Enhancing social relationships through positive psychology activities: a randomised controlled trial

Brenda H. O'Connell, DEIRDRE O'SHEA, STEPHEN GALLAGHER

Enhancing social relationships through positive psychology activities: A Randomized Controlled Trial

Brenda H. O' Connell[a]*, Deirdre O' Shea[b], & Stephen Gallagher[a]

[a]Centre for Social Issues Research, Department of Psychology, University of Limerick, Ireland

[b]Personnel & Employment Relations, University of Limerick, Ireland

*Corresponding Author. Email: Brenda.oconnell@ul.ie

Enhancing social relationships through positive psychology activities: A Randomized Controlled Trial

Despite the robust relationship between wellbeing and social relationships, the latter has received little examination within positive psychology activities (PPAs). This study aimed to test whether kindness and gratitude-based PPAs, through positive social interaction with peers, enhanced relationship satisfaction. Using a longitudinal randomized controlled design, 225 participants were assigned to one of three conditions (relationship-focused, self-focused, or control) and completed measures of relationship satisfaction, social support, and happiness on three occasions (baseline, post-intervention, and six-weeks). The experimental PPAs were relationship-focused (involving social interaction) or self-focused (no social interaction). Those who completed relationship-focused PPAs had greater increases in relationship satisfaction than the self-focused and active control activities at six-week follow-up. Additionally, only those in the relationship-focused condition felt their existing friendships had improved at intervention cessation. Regardless of participants' initial levels of social support, the intervention effects remained. In conclusion, PPAs fostering social kindness and gratitude significantly strengthened people's satisfaction with their relationships.

Keywords: gratitude; happiness; kindness**;** positive psychology; relationship satisfaction; social support

In the past two decades the positive psychology movement has yielded an unprecedented growth of empirical investigations into advancing optimal human functioning and improving wellbeing (Fowler, Seligman, & Koocher, 1999; Lyubomirsky & Layous, 2013). At the forefront of this research is the examination of tools and techniques to enhance individual strengths and qualities and encourage positive mental health and happiness. This body of work has instigated the development of positive psychology activities (PPAs). A plethora of research has found that engaging in PPAs, including counting one's blessings (Froh, Sefick, & Emmons, 2008; Seligman, Steen, Park, & Peterson, 2005), gratitude visits/journals (Emmons & McCullough, 2003), and acts of kindness (Buchanan & Bardi, 2010), significantly increase various outcomes of wellbeing and happiness, and reduce depressive symptoms compared to control activities. Meta-analysis has demonstrated effectiveness for up to six months after intervention cessation (Sin & Lyubomirsky, 2009). These PPAs are theoretically guided and underpinned by a positive-activity model (Lyubomirsky & Layous, 2013). This model identifies primary conditions and characteristics required for PPAs to be efficacious, suggesting that characteristics of the activity itself (for example, timing, dosage, variety, self/other orientated), and characteristics of the individual (for example, motivation, effort) that are most likely to influence the efficacy of the activity. Emerging research has identified social support as one key characteristic influencing intervention effectiveness (Lyubomirsky & Layous, 2013). Despite this however, no research has specifically examined the role of social support as an influencing factor in PPA outcomes, thus it is unclear whether individual levels of social support before engaging in PPAs acts as a moderator of these activities. Given that social support has an integral influence in determining people's level of wellbeing and happiness (Demir, Özdemir, & Weitekamp, 2007; Myers, 2000) there is a need to examine their role in PPAs effectiveness for both theoretical and health reasons.

Similarly whether or not PPA activities can be tailored to enhance satisfaction with relationships is yet to be explored. To date, PPA research has focused almost exclusively on the individual as an autonomous entity, with little emphasis on the individual as an intrinsically social being. Although the positive-activity model (Lyubomirsky & Layous, 2013) has enhanced our understanding of how PPAs lead to improvements in wellbeing, the effect of PPAs on social relationships is underspecified, with more evidence needed to determine when and how PPAs can potentially improve social relationships. Kok and colleagues (2013) recently found that engaging in loving-kindness meditation improved individuals' perceptions of their positive social connections with others, which may also be applicable to other PPAs; for example Layous et al., 2012 found that when students engaged in kind acts, they received improvements in peer acceptance. In light of this evidence and given that healthy social relationships are consistently causally linked to wellbeing and happiness (Demir, et al., 2007) research examining how relationships are influenced by PPAs is fruitful and clearly warranted.

The Importance of Relationships in PPAs

The psychological literature, spanning positive psychology, health psychology, clinical psychology, and social psychology, is replete with experimental and observational findings displaying the psychological, emotional, and social health benefits of having high quality social relationships, and conversely, the risks of social isolation (Cantwell, Muldoon, & Gallagher, 2014; Cohen, Gottlieb, & Underwood, 2000; Gallagher & Whiteley, 2012). Meta analytical studies have shown that people with better quality social relationships have enhanced wellbeing and life satisfaction (Chu, Saucier, & Hafner, 2010; Lyubomirsky, King, & Diener, 2005), are more resilient in the presence of stress (Viswesvaran, Sanchez, & Fisher, 1999), are less depressed and even live longer (Cohen, 2004; Holt-Lunstad, Smith, & Layton, 2010). Additionally, the friendship-happiness relationship is well established in the

literature (see Demir, Özen, & Procsal, 2014 for review), with friendship satisfaction and frequency of interactions with friends consistently showing positive associations with happiness (Berry & Hansen 1996; Camfield, Choudhury, & Devine 2009). Moreover, studies of 'happy' people across the globe have revealed that they have closer, more fulfilling social relationships compared to those who are less happy (Diener, 2009; Myers & Diener, 1995). Consistent with these findings, results from a cross-sectional study on college students showed that those happiest differed from both the 'average' and 'unhappy' individuals in their levels of satisfying interpersonal lives. Very happy people indicated that they were extremely satisfied with their current friendships and spent little time alone compared to the less happy comparison groups, and it was concluded that satisfying social relationships is a necessary condition for high levels of individual happiness (Diener & Seligman, 2002). Similarly, research indicates that it is not the number of friends people have that is important for health, but rather the quality and satisfaction of these relationships (Vandervoort, 1999). Seligman (1991) argued that the ever increasing emphasis on individualistic Western ideologies inevitably leads to impoverished social relationships and connections, and are in part responsible for the pervasive incidences of depression in society today. Given that strong social ties and satisfying relationships are consistently linked to happiness and wellbeing it seems logical that PPAs deliberately designed to enhance social relations have the potential to improve wellbeing and health. Moreover, recent research has identified a paucity of well-designed or tested interventions to improve social relationships (Cohen & Janicki-Deverts, 2009), and highlighted the critical need for interventions to increase social closeness (Kok & Fredrickson, 2013) thus making this line of enquiry timely and required.

