT	0.26	0.69	1670	.489	<0.001

Note. Significant effects shaded grey. STE = Short-Term Effect. LTE = Long-Term Effect. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

Table 14. Comparison of original and imputed effect estimates in Project Hope 1 (PH1) and Project Hope 2 (PH2).

PH1				
Measure	**Effect**	**Original Estimate**	**Imputed Estimate**	**95% Confidence Interval**
CES-D	STE*Cluster	**-6.38**	**-7.49**	-9.01, -5.96
	LTE*Cluster	**-1.17**	**-1.49**	-2.29, -0.70
	STE*Cluster*TO	0.87	0.22	-1.06, 1.49
	LTE*Cluster*TO	-0.23	-0.13	-0.93, 0.66
	STE*Cluster*HP	0.41	0.16	-1.80, 2.11
	LTE*Cluster*HP	-0.79	-0.40	-1.47, 0.68
SWLS	STE*Cluster	**1.11**	**1.98**	1.18, 2.79
	LTE*Cluster	**0.72**	**0.97**	0.45, 1.49
	STE*Cluster*TO	0.38	0.21	-0.44, 0.86
	LTE*Cluster*TO	0.12	0.06	-0.22, 0.34
	STE*Cluster*HP	-0.50	-0.25	-1.25, -0.75
	LTE*Cluster*HP	**0.93**	0.26	-0.24, 0.76
PH2				
Measure	**Effect**	**Original Estimate**	**Imputed Estimate**	**95% Confidence Interval**
CES-D	STE*Cluster	**-7.03**	**-8.03**	-9.79, -6.27
	LTE*Cluster	-0.46	-0.48	-1.55, 0.58
	STE*Cluster*TO	-1.24	-0.05	-1.51, 1.41
	LTE*Cluster*TO	-0.01	-0.02	-0.72, 0.68
	STE*Cluster*HP	**2.71**	1.91	-0.50, 4.32
	LTE*Cluster*HP	-0.82	-0.60	-1.95, 0.75
SWLS	STE*Cluster	**1.44**	**2.03**	1.08, 2.99
	LTE*Cluster	0.56	**0.59**	0.09, 0.89
	STE*Cluster*TO	0.19	0.04	-0.60, 0.69
	LTE*Cluster*TO	-0.20	-0.06	-0.41, 0.29
	STE*Cluster*HP	-1.35	-0.54	-1.62, 0.54
	LTE*Cluster*HP	0.30	-0.04	-0.69, 0.62

Note. Estimates in **bold** have a p-value < .05. TO = Temporal Orientation. HT = History of Psychotherapy. STE = Short-Term Effect. LTE = Long-Term Effect. CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977). SWLS = Satisfaction with Life Scale (Diener at al., 1985).