Furthermore, despite the application of positive psychology interventions in clinical and educational practice to aid positive mental health, such research has come under methodological critique due to an over reliance on cross-sectional research and poor

experimental trial quality and reporting (Bolier et al., 2013). Regardless of whether these criticisms are warranted or not, PPA research should pursue the highest standards available to test interventions. The latter critiques are particularly important, as the ability to replicate and utilise findings for evidence-based policy and practice is hindered by inadequate reporting of randomized controlled trials, both in positive psychology interventions, and more generally in psychological health interventions. The current research addresses such critiques of suboptimal reporting quality in past research by adhering to the Consolidated Standards of Reporting Trials developed by the CONSORT Group (CONSORT; Schulz, Altman, & Moher 2010). Furthermore, the present study employed an 'active' control activity, addressing another frequent methodological concern of previous PPA research (Mohr et al., 2009; Parks, 2014). This protocol facilitated accuracy, transparency, and rigor in the current investigation (See Appendix).

Additionally, there is a dearth of studies comparing fundamental activity features that differentiate PPAs from one another. For example, PPAs that are social or relationship-focused in nature (e.g. acts of kindness), compared with activities that are not orientated towards others, but rather self-focused (e.g. identifying signature strengths), may differ in their desired and subsequent wellbeing outcomes, which in turn may impact person-activity matching or fit (Lyubomirsky & Layous, 2013). Many PPAs have a social relations component (e.g. acts of kindness), but the impact of the social in these activities has remained underspecified and to date has received little attention. The current study sought to address these aforementioned caveats and inform the positive-activity model by comparing the efficacy of PPAs that asked individuals to engage in parallel interventions which differed only in whether they involved social interaction with peers (relationship-focused) or no social interaction (self-focused), and compared these to an active control activity; all of which aimed to improve happiness and psychosocial outcomes. Furthermore, as suggested by

Layous and Lyubomirsky (2012), how these activities influence outcomes may be moderated by participant's baseline levels of perceived social support, is a concept yet to be tested. For example if participants feel they have inadequate social support to begin with, this may inhibit their ability to engage in PPA's aimed at other people, as they may not be willing or motivated; both of which are important in PPA effectiveness (Layous & Lyubomirsky, 2012).

The Current Study

Based on the above evidence, the aim of the present study was to examine the role of social interactions in gratitude and kindness-based PPAs and examine the extent to which these simple activities could improve friendship and relationship satisfaction. Gratitude and kindness-based PPAs were chosen as longitudinal data demonstrates that these are not only associated with greater levels of wellbeing and social support, but are embedded in healthy social relationships (Wood, Froh, & Geraghty, 2010). Being kind to others has shown to be more psychologically beneficial than receiving help from others (Brown, Nesse, Vinokur, & Smith, 2003) and higher levels of gratitude are associated with improved relationships (Algoe, Haidt, & Gable, 2008; Emmons & Shelton, 2002; McCullough, Kilpatrick, Emmons, & Larson, 2001). Past studies employing longitudinal designs have shown that expressing gratitude leads to social benefits for women with metastatic breast cancer (Algoe & Stanton, 2012). Additionally, experimental manipulations of gratitude reveal that expressing gratitude to a romantic partner improves their perception of the communal strength of the relationship (Lambert, Clark, Durtschi, Finham, & Graham, 2010, Study 3), increases participants positive perception of their partner, and leads to higher comfort in voicing concerns about the relationship, depicted as a form of relationship maintenance (Lambert & Fincham, 2011, Study 4) compared to control conditions. They were also chosen because although they have traditionally focused on showing general gratitude or kindness to others, they can easily be

manipulated so that the focus is on showing gratitude or kindness to specific others and oneself. Social relations were targeted by employing analogous PPAs which varied in the extent to which they emphasised a self-focus or a relationship-focus. In light of this evidence, it was hypothesised first, that those who completed a PPA (either gratitude or kindness-based) that was social or relationship-focused in nature would have greater improvements in relationship satisfaction, happiness, and perceived friendship improvement than those who completed the comparable self-focused gratitude or kindness-based PPA, and also an active control activity. This was assessed at post-intervention and at a six week follow-up. Second, this research sought to explore whether initial levels of perceived social support moderated the effects of the PPA on the proposed outcomes.

Methods

Participants

Three-hundred and eight participants (177 females) were recruited online through Amazon's Mechanical Turk (MTurk). Mturk is a novel web-based service system that has been validated for experimental subject recruitment (Buhrmester, Kwang, & Gosling, 2011). This method was chosen firstly, due to its timely and inexpensive nature relative to other subject pools, and secondly, participants are more representative of the population and diverse than undergraduate samples (Mason & Suri, 2012; Paolacci, Chandler, & Ipeirotis, 2010) allowing for increased generalizability; a methodological improvement for PPA research (see Parks, 2014).

At the randomization stage, in terms of ethnicity, 78.8% were Caucasian, 9.8% identified as African-American, 2.2% as Hispanic, 7.1% Asian, and 2.2% as "Other". In terms of nationality, the majority of participants identified as American (74.2%), or European (18.2%), with 3.6% Asian, and 4% missing cases. Most participants were single (56.9%),

while 32% reported that they were married, and the remaining 11.1% were separated, divorced, or widowed. Participant ages ranged from 18 to 66 years ($M = 34.17$, $SD = 12.36$).

Participants were invited to complete a three-part study in return for $1 payment in total. Inclusion criteria included all ages over 18 and English language proficiency, as this was the primary language of the researchers and all questionnaires utilised in the study were designed for English speakers. Ethical approval for this study was given by our local university research ethics committee. All interested participants provided online informed and voluntary consent.

Design

The present study used a randomized placebo-controlled between groups longitudinal trial. It had three main measurement sessions (baseline, post-intervention assessed following one week of assigned activities, and a six-week follow-up), with time serving as the within-subjects factor and treatment group as the between-subjects factor. All participants were randomly allocated according to the CONSORT guidelines (Schulz et. al., 2010) to one of five exercises described below (See Figure 1). Overall relationship satisfaction and perceived friendship improvement were the primary outcome measures, and happiness was the secondary outcome measure.

Intervention

All participants, regardless of condition, were instructed to complete their assigned activities every second day over seven days. Participants were randomly assigned to one of three conditions as outlined below.

Relationship-focused activities. Participants in the relationship-focused condition were assigned to either a gratitude or kindness activity that was relationship-focused (RF). Those assigned to the RF gratitude activity were instructed to 'Write and deliver a positive message

(email, text, face-to-face) to someone in your social network (friend, family, colleague),

thanking or praising them for something you are grateful for, and reflect upon your feelings

and the reaction of the receiver' (adapted from Emmons & McCullough, 2003; Froh, Kashda,

Ozimkowski, & Mille, 2009; Seligman et al., 2005). Those assigned to the RF kindness

activity were instructed to 'Do something kind for someone in your social network (friend,

family, colleague), and reflect upon your feelings and the reaction of the receiver' (adapted

from Layous, Nelson, Oberle, Schonert-Reichl, & Lyubomirsky 2012; Otake, Shimai,

Tanaka-Matsumi, Otsui, & Fredrickson, 2006).

Self-focused activities. Participants in the self-focused condition were assigned to either a

gratitude or kindness activity that was self-focused (SF). Those assigned to the SF gratitude

activity were instructed to 'Write a positive message to yourself praising something about

you that you are grateful for and reflect upon your feelings' (adapted from Emmons &

McCullough, 2003; Froh et al., 2009; Seligman et al., 2005). Those assigned to the SF

kindness activity were instructed to 'Do something kind for yourself, and reflect upon your

feelings' (adapted from Layous et al., 2012; Otake et al., 2006).

Control Activity. Those in the control condition were asked to list three things that occurred

over the day and reflect upon how they felt (adapted from Froh et al, 2009; Sheldon &

Lyubomirsky, 2006).

{Insert Figure 1 about here}

Measures

All information was obtained for the following self-assessed measures online using

QuestBack (www.unipark.com) survey software at the three time-points.

Socio-demographics

At baseline standard socio-demographic characteristics were assessed (gender, age, marital

status, ethnicity, nationality). At baseline and all follow-ups, participants completed

assessments of happiness, perceived social support, and overall relationship satisfaction.

Further, perceived friendship improvement was assessed at post-intervention.

Happiness

Participant happiness was assessed using the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999). This is a four-item self-report scale designed to measure global subjective happiness. The SHS is scored on seven-point scale and contains two items where respondents characterize themselves using absolute ratings and ratings relative to peers eg. 'Compared to most of my peers, I consider myself'; *1= less happy, 7= more happy.* The other two items offer short descriptions of happy and unhappy people and respondents indicate the extent to which each characterization describes them, the final of which is reversed coded- 'Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?'; 1= *not at all, 7= A great deal.* Higher scores on this scale indicate greater happiness levels. Lyubomirsky and Lepper (1999) reported high internal consistency for the SHS with alphas ranging from 0.79 to 0.94. The current study reflected this, with satisfactory Cronbach's alpha coefficients at baseline, post- intervention, and follow-up, 0.91, 0.72, and 0.67, respectively.

Social Support

The Medical Outcomes Study Social Support Survey (MOSS; Sherbourne & Stewart, 1991) was used to assess perceived availability of social support which may have been a potential moderator. Participants were asked across 18-items how often each of the following kinds of support is available to them if they need it, for example, 'Someone to help you if you were confined to bed…'. Items were rated on a five-point Likert scale, ranging from 1= *none of the time* to 5= *all of the time.* Although perceived social support has been previously shown to be stable over time (Sarason, Sarason, & Shearin, 1986), given the nature of our

manipulations we aimed to explore whether or not this was true in this context. Thus, participants completed the measure at all three time points. The scale has been used previously in health and wellbeing research (Brand, Barry, Gallagher, in press; Gallagher, Phillips, Ferraro, Drayson, & Carroll, 2008), demonstrating high internal consistency (alpha >0.91; Sherbourne & Stewart, 1991). The current study reflected this, with satisfactory Cronbach's alpha coefficients at baseline, post- intervention, and follow-up, 0.98, 0.96, and 0.95, respectively.

Relationship Measures

Overall relationship satisfaction was assessed on a five-point Likert scale, where respondents were asked 'Overall, how satisfied are you with your relationships as a whole?'; 1=*Not at all satisfied*, 5= *Extremely satisfied*. At post intervention, participants indicated whether they thought their existing friendship/s had improved having completed the assigned activity, on a five-point Likert scale ranging from 1=*Not at all* improved to 5= *Extremely improved*. These items were employed as single item measures as they have been shown empirically and meta-analytically to be appropriate, quite reliable and valid for capturing global relationship satisfaction (Caceres & Paparoidamis, 2007; Kelly et al., 2010) and overall satisfaction across multiple domains (Scherpenzeel, 1995; Wanous & Hudy, 2001; Wanous, Reichers, & Hudy, 1997).

Procedure

After providing informed consent, participants completed baseline measurements, which took approximately ten minutes. Using the random allocation sequence feature of QuestBack, they were then assigned to one of the five activities described above. This ensured a double-blind design where both participants and investigators were blinded to PPA allocation. Instructions for completing the activities were outlined, and participants were requested to

complete post-intervention assessments online, one week and six-weeks later. Further, in order to monitor adherence issues, participants were asked to indicate the number of days they completed their exercises, and write a couple of sentences about what they did and how they felt in a text field. Finally, at the six-week follow-up, participants completed the same measurements again. Recruitment period and follow-up were conducted from September 2013- December 2013. All the above was conducted by the principal investigator.