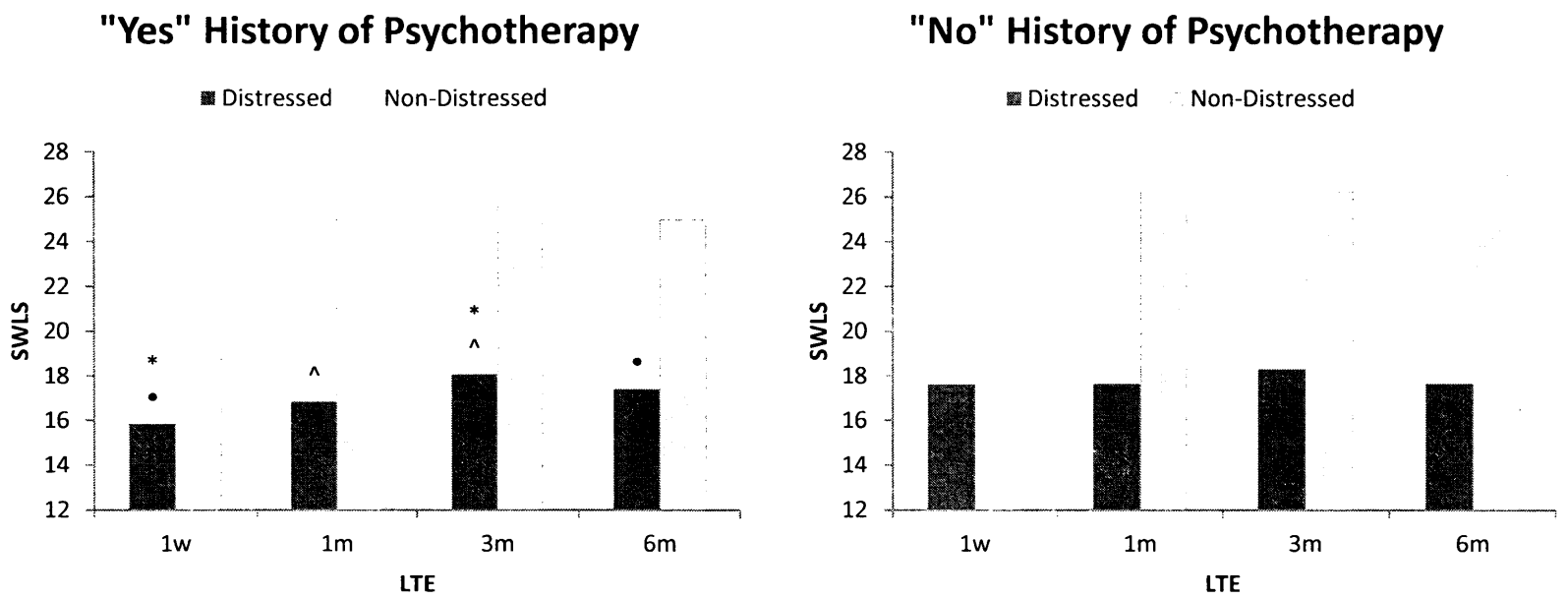

Figure 1. Comparison of life satisfaction over the follow-up period in Project Hope 1 (PH1). SWLS = Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985); LTE = Long-Term Effect. Pairwise comparisons revealed significant changes in life satisfaction for participants in the distressed cluster with a history of psychotherapy between 1 week and 3 months post-test (*; $p < .001$), 1 week and 6 months post-test (•; $p = .026$), and 1 month and 6 months post-test (^; $p = .038$). Thus, participants in the distressed cluster with past experience in psychotherapy reported unique increases in life satisfaction over the follow-up period.

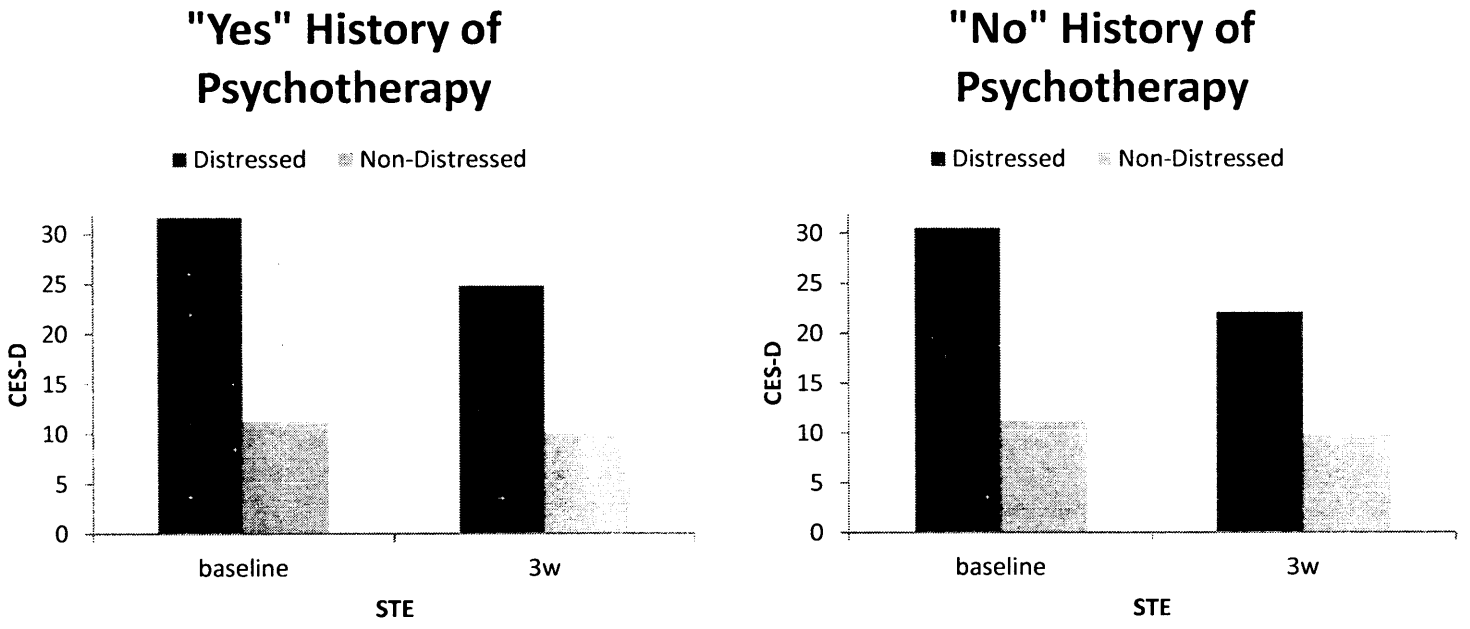

Figure 2. Comparison of depressive symptoms before and after exercise completion in Project Hope 2 (PH2). CES-D = Centre for Epidemiological Studies-Depression scale (Radloff, 1977); STE = Short-Term Effect. Participants in the distressed cluster with no history of psychotherapy reported a greater reduction in depressive symptoms at post-test than their counterparts with a history of psychotherapy. Participants in the non-distressed cluster reported no notable change in depressive symptoms.

Appendix A: Project Hope 1 Exercise Descriptions

3 Good Things

We think too much about what goes wrong and not enough about what goes right in our lives. Of course, sometimes it makes sense for us to analyse bad events so that we can learn from them and avoid them in the future. However, people tend to spend more time thinking about what is bad in life than is helpful. Worse, this tendency to focus on bad events sets us up for anxiety and depression. One way to keep this from happening is to develop our ability to think about the good in life. Most of us are not nearly as good at analyzing good events as we are at analyzing bad events, so this is a skill that needs practice. As you become better at focusing on the good in your life, you will likely become more grateful for what you have and more hopeful about the future. So let's get started.

Your assignment is as follows:

Every night for one week, set aside 10 minutes before you go to bed. Use that time to write down three things that went really well on that day and why they went well. Log on to the website and use the space provided to write about the events. This is vital because it is important that you have a physical record of what you wrote. It is not enough to do this exercise in your head. The three things you list can be relatively small in importance ("My husband picked up my favourite ice cream for dessert on the way home from work today") or relatively large in importance ("My sister just gave birth to a healthy baby boy"). Next to each positive event in your list, answer the question, "Why did this good thing happen?" For example, someone might write that her husband picked up ice cream "because my husband is really thoughtful sometimes" or "because I remembered to call him from work to remind him to stop by the grocery store." When asked why her sister gave birth to a healthy baby boy, someone might write that "God was looking out for her" or "She did everything right during her pregnancy."