Data analytic strategy

Descriptive analyses of baseline homogeneity between the three conditions and attrition bias were examined using independent samples t-tests and chi square analysis, to check the randomisation manipulation. Due to high rates of attrition in Internet-based studies (Parks, 2014; Wantland, Portillo, Holzemer, Slaughter, & McGhee, 2004) analyses of the completers was conducted, where only participants who completed the follow-up assessments were included in the analyses. Thus in order to preserve power, data from the RF gratitude and RF kindness activities were combined to create an overall RF condition, and likewise data from the SF gratitude and SF kindness activities were combined to create an overall SF condition[1], resulting in a 2:2:1 unequal allocation. To test the effectiveness of the RF condition, firstly on overall relationship satisfaction and subsequently on happiness at each follow-up, a mixed between-within analysis of variance was conducted with $\alpha = .05$ as criterion for significance. Further, because to the high percentage of missing values due to attrition, in line with Shapiro and Mongrain (2010), a sensitivity analysis on significant findings from the mixed between-within analysis of variance was conducted using multi-level modelling where maximum likelihood estimations were used to handle missing data. This analysis was employed using

---

[1] Mixed between-within analysis of variances revealed no significant differences in relationship satisfaction over time, between the RF gratitude and RF kindness activities $F(2, 52) = .734$, $p = 0.47$, $\eta^2_p = .03$, or between the SF gratitude and SF kindness activities, $F(2, 58) = 2.906$, $p = 0.063$, $\eta^2_p = .09$.

the linear mixed models feature in SPSS 21 using data from participants who completed at

least baseline and post-intervention ($n = 109$) to compare results to those obtained in the any

significant mixed between-within analyses of variance and determine the robustness of these

findings. This approach is recommended for studies with a large quantity of missing data

(Chakrborty & Gu, 2009) such as the present study.   To test the effect of condition on

perceived friendship improvement at intervention cessation a univariate analysis of variance

was conducted. Where appropriate, planned comparisons and post-hoc analysis were

conducted using Bonferroni pairwise comparisons, executed using the syntax features of

SPSS and Tukey Least Significance Difference for analysis of significant main effects. Two

mixed between-within analysis of variance and a univariate analysis of variance with baseline

perceived social support entered as a moderator was undertaken to determine whether any

treatment effects were influenced by perceived social support at baseline. In these analyses,

social support was transformed into a dichotomous variable using a median split. Throughout

partial eta squared (η^2_p) and Cohen's *d* is reported as a measure of effect size.

Results

Participant flow and preliminary analysis

Figure 1 illustrates the participant flow through each stage of the study following the

CONSORT guidelines (Schulz et al., 2010). Of the 225 participants who completed baseline

questionnaires, 71 (31.55%) completed both the post-intervention and follow-up assessments.

Participants who dropped out of the study ($n = 154$) did not differ than those who completed

all three parts ($n = 71$) with respect to demographic characteristics (ie, sex; $\chi^2(1) = .313$,

$p = .58$; age; $t(223) = .433, p = .67$), baseline happiness scores; $t(223) = -.39, p = .7$, and

relationship satisfaction scores; $t(223) = .63, p = .53$, however those who completed all three

parts had higher ($M = 3.9$) levels of social support than those who did not ($M = 3.55$)

complete all parts; $t(223) = 2.52$, $p = .01$.   Furthermore, there was no differential dropout

between the three conditions; $\chi^2(2) = .986$, $p = .61$.

Tests of baseline homogeneity were conducted and no significant differences were

found in sex; $\chi^2(2) = 1.54$, $p = .463$, age; $F(2,222) = 7.14$, $p = .49$, happiness; $F(2,222) = .768$,

$p = .465$, social support; $F(2,222) = .239$, $p = .788$, or relationship satisfaction; $F(2,222)$

$= .609$, $p = .545$, between the conditions, indicating successful randomisation. Reported

adherence to the PPA at post-intervention did not differ significantly between the conditions

($F(2, 103) = 2.05$, $p = .13$), with a mean usage of 3.1 days across conditions ($SD = 1.31$).

Refer to Table 1 for participants descriptive statistics for completers only at baseline ($n = 71$).

{Insert Table 1 about here}

The effect of condition on relationship satisfaction

A mixed between-within analysis of variance revealed a significant main effect for time,

$F(2,136) = 3.171$, $p = 0.045$, $\eta^2_p = .05$. Furthermore, a statistically significant Condition $\times$

Time interaction was found, $F(4, 136) = 2.516$, $p = .04$, $\eta^2_p = .07$, such that those in the RF

condition were more satisfied over time than those in the SF and control conditions. This

interaction is illustrated in Figure 2.

Further, post-hoc Bonferroni pairwise comparisons revealed that participants in the

RF condition were significantly more satisfied with their relationships at the immediate post-

intervention, $p = 0.004$, and six-week follow-up, $p = 0.001$, compared to baseline.

Participants in the SF condition were significantly more satisfied with their relationships at

the immediate post-intervention, $p = 0.03$, however scores began to return to baseline level at

follow-up; thus differences between baseline and follow-up were not significant, $p = 0.20$. In

contrast, there was no significant difference in scores on relationship satisfaction from

baseline to post-intervention, $p = 1.00$, or follow-up, $p = 1.00$, in the control condition (See

Table 2).

{Insert Table 2 about here}

Planned post-hoc comparisons revealed that at 6-week follow-up, scores on

relationship satisfaction in the control condition ($M = 3.89$, $SD = .786$) were significantly

lower than the RF condition ($M = 3.25$, $SD = 1.055$) with a medium to large effect size, $t(38)$

$= 2.135$, $p = .04$, 95% CI: 0.033 to 1.252, $d = .70$; however the control condition did not

significantly differ from the SF condition ($M = 3.45$, $SD = .85$) on relationship satisfaction at

follow-up, with a medium effect size*., $t(41) = .652$, $p = .32$, 95% CI: -.423 to .826, $d = 0.2$.

Further, as predicted, scores on relationship satisfaction in the RF condition were

significantly higher than those in the SF condition at follow-up, with a medium effect size,

$t(41) = 2.063$, $p = .04$, 95% CI: 0.13 to .87, $d = 0.55$.

{Insert Figure 2 about here}

The effect of condition on happiness

A mixed between-within analysis of variance revealed a significant main effect for time,

$F(2,136) = 3.492$, $p = 0.03$, $\eta^2_p = .05$. Although on visual inspection of Figure 3, it appears

that there was a significant Condition $\times$ Time interaction; this was not significant $F(4, 136) =$

$.896$, $p = .47$, $\eta^2_p = .026$.   Post-hoc analysis revealed statistically significant differences

between the mean scores at baseline and post-intervention ($p = .04$) and between baseline and

follow-up ($p = .031$), indicating a steady increase in happiness scores across time for all

conditions. There was no significant difference between mean scores at post-intervention and

follow-up ($p = 0.44$). Figure 3 indicates that although significant increases in happiness

occurred for each condition, those in the RF condition showed the greatest increases from

baseline to follow-up (mean difference = 0.492), followed by those in the SF condition (mean difference = 0.292) and lastly those in the control condition (mean difference = 0.25).

{Insert Figure 3 about here}

The effect of condition on perceived friendship improvement

A univariate analysis of variance revealed a significant main effect for perceived friendship improvement between the conditions with a large effect size, $F(2, 68) = 5.56$, $p = .006$, $\eta^2_p = .14$.[2] Post-hoc mean comparisons revealed that as expected, perceived friendship improvement was significantly higher among the RF condition ($M = 3.21$, $SD = .99$) than it was for both the SF condition ($M = 2.52$, $SD = 1.15$), $p = .01$, and the control condition ($M = 2.17$, $SD = .72$), $p = .004$. Further, perceived friendship improvement did not differ between the SF condition and the control condition, $p = .32$ at post-intervention.

Furthermore, two mixed between-within analysis of variance and a univariate analysis of variance with baseline perceived social support entered as a moderator revealed that social support did not moderate the influence of condition across time on relationship satisfaction, $F(4, 130) = 1.25$, $p = .29$, $\eta^2_p = .04$, happiness $F(4, 130) = .59$, $p = .67$, $\eta^2_p = .018$, or perceived friendship improvement, $F(2, 103) = 0.981$, $p = .91$, $\eta^2_p = .002$. This suggests that regardless of participants' initial levels of perceived social support, the intervention

---

[2] Due to the high attrition rate, analyses using all available data for participants who completed both baseline and post-intervention ($n = 109$), therefore not excluding those who did not complete 6-week follow-up, was conducted and produced the same pattern of results with similar statistically significant results, with a significant Conditions × Time interaction for relationship satisfaction, with a large effect size, $F(2, 106) = 4.69$, $p = .01$, $\eta^2_p = .08$, and a significant main effect for perceived friendship improvement between the conditions, with a very large effect size, $F(2, 106) = 6.746$, $p = .002$, $\eta^2_p = .11$.

conditions accounted for subsequent changes in overall relationship satisfaction and

perceived friendship improvement.[3]

Sensitivity analysis using multi-level modeling

Relationship satisfaction

To account for the missing data, this multi-level modeling approach recommended

Chakrborty and Gu, 2009 was employed. The model for relationship satisfaction included

intervention condition and interaction effects between intervention and time as fixed effects,

and participants as a random effect. Examination of random effects revealed that the rate of

change between participants varied significantly (Estimate = .182, SE = .08, Wald's $z = 2.32$,

$p = .026$), therefore we can reject the null hypothesis and conclude that we do need a random

intercept.

Examination of fixed effects revealed a significant Condition x Time interaction, $F(6,

127.74) = 3.14$, $p = .007$. The individual effects showed that the RF condition produced

greater increases in relationship satisfaction than the control group (reference category),

Estimate = .71, SE = .29, $t = 2.41$, $p = .017$, with no significant differences between the SF

condition and the control group, Estimate = .13, SE = .29, $t = .437$, $p = .66$. The estimates of

the effects suggest that the RF condition was associated with the highest increases in

relationship satisfaction overall, compared to the SF and control condition. There was a

significant difference in relationship satisfaction in the RF condition from Time 1 to Time 3,

---

[3] A univariate analysis of variance revealed that there was no significant difference between
participants in the relationship-focused condition ($M = 4.03$, $SD = .86$), the self-focused
condition ($M = 3.9$, $SD = .969$), and the control condition ($M = 3.59$, $SD = 1.109$) on baseline
levels of social support, $F(2, 68) = .859$, $p = .428$. Furthermore, levels of social support
remained stable across time regardless of condition, $F(4, 136) = .711$, $p = .59$.

p = 002, but not from Time 2 to Time 3, *p* = .226. Further, there was no differences from Time 1 to Time 3 (*p* = .11) or Time 2 to Time 3 (*p* = .942) in the SF condition, or from Time 1 to Time 3 (*p* = .352) or Time 2 to Time 3 (*p* = .835) in the control condition. This confirmed the findings of the mixed between- within ANOVA above.

Discussion

The purpose of this research was to assess the effects of social/ relationship-focused PPAs focused on others, versus analogous self-focused PPAs on existing social relationships and examine whether these varied by pre-existing levels of social support. To our knowledge, this is the first study to show that PPAs aimed at enhancing social relationships that are tailored specifically to others, rather than to the self, led to sustained beneficial changes to relationship satisfaction and improvement in friendships. As expected, those in the RF condition experienced a significant increase in relationship satisfaction over time, at both immediate post-intervention and six week follow-up compared to baseline, with no such effect for either the SF or the control condition.   Multi-level analysis confirmed these improvements in relationship satisfaction. Also, those in the RF condition were significantly more satisfied with their existing relationships than those in the SF condition and control condition with medium to large effect sizes evident. Additionally, perceived friendship improvement was significantly higher among the RF condition than it was for the other conditions. Moreover, regardless of participants' initial levels of social support the effects of the assigned PPAs remained the same for the observed improvements in overall relationship satisfaction and perceived friendship improvement. Thus it appears that either expressing gratitude or kindness to one's existing social relations on a regular basis over seven days can significantly improve people's satisfaction with their relationships. However, although those

in the RF condition displayed the greatest increases in happiness scores from baseline to follow-up, followed by those in the SF condition, and lastly the control condition, these differences did not reach statistical significance. Further, these associations were not moderated by initial levels of social support.