Positive Reinterpretation

Often, everyday hassles cause tremendous stress. Previous research suggests that one way to increase well-being is to reframe these negative events in positive terms. Trying to find the silver lining in problems and viewing them as opportunities for growth and development may have many positive benefits.

This exercise will ask you to briefly describe the most bothersome event in your day. You will then be asked to answer 4 questions that will help you to reinterpret the event in more positive terms. Positive thinking is a strength of character that takes practice in order to develop, so we ask you to think of these exercises as helping you to build a new strength that you can use all the time. The benefits of this work may not be immediate, but like exercising to 'get in shape,' the advantages emerge over time with continued practice so try to stick with it for 1 week.

Below is an example of how one might complete this exercise.

Briefly describe the most bothersome event that occurred today.

I got into an argument with my roommate after she told me to wash my dishes. She made me feel like a slob who never picks up after herself. It's like I'm living back at home with my mother. I hate being told what to do.

1) How can I grow from this experience?

I guess living with her will help me to learn how to live with others, to get along with people who are different from me. This might help in the future career-wise and otherwise.

2) How can I see this event in a different, more positive light?

She wasn't trying to be mean or demanding. She's just a neat-freak, as she admitted herself. It must have been unpleasant for her as well. She is a really good friend and she's not really asking for much. I guess I'm glad she came to me.

3) Is there something good in what happened?

At least now she got it off her chest and I know how she feels. I can help clean up a bit more. It's not fun. But I guess it's the right thing to do anyway. I should learn to kick my messiness habit, and now is as good a time as any.

4) What can I learn from this experience?

I can learn to be more conscientious about housework. I'm learning to compromise and get along with people with different needs from my own. I'm learning more about my roommate.

Self-Compassion

This exercise involves learning how to feel greater compassion towards yourself. This ability has been associated with many mental health benefits, with recent research showing that being compassionate to yourself when you are stressed or upset may reduce problems like anxiety and depression. The goal of this exercise is to help you **refocus your thoughts and feelings on being accepting, supportive, and caring for yourself**. Having compassion for yourself is a strength of character that takes practice in order to develop, so we ask you to think of this exercise as helping you to build a new strength that you can use all the time, both in your daily life as well as when you feel distressed. The benefits of this work may not be immediate, but like exercising to 'get in shape,' the advantages can emerge over time with continued practice. So try to stick with it over the next week.

We ask that you think about an event or situation that occurred today that was distressing, or left you feeling upset. Now, we'd like you to write a one paragraph letter to yourself about this distressing event or situation. You should write this letter to yourself from a caring perspective, providing compassion to yourself in regards to your emotional distress. Before you begin your first letter, please read the sample daily letter provided. On days 2-7, you can refresh your memory by reading the example provided, or immediately begin your letter.

Today's Event: *Failing my Science Exam*

My Dear Friend,

I am sorry to hear that you had an upsetting day today. I know you are unhappy that when you got back your exam today, you found out that you failed. I understand why you feel distressed about this and I would feel the same if I was in your position. I know how hard you studied for that exam and you have every right to be upset.

It's not your fault that you did not do as well as you had hoped, it was a very hard exam. You tried the best you could and that's something to be proud of. Sometimes these things happen, it does not mean you are stupid or inferior, or any less of a person. Failing one exam doesn't mean that you are a failure, or that you will to continue to do poorly in school. What would you say to a friend who was going through the same experience? Probably that no one in the world is perfect and that everyone writes a bad exam at one time or another.

People will not judge you and will still like you if they were to find out you didn't do as well as you had anticipated. People who truly love and support you will not care about how well you do in school, and will instead focus on your wonderful personality qualities. I still think you are an intelligent, caring person with a really good sense of humour! You deserve to forgive yourself there is so much in your life to be happy about!

To start writing your own letter, try to feel that part of you that can be kind and understanding of others. Think about what you would say to a friend in your position, or what a friend would say to you in this situation. Try to have understanding for your distress (e.g. I am sad you feel distressed…) and realize your distress makes sense. Try and be good to yourself. We would like you to write whatever comes to you, but make sure this letter provides you with what you think you need to hear in order to feel nurtured and soothed about your stressful situation or event. This letter may take about 5-15 minutes to write, and there is no "right" or "wrong" way of doing it.

Gratitude

This exercise involves harnessing feelings of thankfulness for big or small things in your life. It intends to make you feel more grateful for your life circumstances, which has been associated with many mental health benefits. Being grateful is a strength of character that takes practice in order to develop, so we ask you to think of this exercise as helping you to build a new strength that you can use all the time, both in your daily life as well as when you feel distressed. The benefits of this work may not be immediate, but like exercising to 'get in shape,' the advantages emerge over time with continued practice. So try to stick with it for this week.

For example, you may be grateful today for:

1) My inner-strength
2) Reading a good book
3) For meeting new and interesting people at school
4) For my dad for surprising me and taking me out for dinner
5) For my ipod
6) For my friend's understanding
7) For a nice hot shower after a long day
8) Having a good laugh with my mom
9) Learning new things from my teachers/professors

Now, in the space provided below, please list 5 things (or gifts) that you are grateful or thankful for today. These can be things that are stable in your life, or something new that occurred to you. If you feel it is appropriate, you can list some of the things you are grateful/thankful for that you listed in previous entries, but we encourage you to try and think of new things daily.