The current results are consistent with and give empirical strength to the large body of evidence revealing that gratitude appears to strengthen relationships, whilst fostering relationship satisfaction (Algoe et al., 2008). However, the present study advances research by demonstrating an important mechanism through which such PPAs have their effects, specifically showing that shifting one's focus away from the self to others will improve social relations. It is also theoretically important as it demonstrates that initial levels of social support are not necessarily needed for these changes to occur. Performing both acts of gratitude and kindness to others signalled relatively equal utility in improving relationships thus both PPAs may be exploited in future work. Albeit more research is needed to evaluate the importance of kindness in the development and maintenance of satisfying relationships, as suggest hitherto by Otake and colleagues (2006) it appears that enacting kind behaviours towards people within one's social network appears to strengthen the relationship over time, similar to gratitude. Indeed, the fundamentally social strengths of kindness and gratitude are intrinsic to strong social relations; high levels of gratitude and kindness are associated with improved relationships (Algoe et al., 2008; Emmons & McCullough, 2003), with both potentially working in a synergetic relationship with positive relationships and happiness (Otake et al., 2006). Thus it appears that fostering these strengths through directing them towards other people (through social interaction or engagement with other people) have key potential in the promotion of satisfactory relationships, a finding that others have argued is required presently to improve levels of happiness and health (Cohen & Janicki-Deverts, 2009; Kok & Fredrickson, 2013). In terms of the design of PPA interventions, these results

also suggest that the specific reflection (e.g. gratitude or kindness) may be less important than the mechanisms or processes through which the intervention has its effects (e.g. focusing on relationships versus on oneself). This breaks new ground in terms of understanding how to effectively apply PPAs in an evidence-based manner.

Furthermore, the finding that PPAs oriented towards others were effective regardless of whether the performer of the activity had high or low levels of perceived social support serves to inform the positive-activity model (Lyubomirsky & Layous, 2013), as it indicates that this is not a boundary condition for the effectiveness of the relationship focused mechanism. This is important as although research indicates that autonomy supportive environments provided by the researcher may increase intervention effectiveness (Della Porta et al., as cited in Layous & Lyubomirsky, 2012) and instructional support may hinder intervention effectiveness (Kaczmarek et al., 2014), the individual's baseline levels of perceived social support may not impede or enhance outcomes. More importantly, this finding also increases our theoretical understanding of how social support may operate in PPA effectiveness (Lyubomirsky & Layous, 2013). It suggests that initial levels of support do not seem to moderate these effects and that research efforts should concentrate on other aspects of social support such as fostering positive social interactions within existing social networks which may be more fruitful in terms of outcomes.
Additionally, although the current research did not find that relationship-focused PPAs improved levels of happiness more than the self-focused PPAs, the trend was in the desired direction. Previous studies have shown intervention impacts on happiness are distal in nature, thus more pronounced at longer follow-ups (Seligman et al., 2005). Indeed, in the interest of obtaining the weekly changes in happiness that were hypothesised to ensue following their PPAs, Seligman and colleagues (2005) created a new measure, the Steen Happiness Index, that was deemed to be particularly sensitive to upward changes in

happiness ratings over time. The measure employed in the current study (the SHS) has been depicted as an assessment which is possibly not equivalent to participants recent, more temporal affect scores or satisfaction with life (Lyubomirsky & Lepper, 1999), which may be a potential explanation for the discrepancy. Perhaps operationalizing happiness in this manner (positive affect, life satisfaction) may have resulted in different results; this also implies that PPAs designed to enhance relationships may only target specific aspects of happiness.

Research on prosocial spending offers valuable insights into the stronger benefit derived from spending or giving money to others, rather than oneself, on wellbeing and happiness and the greater benefits of helping people with whom one has strong social ties, such as family or close friends, as opposed to random people or charities (Aknin, Dunn, Whillans, Grant, & Norton, 2013). It is posited that similar pathways may apply to other types of prosocial behaviour, such as the current studies relationship-focused PPAs.

There are a number of study limitations that must be acknowledged. Although findings were of statistical significance, these results require replication. There was a very high attrition rate (68%), which is common in Internet-based studies (Wantland et al., 2004) and a final sample size of 71 participants. Although this may be viewed as relatively small, it is noted that this sample is considerably larger than most psychotherapy outcome studies (Seligman, Rashid, & Parks, 2006) and our multilevel modelling yielded similar results. Our final follow-up was relatively short-term and in order to access whether the observed positive relational changes are sustained over a longer period of time, future work must include intermediate and longer–term intervention follow-up. Furthermore, the use of single-item measures are deemed robust and reliable (Wanous & Hudy, 2001) and were applicable in this study, as the researchers were only interested in perceived changes in overall relationship satisfaction, and perceived improvement in friendships; this was because the participants

were not instructed to target their acts of kindness and gratitude to a specific individual, thus there was a possibility that they were directed at different people across discrete domains of social relationships, be it a spouse, partner, friend, sibling, child, or colleague. Vaughn and Baier, (1999) contend that although single-item global measures of relationship satisfaction are used regularly in research on family and marital relationships, they are limited in the amount of information they provide. Longer, validated scales measuring relationship satisfaction and other dimensions both within and across specific social relationships are needed to uncover what aspects of relationships are affected through these PPAs, and may produce different findings. Hence, there is ample potential for further research in this area.

Conclusion

This study appears to be the first positive psychology trial that directly compares PPAs directed at oneself versus other people, and whether baseline levels of social support impede or enhance intervention outcomes. Moreover, this was achieved through strict adherence to the CONSORT statement (Schulz et. al., 2010) which addresses the weaknesses of earlier studies (Bolier et al., 2013; Wood & Tarrier, 2010). Future researchers are encouraged to adopt a similar approach to aid the replication.. Therefore, our conclusion that such straightforward, cost-effective PPAs involving positive social interaction may potentially be harnessed to improve social relationships are promising, warrants further attention, and is certainly an advance in the desired direction. Indeed, we encourage researchers to extend on these findings to examine the role of these enhanced relationships for other health outcomes. Finally, it is advocated that further attention be paid to the specific components and mechanisms that define one PPA from another, and how interventions aimed at fostering kindness and gratitude through positive social interaction with others, can strengthen people's existing relationships and consequently their health and happiness.

References

Aknin, L. B., Dunn, E. W., Whillans, A. V., Grant, A. M., & Norton, M. I. (2013). Making a
  difference matters: Impact unlocks the emotional benefits of prosocial
  spending. *Journal of Economic Behavior & Organization*, *88*, 90-95.

Algoe, S. B., Haidt, J., & Gable, S. L. (2008). Beyond reciprocity: gratitude and relationships
  in everyday life. *Emotion*, *8*(3), 425.

Berry, D. S., & Hansen, J. S. (1996). Positive affect, negative affect, and social
  interaction. *Journal of Personality and Social Psychology*, *71*(4), 796.

Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013).
  Positive psychology interventions: a meta-analysis of randomized controlled
  studies. *BMC Public Health*, *13*(1), 119.

Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support
  may be more beneficial than receiving it results from a prospective study of
  mortality. *Psychological Science*, *14*(4), 320-327.

Buchanan, K. E., & Bardi, A. (2010). Acts of kindness and acts of novelty affect life
  satisfaction. *The Journal of social psychology*, *150*(3), 235-237.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk a new
  source of inexpensive, yet high-quality, data?. *Perspectives on Psychological
  Science*, *6*(1), 3-5.

Camfield, L., Choudhury, K., & Devine, J. (2009). Well-being, happiness and why
  relationships matter: Evidence from Bangladesh. *Journal of Happiness Studies*, *10*(1),
  71-91.

Cantwell, J., Muldoon, O. T., & Gallagher, S. (2014). Social support and mastery influence the association between stress and poor physical health in parents caring for children with developmental disabilities. *Research in developmental disabilities*, *35*(9), 2215-2223.

Chu, P. S., Saucier, D. A., & Hafner, E. (2010). Meta-analysis of the relationships between social support and well-being in children and adolescents. *Journal of Social and Clinical Psychology*, *29*(6), 624-645.

Cohen, S. (2004). Social relationships and health. *American psychologist*,*59*(8), 676.

Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. *Social support measurement and intervention: A guide for health and social scientists*, 1-25.

Cohen, S., & Janicki-Deverts, D. (2009). Can we improve our physical health by altering our social networks?. *Perspectives on Psychological Science*, *4*(4), 375-378.

Demir, M., Özdemir, M., & Weitekamp, L. A. (2007). Looking to happy tomorrows with friends: Best and close friendships as they predict happiness. *Journal of Happiness Studies*, *8*(2), 243-271.

Demir, M., Özen, A., & Procsal, A. D. (2014). Friendship and happiness. *Encyclopedia of Quality of Life and Well-Being Research*, 2359-2364.

Diener, E. (2009). *The science of well-being* (pp. 11-58). New York: Springer.

Diener, E., & Seligman, M. E. (2002). Very happy people. *Psychological science*, *13*(1), 81 84.

Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: an experimental investigation of gratitude and subjective well-being in daily life. *Journal of personality and social psychology*, *84*(2), 377.

Emmons, R. A., & Shelton, C. M. (2002). Gratitude and the science of positive psychology. *Handbook of positive psychology*, *18*, 459-471.

Fowler, R. D., Seligman, M. E., & Koocher, G. P. (1999). The APA 1998 Annual Report. *American Psychologist*, *54*(8), 537.

Froh, J. J., Kashdan, T. B., Ozimkowski, K. M., & Miller, N. (2009). Who benefits the most from a gratitude intervention in children and adolescents? Examining positive affect as a moderator. *The Journal of Positive Psychology*,*4*(5), 408-422.

Froh, J. J., Sefick, W. J., & Emmons, R. A. (2008). Counting blessings in early adolescents: An experimental study of gratitude and subjective well-being. *Journal of School Psychology*, *46*(2), 213-233.

Brand, C., Barry, L., & Gallagher, S. (in press). Social support mediates the association between benefit finding and quality of life in caregivers. *Journal of Health Psychology*.

Gallagher, S., Phillips, A. C., Ferraro, A. J., Drayson, M. T., & Carroll, D. (2008). Social support is positively associated with the immunoglobulin M response to vaccination with pneumococcal polysaccharides. *Biological psychology*, *78*(2), 211-215.

Gallagher, S., & Whiteley, J. (2012). Social support is associated with blood pressure responses in parents caring for children with developmental disabilities. *Research in developmental disabilities*, *33*(6), 2099-2105.

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: a meta-analytic review. *PLoS medicine*, *7*(7), e1000316.

Kaczmarek, L. D., Goodman, F. R., Drążkowski, D., Kashdan, T. B., Połatyńska, K., & Komorek, J. (2014). Instructional support decreases desirability and initiation of a gratitude intervention. *Personality and Individual Differences*, *64*, 89-93.

Kok, B. E., Coffey, K. A., Cohn, M. A., Catalino, L. I., Vacharkulksemsuk, T., Algoe, S. B., & Fredrickson, B. L. (2013). How positive emotions build physical health perceived positive social connections account for the upward spiral between positive emotions and vagal tone. *Psychological science*, *24*(7), 1123-1132.

Kok, B.E. & Fredrickson, B.L. (2013). Well-being begins with "We": The physical and mental health benefits of interventions that increase social closeness. In F. Huppert & C .Cooper (Eds.), *Interventions and Policies to Enhance Well-Being.*

Layous, K., & Lyubomirsky, S. (2012). The How, Why, What, When, and Who of Happiness: Mechanisms Underlying the Success of Positive Activity Interventions.

Layous, K., Nelson, S. K., Oberle, E., Schonert-Reichl, K. A., & Lyubomirsky, S. (2012). Kindness counts: Prompting prosocial behavior in preadolescents boosts peer acceptance and well-being. *PloS one*, *7*(12), e51380.

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: does happiness lead to success?. *Psychological bulletin*, *131*(6), 803.

Lyubomirsky, S., & Layous, K. (2013). How do simple positive activities increase well being?. *Current Directions in Psychological Science*, *22*(1), 57-62.

Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary

   reliability and construct validation. *Social indicators research*, *46*(2), 137-155.

McCullough, M. E., Kilpatrick, S. D., Emmons, R. A., & Larson, D. B. (2001). Is gratitude a

   moral affect?. *Psychological bulletin*, *127*(2), 249.

Mohr, D. C., Spring, B., Freedland, K. E., Beckner, V., Arean, P., Hollon, S. D., Ockene, J.,

   & Kaplan, R. (2009). The selection and design of control conditions for randomized

   controlled trials of psychological interventions. Psychotherapy and Psychosomatics,

   78, 275–284.

Myers, D. G., & Diener, E. (1995). Who is happy?. *Psychological science*, *6*(1), 10-19.

Myers, D. G. (2000). The funds, friends, and faith of happy people. *American

   psychologist*, *55*(1), 56.

Otake, K., Shimai, S., Tanaka-Matsumi, J., Otsui, K., & Fredrickson, B. L. (2006). Happy

   people become happier through kindness: A counting kindnesses

   intervention. *Journal of Happiness Studies*, *7*(3), 361-375.