Listening to Music

This exercise involves selecting and listening to music that you find uplifting and that makes you feel good. Listening to music can help you express yourself emotionally and self-reflect. It is being used more and more as a form of therapy and is believed to increase one's positive emotions and level of happiness. In short, research has suggested that listening to music that is positive and pleasurable to you may have many benefits, including greater psychological well-being.

Choose and listen to 3 or 4 songs that you find uplifting. These can be favourite songs that 'make you feel good,' and you can listen to the same song more than once. You can engage in this exercise anywhere; however, we ask that you remain focused on the music. Set aside 10 minutes before bed and log on to this website where we will ask you the following brief questions about your experience:

1) What is the artist's name and the title of the songs you listened to today, if known?

2) How long did you listen to the music for?
    a. Less than 5 minutes
    b. 5-10 minutes
    c. 10-15 minutes
    d. 15 minutes or more

3) What were your feelings while listening to the music?

Signature Strengths

Honesty. Loyalty. Perserverance. Creativity. Kindness. Wisdom. Courage. Fairness. These and about 16 other character strengths are valued in almost every culture in the world. We believe that people can get more satisfaction out of life if they learn to identify which of these character strengths they possess in abundance and then use them as much as possible whether working, loving, or playing.

Here are the specific steps to follow:

1) You will take a questionnaire (*VIA Signature Strength Questionnaire,* www.authentichappiness.com) that gives you feedback about your strengths. This will take about 45 minutes.
2) Every day for the next seven days use one of your top five strengths in a way that you have not before. You might use your strength in a new setting or with a new person. It's your choice. At the end of each day log on to the website to write about how you used your strength that day. Here are some examples of how people have used their strengths in new ways:
    a. One of Tracy's signature strengths is love of learning. She chose to spend some time browsing the internet for information about how to brew beer at home, something she had always wanted to try.
    b. One of Russell's signature strengths is fairness. He decided to exercise this strength by devising a system that he and his roommates could use to split up household chores so that everyone contributed equally.
    c. Judy's top strength is an appreciation of beauty and excellence. She decided to take a walk during her lunch hour so that she could enjoy the brilliantly coloured Fall leaves.
    d. Kent's signature strength is playfulness/humour. He chose to sneak into the bathroom at work and post some funny comic strips on the stall walls.

Each day, please answer the following questions:

1) Which strength did you use today?

2) How did you use this strength in a new way today?

Compassionate Action

This exercise involves helping or supporting others for brief periods of time over the next week. It is believed that when we help and care for others, benefits are provided not only to the person being helped, but to ourselves as well. Some have even argued that the more we can love and appreciate others, the more positive energy comes back to us. That is why caring for and helping others may be the best possible thing we can do for ourselves.

We would like you to act compassionately towards someone for 5 to 15 minutes each day. That is, we'd like you to help or interact with someone in a supportive and considerate way. In the evening, set aside 10 minutes before bed and log on to this website where you will report about this experience. You will be asked to complete this assignment on a daily basis for seven days.

Examples of Compassionate Action include:

- Providing assistance to an acquaintance
- Helping a roommate/neighbour
- Talking to a homeless person
- Making small talk with someone having a hard day
- Calling a friend who is having a hard time
- Simply being more loving to those around you

How did you try to help or interact with someone in a supportive and considerate way? In your response, please answer the following:

1) Describe your compassionate action.
2) Who was the person(s) you were interacting with?
3) Where did this occur?
4) How long did this interaction last and how did it make you feel?

Letter from your Future Self

To accomplish great things we must not only act but also dream, not only plan but also believe." Anatole France

We sometimes think too much about what goes wrong and not enough about possibilities for a better future. Of course, sometimes it makes sense for us to analyse bad events in order to prevent them from occurring again, but to project them into the future can also create self-fulfilling prophecies. One way to keep this from happening is to develop our ability to have a positive vision for our future. To think about appealing possibilities is the first step in making positive changes in our lives. As you become better at focusing on a positive future, you will likely become more optimistic and motivated to take small steps in that direction. So let's get started.

Every night for one week, you will be asked to set aside 10 minutes to write a letter from your future self to your current self. Writing a letter from a "future self" may seem awkward at first, but please stick with it for one week. There is no 'right' or 'wrong' answer and it will get easier.

Imagine yourself in the future (6 months/ 1 year / 2 years/ 5 years /10 years from now – Pick a time frame that makes sense to you) in terms of your family relationships. Imagine you are in a better place where you have resolved some of the issues that are concerning you now.

1) Describe where you are, what you are doing, and what is happening in your family life. Enrich with as much detail as possible:

2) Tell yourself the crucial things you realized or the critical steps you took to get there. Give yourself some sage and compassionate advice from a better future.

Appendix B: Project Hope 2 Exercise Descriptions

Meditation/Reflecting on Your Day

Sometimes our lives can be so fast-paced that we often forget to take a moment and contemplate the day to day events that occur. We also sometimes have a tendency to get so wrapped up in thinking about our past that we forget to focus on the here and now. Thus, it can be important to learn tools that can help us to pay attention to the present and reflect on our daily lives. You will be asked to practice two exercises that will alternate over the next month, and that will help you think more reflectively and live in the moment.