Parks, A. C. (2014). A case for the advancement of the design and study of online positive

   psychological interventions. *The Journal of Positive Psychology*, 1-7.

Scherpenzeel, A. C. (1995). A question of quality. Evaluating survey questions by multitrait

   multimethod studies.

Schulz, K. F., Altman, D. G., & Moher, D. (2010). CONSORT 2010 statement: updated

   guidelines for reporting parallel group randomised trials. *BMC medicine*,*8*(1), 18.

Seligman, M. (1991). *Learned Optimism.* Sydney: Random House.

Seligman, M. E., Rashid, T., & Parks, A. C. (2006). Positive psychotherapy. *American Psychologist*, *61*(8), 774.

Seligman, M. E., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: empirical validation of interventions. *American psychologist*, *60*(5), 410.

Sheldon, K. M., & Lyubomirsky, S. (2006). How to increase and sustain positive emotion: The effects of expressing gratitude and visualizing best possible selves. *The Journal of Positive Psychology*, *1*(2), 73-82.

Sherbourne, C. D., & Stewart, A. L. (1991). The MOS social support survey.*Social science & medicine*, *32*(6), 705-714.

Shumaker, S. A., & Brownell, A. (1984). Toward a theory of social support: Closing conceptual gaps. *Journal of social issues*, *40*(4), 11-36.

Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: A practice-friendly meta analysis. *Journal of clinical psychology*, *65*(5), 467-487.

Vandervoort, D. (1999). Quality of social support in mental and physical health.*Current Psychology*, *18*(2), 205-221.

Viswesvaran, C., Sanchez, J. I., & Fisher, J. (1999). The role of social support in the process of work stress: A meta-analysis. *Journal of Vocational Behavior*,*54*(2), 314-334.

Wanous, J. P., & Hudy, M. J. (2001). Single-item reliability: A replication and extension. *Organizational Research Methods*, *4*(4), 361-375.

Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: how good are single-item measures?. *Journal of applied Psychology*, *82*(2), 247.

Wantland, D. J., Portillo, C. J., Holzemer, W. L., Slaughter, R., & McGhee, E. M. (2004).

The effectiveness of Web-based vs. non-Web-based interventions: a meta-analysis of

behavioral change outcomes. *Journal of medical Internet research*, *6*(4).

Wood, A. M., & Tarrier, N. (2010). Positive clinical psychology: A new vision and strategy

for integrated research and practice. *Clinical psychology review*,*30*(7), 819-829.

Wood, A. M., Froh, J. J., & Geraghty, A. W. (2010). Gratitude and well-being: A review and

theoretical integration. *Clinical psychology review*, *30*(7), 890-905.

Appendix

CONSORT 2010 checklist (Schulz et. al, 2010).

Section/Topic	Item No	Checklist item	Reported on page No
Title and abstract			
	1a	Identification as a randomised trial in the title	Title page
	1b	Structured summary of trial design, methods, results, and conclusions	1
Introduction			
Background and objectives	2a	Scientific background and explanation of rationale	1-6
	2b	Specific objectives or hypotheses	6-7
Methods			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	8, 12
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	n/a
Participants	4a	Eligibility criteria for participants	7
	4b	Settings and locations where the data were collected	7
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	8-9, 11
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	9. 8-11
	6b	Any changes to trial outcomes after the trial commenced, with reasons	n/a
Sample size	7a	How sample size was determined	-
	7b	When applicable, explanation of any interim analyses and stopping guidelines	n/a
Randomisation:			
Sequence generation	8a	Method used to generate the random allocation sequence	11
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	11
Allocation Concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	11
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	11
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	11

	11b	If relevant, description of the similarity of interventions	n/a
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	12
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	12
Results			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	Figure 1
	13b	For each group, losses and exclusions after randomisation, together with reasons	Figure 1
Recruitment	14a	Dates defining the periods of recruitment and follow-up	-
	14b	Why the trial ended or was stopped	n/a
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	Table 1
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	Figure 1
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	13-16
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	n/a
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	13-16
Harms	19	All important harms or unintended effects in each group	n/a
Discussion			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	19
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	7
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	17-19
Other information			
Registration	23	Registration number and name of trial registry	n/a
Protocol	24	Where the full trial protocol can be accessed, if available	n/a
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	n/a

Table 1. Baseline descriptive statistics.

	Relationship-Focused		Self-Focused		Control	
	M	*SD*	*M*	*SD*	*M*	*SD*
Age (Years)	33.3	12.07	35.3	13.56	33.1	10.84
Happiness	4.5	1.50	4.3	1.69	4.2	1.66
Relationship Satisfaction	3.4	1.14	3.2	1.11	3.3	1.03
Social Support	3.7	0.91	3.7	1.07	3.6	0.94
	n	%	*n*	%	*n*	%
Sex (Female)	58	68.2	59	62.11	26	57.78

Table 2. Pairwise comparisons for relationship satisfaction scores.

	Time a	Time b	*MD* (a-b)	*SE*	*p*	*d*	95% CI
RF	1	2	-.429	.128	.004**	0.59	[-.74, -.11]
	1	3	-.536	.146	.001**	0.69	[-.89, -.18]
	2	3	-.107	.131	1.00	0.15	[-.43, .21]
SF	1	2	-.323	.122	.03*	0.61	[-.62, -.02]
	1	3	-.258	.139	.202	0.27	[-.59, .08]
	2	3	.065	.124	1.00	0.07	[-.24, .37]
Control	1	2	.167	.196	1.00	0.16	[-.31, .65]
	1	3	.167	.223	1.00	0.16	[-.38, .71]
	2	3	0	.2	1.00	0	[-.49, .49]

Note. Data presented is based on estimated marginal means. RF = relationship-focused condition, SF = self-focused condition. Time: 1 = baseline; 2 = post-intervention; 3 = 6 week follow-up, *MD* = mean difference, *SE* = standard error, *p* = significance adjustmentt for multiple comparisons: Bonferroni, *d* = Cohen's d, CI = confidence interval for difference,* significant at p < 0.05, ** significant at p < .017.

Figure Captions

Figure 1. Summary of flow of participants adapted from CONSORT 2010 Flow Diagram

(Schulz et. al, 2010).

Figure 2. Plot of means for relationship satisfaction scores over time.

Figure 3. Plot of means for happiness scores over time