> **Reflecting on Your Day**: The importance of self-knowledge has long been recognized, and reflecting on our day may help us become more aware of who we are. Reflection can also provide insight about our goals and values. Furthermore, research has also shown that writing about one's life experiences may enhance psychological well-being.
> **Meditation:** Meditation is a way of thinking that involves being aware and mindful of your present surroundings. Practicing meditation is an ability that has been associated with many mental and physical health benefits, as well as reductions in stress and better concentration.

Steps to Reflecting on Your Day:
Take a moment and reflect on your day in as much detail as possible. If you cannot remember some of the details, that's OK. Just type down what you can remember. Try to include what you were doing, what you were feeling, and the other people who were with you. Here is an example: *Today was Tuesday and I had a lot to do at work, so I spent most of the morning finishing a project for my boss. I felt very stressed out at first, but by lunch time I was feeling calmer. At lunch, I went out to my favourite pizza place with my friend from work. The rest of the day was spent working with Bob on an upcoming project that is due next week. After work, I went home and had dinner with my kids. I was quite tired by the end of the day, so got into bed with a good book.* **Now, its your turn to answer.** Briefly review your answer. Perhaps you recalled part of your day that you hadn't initially remembered. Or, maybe reflecting on your day helped you better understand a situation that you experienced. Remember, you can always take a few minutes time to reflect on your day whenever you need it.

Steps to Meditation:
In a comfortable position, begin by taking slow, deep breaths from your stomach. Breathe in deeply through your nose, and out slowly through your mouth, concentrating on your breath. Imagine all your stress leaving your body with each breath you take and each passing moment. To help you focus, you may want to silently count each breath you take. Or, it might be helpful to visualize a relaxing place that you've seen or been to. If you find your mind wandering, that is OK, just bring your attention back to your breath.

When you are ready you can start the timer, close your eyes, breathe deeply, and take approximately 5 minutes to engage in your meditation practice. The timer will make a sound to signal when five minutes has passed, so please make sure to have the sound turned up on your computer. Bring your focus back to your body in the present moment. Take notice of your breathing. Take a few more minutes to conclude your practice. In between your meditation exercise, try to continue practicing deep breathing.

Loving Kindness/Challenging your Negative Thoughts

Life can be stressful at times, causing us to think and feel more negatively about our lives. Thus, it can be important to learn tools that can help us to think and feel more positively about ourselves. You will be asked to practice two exercises that will alternate over the next month, and that will help you think more positively and feel better.

1) **Challenging your Negative Thoughts**: When we face a stressful situation, our thoughts can easily get negative and can leave us feeling miserable. Thus, it can be important to learn ways to challenge our negative thinking and view our self, others, and the world more positively and realistically. Challenging negative thinking has been associated with benefits, including reduced depression and anxiety symptoms, as well as higher self-esteem.
2) **Loving-Kindness:** Loving-kindness is a positive approach to life where you learn to be mindfully compassionate to yourself and others. While "love" can be romantic, love can also be thought of as a deep rooted goodness or friendliness that can be extended to yourself. Practicing loving kindness is an ability that has been associated with many mental health benefits, including reductions in depressive symptoms and pain, and more satisfaction with life. The goal of this exercise is to help you learn to generate loving-kindness in order to re-focus your thoughts and feelings on being more accepting, and non-judgmental towards yourself and others.

Steps to Challenging your Negative Thoughts:

1) **Please briefly explain an event or situation that left you feeling distressed**. Where and when did this occur? Who were you with? Here is an example: *I was at work yesterday and my boss called me into her office to tell me I made a mistake on a big project I had been working really hard on.*

2) Think about the thoughts that go through your mind related to this situation, especially the thoughts that caused you to experience negative feelings about yourself. For example, thinking that you "are a failure" may trigger feelings of sadness. So what do you think this event says about you? What do you think others are saying in this situation? What does it mean about your life and future? Are you afraid something might happen? **List your negative thoughts, and put an asterisk (*) next to the one that stands out the most.** Here is an example: *Making this mistake means I'm a failure. I think my boss must be planning to fire me for this. All the other employees are better at this job compared to me.*

3) Let's work with that thought that sticks out the most. Just as every human being deserves a fair trial, each of your thoughts deserves a "trial" as well, where you evaluate its accuracy. **What is the evidence supporting your concern or this negative thought?** For example: *The secretary down the hall told me that my boss is planning on making*

some job cuts soon. 2) The first month on the job I made a mistake on another project and my boss must remember that.

4) Now challenge your negative thought. What is the other side of the argument? What would I say to a friend in a similar situation? What experiences have you been through that suggest this thought is not completely true? **What is the evidence *against* your negative thought?** For example: *My boss did give me a small promotion two weeks ago. When my boss called me into her office, she did preface the conversation by saying that mistakes can happen to anybody, and this was a hard project\ I did learn how I can better (and more efficiently!) do this type of project next time*

5) Try to be positive and realistic, taking into account evidence for and against your negative thought. Is there an alternate way you could understand this situation? Could a friend think of another way of interpreting the situation from a different perspective? **What is a more balanced, alternative thought?** Here is an example: *Even though I made a mistake, I can learn from this experience. My boss acknowledged that this was a tough project (and that no one is perfect!) and has recently rewarded me with a small promotion, so there is little evidence that she would actually fire me.*

Check in with how you are thinking and feeling about this situation now. Perhaps the event doesn't feel as catastrophic as it did initially. Or, there may be very minor changes after this exercise – though persistence nearly always results in significant improvement. Remember, you can use this cognitive technique to re-evaluate and re-interpret a distressing event at any time.

Adapted from Greenberger & Padesky, 1995.

<u>Steps to Loving Kindness:</u>

Sit in a comfortable position and begin by taking slow, deep breaths. Bring your awareness to your heart, imagining as if each breath allows your heart to grow just a bit more. Take a moment and try to remember a time when you have been a loving and kind friend to others, or when someone has shown kindness or generosity towards you. Often we can be so hard on ourselves, but everyone deserves to feel loving kindness. Next, observe the following phrases with love and kindness. You may even want to try saying them out loud:

May I be happy.
May I be healthy.
May I be peaceful.
May I be safe.

When you are ready you can start the timer, close your eyes, breathe deeply, and take approximately 5 minutes and repeat these phrases to yourself, focusing on opening your

heart and feeling loving-kindness towards yourself. Be mindful of the physical sensations as you let yourself take in these warm feelings. It's okay if it feels difficult or challenging at first; cultivating warmth towards oneself can take practice and there is no "right" or "wrong" way of doing it. The timer will make a sound to signal when five minutes has passed, so please make sure to have the sound turned up on you computer.

For the next five minutes, bring your focus back to your body in the present moment. Notice your breath. Continue to generate these feelings of care and compassion for yourself. In between your loving kindness meditation practices, try to be kind to yourself.

Adapted from Brantley & Hanauer, 2008, Finkel, 2008, & Salzberg, 1995

Positivity

Positivity involves a wide range of positive emotions like joy, gratitude, hope, inspiration, and love. Research has shown that feeling these positive emotions in your daily life can increase your overall well-being. For example, it builds your psychological strength and allows you to be more optimistic and resilient. Increased positivity also makes you healthier physically and reduces your risk of some diseases. Finally, relationships have been shown to grow closer and stronger when you have positivity in your life. This month, you will be asked to work on the different emotions that are part of positivity. You will have an exercise to increase your experience of joy, then one to increase gratitude and so on. By doing these exercises every other day, you will improve your overall positivity and your well-being.

Emotion #1: Joy. You will focus on cultivating the experience of JOY for the next day or so. Performing activities that will increase your feelings of joy and happiness can be very beneficial to your emotional and physical well-being, as well as your satisfaction with life. Think of a time when you felt glad and joyful, when you were overcome with the delight of the moment. You might also consider times when things were going your way or when every outcome was even better than expected. These are times you would have felt full of life, playful and joyous. When have you felt that bubble of joy and you just couldn't stop smiling? Examples could include: eating your favourite food, listening to your favourite song, engaging in a hobby, playing with your pets or children, getting together with friends, or watching a happy movie. Over the next day, try to engage in an activity that will leave you feeling joyful, glad and happy. You can rely on examples from the past, or engage in new behaviours. Your feeling of joy does not need to last a long time to provide beneficial effects.

Emotion #2: Gratitude. Over the next day or so, you will focus on cultivating the experience of GRATITUDE. Performing activities that will increase your feelings of gratitude and appreciation can also be very beneficial to your emotional and physical well-being, as well as your satisfaction with life. Think of a time when you felt grateful or thankful for the actions of others. You might also consider times when someone has gone out of their way to be helpful or generous towards you. Remember how appreciative you were of their kindness. These are times you would have rejoiced in your good fortune, treasuring the gifts given to you. When have you been inspired to give back to others? Examples could include: make a list of people and things you are grateful for in your life, send an email to thank someone or express it in person, give someone a huge in gratitude, or help someone in need. Over the next day, try to engage in an activity that will leave you feeling grateful, appreciative and thankful. You can rely on examples from the past, or simply make up a list of what you are grateful for. Your feeling of gratitude does not need to last a long time to provide beneficial effects.

Emotion #3: Serenity. Over the next day or so, you will focus on cultivating the experience of SERENITY. Performing activities that will increase your feelings of

serenity and peacefulness can also be very beneficial to your emotional and physical well-being, as well as your satisfaction with life. Think of a time when you felt fully at peace with your life, experiencing total contentment. You might also consider times when you felt comfortable with your life and yourself, when your body felt relaxed and free from stress. These are times you would have felt like taking a step back, basking in the serenity of your situation. Can you think of ways to get this feeling in your life more often? Examples could include: have a warm cup of tea, looking at nature, practicing yoga or meditation, thinking about a previous, relaxing vacation, or listening to calming music. Over the next day, try to engage in an activity that will leave you serene, content and peaceful. You can rely on examples from the past, or engage in new behaviours. Your feeling of serenity does not need to last a long time to provide beneficial effects.

Emotion #4: Interest. Over the next day or so, you will focus on cultivating the experience of INTEREST. Performing activities that will increase your feelings of interest and curiosity can also be very beneficial to your emotional and physical well-being, as well as your satisfaction with life. Think of a time when you felt completely alert, inquisitive and deeply fascinated in the life around you. You might also consider times when you felt intrigued by the unknown or driven to discover more. You may also have delighted in trying something new. These are times that make you feel alive and eager to learn more. When have you felt the need to lose yourself in curiosity and explore new ideas? Examples could include: explore new places or ideas, read about something new on Wikipedia, get to know more about people, or try anything new. Over the next day, try to engage in an activity that will leave you feeling inquisitive and interested. You can rely on examples from the past, or engage in new behaviours. Your feeling of interest does not need to last a long time to provide beneficial effects.

Emotion #5: Hope. Over the next day or so, you will focus on cultivating the experience of HOPE. Performing activities that will increase your feelings of hope and optimism can be very beneficial to your emotional and physical well-being, as well as your satisfaction with life. Think of a time when you felt hopeful and optimistic about the future. You might also consider times when you have faced uncertainty but still believed things would turn out for the better. These are times you have longed for a positive outcome. When have you worked hard to ensure the better future you believe is possible? Examples could include: make a list of your goals for the future, looking forward to a happy event coming up, contemplate your spiritual beliefs, or think of a better future. Over the next day, try to engage in an activity that will leave you hopeful, optimistic and encouraged. You can rely on examples from the past, or engage in new behaviours. Your feeling of hope does not need to last a long time to provide beneficial effects.

Emotion #6: Pride. Over the next day or so, you will focus on cultivating the experience of PRIDE. Performing activities that will increase your feelings of pride and confidence can be very beneficial to your emotional and physical well-being, as well as your satisfaction with life. Think of the time when you have felt most self-assured and confident in yourself and your abilities. You might also consider times when you have

felt pride after achieving a long-awaited goal. These are times you have held your head high, feeling worthy of praise and admiration. When have you been drawn to dream big for the future? Examples could include: put your best effort into a project, think about your past achievements, wear an outfit that makes you feel confident, think about a significant other who has done well, or participate in something you are good at. Over the next day, try to engage in an activity that will leave you proud, confident and self-assured. You can rely on examples from the past, or engage in new behaviours. Your feeling of pride does not need to last a long time to provide beneficial effects.

Emotion #7: Amusement. Over the next day or so, you will focus on cultivating the experience of AMUSEMENT. Performing activities that will increase your feelings of amusement and joviality can be very beneficial just as are the other positive emotions. Think of a time when you have felt silly and fun-loving. You might also consider times when you were startled to laughter by some unexpected humour. These are times you have the need to share your amusement with others, to enjoy the moment and laughter with children or friends. When have you and others been overcome with infectious laughter? Examples could include: dancing around your room to your favourite song, watching a funny YouTube clip or TV show, calling a friend to reminisce about a funny time you shared, or playing a game. Over the next day, try to engage in an activity that will leave you feeling amused, silly and fun-loving. You can rely on examples from the past, or engage in new behaviours. Your feeling of amusement does not need to last a long time to provide beneficial effects.

Emotion #8: Inspiration. Over the next day or so, you will focus on cultivating the experience of INSPIRATION. Performing activities that will increase your feelings of inspiration can be very beneficial as all other positive emotions to your physical well-being, as well as your satisfaction with life. Think of a time when you have felt truly inspired by goodness by seeing the best of humankind. You might also consider times when you have witnessed true human brilliance or felt humbled by another's actions. These are times you have seen such excellence that you felt inspired to greatness. When have you felt inspired, so that you too might reach your full potential? Examples could include: call someone or communicate with someone you admire, read an inspirational book or quote, read something written by your favourite author, think of others who overcame adversity, or think about someone who has excelled. Over the next day, try to engage in an activity that will leave you inspired, up-lifted and motivated. You can rely on examples from the past, or engage in new behaviours. Your feeling of inspiration does not need to last a long time to provide beneficial effects.

Emotion #9: Awe. Over the next day or so, you will focus on cultivating the experience of AWE. Performing activities that will increase your feelings of awe and wonder can be very beneficial to your emotional and physical well-being, as well as your satisfaction with life. Think of a time when you have felt deep amazement or astonishment, when you have been truly in awe. You might also consider times when you have been overcome by greatness or genuine beauty. These are times you have been overwhelmed with awe by

something amazing. When have you been left speechless in the face of something so much more powerful? Examples could include: take a few moments to observe nature, look up at the sky or at the stars, think about previous moments where you were in awe, think about amazing accomplishments by great leaders, or look up YouTube clips of amazing feats. Over the next day, try to engage in an activity that will leave you awed and amazed. You can rely on examples from the past, or engage in new behaviours. Your feeling of awe does not need to last a long time to provide beneficial effects.

Emotion #10: Love. Over the next day or so, you will focus on cultivating the experience of LOVE. Performing activities that will increase your feelings of love and closeness can be very beneficial to your emotional and physical well-being, as well as your satisfaction with life. Think of a time when you have felt loving towards another person and loved in return, trusting them completely, whether it be with a friend, family member or romantic partner. You might also consider times when you have felt safe and secure within an interpersonal relationship, feeling close to the other person. These are times you find yourself drawing close to your loved one, feeling the urge to just be with them and enjoy their company. Think of moments in your relationships that increase one of the other positive emotions. This could be joy, gratitude, serenity, interest, hope, pride, amusement, inspiration or awe. Examples could include: contact someone you love, cuddle or express affection for a loved one, look at loved ones and remember the feelings you have towards them, or tell someone you love them. Over the next day, try to engage in an activity that will leave you loving and trusting. You can rely on examples from the past, or engage in new behaviours. Your feeling of love does not need to last a long time to provide beneficial effects.

Curiosity

The important thing is not to stop questioning. Curiosity has its own reason for existing.
– Albert Einstein

In an uncertain world, we tend to stick with structure and routine because it is predictable and makes us feel safe. However, when things become familiar, we tend to tune out and get bored. Research has shown that curious people who regularly engage in interesting new activities have greater satisfaction with life. The goal of your exercise will be to become more curious – to open your eyes to the fact that novelty is everywhere! A fresh perspective and exciting new experiences are within your reach every day. You will learn to look beyond uncertainty and instead see opportunities for learning, discovering, and growing.

In the next three weeks, you will cultivate your curiosity in the three domains of your life - *love*, *work*, and *play*.

The *love* domain includes social activities and interactions with other people such as:
1) Asking more questions and being a keen listener with family members
2) Being open to your loved one's perspective (i.e. what is she/he really feeling?)
3) Striking up a conversation with someone you don't know very well

The *work* domain involves productive activities at work, at school, or at home such as:
1) Asking for new opportunities with your boss or co-workers
2) Try to develop a new skill or acquire a new piece of knowledge
3) Think of different solutions to a familiar problem

The *play* domain consists of leisurely activities you do for your own enjoyment such as:
1) Cooking a new recipe with ingredients you've never tried before
2) Trying a new bath or beauty product
3) Exploring an interesting new place

This is only a partial list of the countless ways in which you can develop your curiosity. You will cultivate your curiosity in these three domains as you see fit. Each time you visit the website, you will be asked if you were able to engage in a new, curious activity since you last logged in and, if so, briefly describe it.

Acts of Kindness

Kindness is a character strength that means acting supportive, kind and caring towards others. This can involve doing favours and good deeds for others or helping them. Research has shown that being kind and compassionate to a significant other can lead to increased self-esteem, reduced depressive symptoms and general happiness. Practicing compassion can lead to better relationships and greater life satisfaction. The goal of this exercise is to help you learn to be compassionate towards someone you're close with.

To begin, think of someone close to you. This person can be a relative, a good friend, or significant other. This person should have an important presence in your life and should be someone with whom you want to cultivate a better relationship. Specifically, you should try and strengthen a close relationship using this exercise. Over the next day or two, try to actively demonstrate kindness in your interactions with this person. That is, behave in a loving or helpful way towards this individual.

Some examples of acts of kindness include:

1. Making dinner for your significant other after a long day
2. Being supportive to a friend who is going through a hard time
3. Helping a parent
4. Trying to meet the needs of the person you care about
5. Being more physically affectionate towards a close one
6. Being understanding and supportive of a close one

These are only some examples of ways you can act compassionately within a close relationship. Try to think about the best acts of kindness you can show this person.

When you log back in to the website again, you will be asked to note whether you were able to perform an act of kindness since you last logged on, and, if so, to briefly describe that act.

Optimism

"A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty" – Winston Churchill

Is there someone in your life who seems to be able to find the bright side to just about any situation? Is he or she always confident that the future will turn out ok, that challenges can be conquered? This person is likely a highly skilled optimist. Research has shown that being optimistic comes with a number of impressive benefits. Optimistic people are happier and healthier than non-optimistic people. They have lower rates of depression and cope better with stress. They experience more positive thinking, feel more capable of solving problems, and produce more creative solutions to problems. They have stronger social networks and experience greater satisfaction in their relationships. Optimism is also self-reinforcing: being optimistic in the present increases your chances of being more optimistic in the future. Whether you already see yourself as an optimist or not, it is possible to enrich your life by cultivating optimism. The exercises that you will be asked to complete over the following weeks have been carefully crafted to guide you towards becoming more optimistic in your daily life. With regular practice, you will soon notice that you're feeling better about yourself and your future!

Exercise A:

A key component of optimism is the ability to focus on the positive in your life. This involves paying more attention to the things that are going well, and finding a bright side to obstacles or challenges that make life more difficult. Today's exercise will guide you through the practice of focusing on the positive. Follow the directions below to complete this exercise.

1) List 5 things that make you feel like your life is enjoyable, enriching, and/or worthwhile at this moment. These things can be as general as 'being in good health' or as specific as 'drinking a delicious cup of coffee this morning'.

2) Think about the most recent time when something didn't go your way, or when you felt frustrated, irritated, or upset. Describe this situation, and list 3 things that can help you see it more positively.
=> Remember: Every cloud has a silver lining. It may be difficult to find something good in a bad situation, but with practice, you'll get better and better at finding that silver lining!

> *For example, perhaps you missed your bus this morning (how frustrating!). Three ways to look on the bright side in this situation might be:*
>
> > *1. Even though you missed the bus, you got some good exercise when you were running to catch it.*
> > *2. Having to take a cab instead meant that you had a more comfortable ride than you would have had on the bus.*

3. Ten years from now, you likely won't remember what happened this morning.

Now it's your turn! First, briefly describe the situation. Next, list 3 things that can help you see the bright side this situation.

Exercise B:

A key component of optimism is having confidence in your ability to achieve the goals that you set for yourself. When you believe that you will be successful, it encourages you to work harder towards achieving that goal. Greater effort then increases the chance that you will actually succeed! Today's exercise will help you to become more confident in your ability to succeed at an important goal by encouraging you to plan in detail how you will go about accomplishing it. Follow the directions below to complete this exercise.

1) Briefly describe one goal that you would like to achieve in the next day or two. Make sure that this goal is realistic and not too time-consuming (ex. *tidy up the hall closet* rather than *clean the entire house top to bottom*) and something that is important to you (ex. *spend more time with the kids* rather than *learn about the life cycle of the common fly*).

2) Visualize how you will go about accomplishing this goal. Below, briefly describe the steps that you will take to meet this goal.

For example, if your goal is to tidy up the hall closet, these are the steps that you might take to achieve it:

- schedule 1 hour tonight that you will devote to cleaning
- turn off your cell phone/other distractors
- put on some comfortable clothes
-turn on some upbeat music
- break down the job into sub-tasks: take everything out of the closet, sweep the floor, dust the shelves, get rid of stuff that you don't need any more, sort the things that you want to keep and put them in boxes, put the boxes back in the closet
- reind yourself that it's ok if you don't do everything perfectly, or complete the entire task