

Evaluation of an Online Self-Help Version of the *REACH Forgiveness* Program: Outcomes and Predictors of Persistence in a Community Sample

Jennifer A. Nation¹, Eleanor H. Wertheim¹ & Everett L. Worthington, Jr.²

¹ Department of Psychology and Counselling, La Trobe University, Bundoora (Melbourne), VIC, Australia

² Psychology Department, Virginia Commonwealth University, Richmond, VA, USA

In press, accepted in *Journal of Clinical Psychology* (Sept 5, 2017)

Corresponding author: Eleanor Wertheim, PhD, Department of Psychology and Counselling, La Trobe University, Bundoora, VIC, 3086, Australia

Abstract

Objectives: We evaluated outcomes of an online, self-directed REACH Forgiveness intervention for community-based adults. Since many participants dropped out before program completion, predictors of program persistence were also examined. **Method:** Participants ($N = 130$ adults, 122 female; mean age 48) completed pre-treatment assessment and were randomized to immediate treatment (IT) or delayed treatment (DT). Twenty-three IT and 13 DT participants completed the 7-hour REACH Forgiveness modules and post-intervention assessment. Thirty-two participants completed three-month follow-up. **Results:** The IT group reported greater post-intervention improvements in overall forgiveness and emotional forgiveness, and reductions in avoidance motivations with large effect sizes and, marginally, state empathy; but revenge motivations, decisional forgiveness, and wellbeing indicators did not change. Most post-intervention improvements were maintained at three-month follow-up. In this online intervention, persistence was predicted by perspective taking, willingness to forgive the offender and conscientiousness. Three-month follow-up supported maintenance of gains, particularly in overall and emotional forgiveness, and increases in trait forgiveness compared to pre-treatment. **Conclusions:** An online self-directed version of REACH Forgiveness applied in to a community sample has potential for improving forgiveness-related responses, particularly those involving emotional forgiveness. However, methods to increase program persistence and target suitable recipients need development.

Evaluation of an Online Self-Help Version of the *REACH Forgiveness* Program: Outcomes and Predictors of Persistence in a Community Sample

The ability to move on from hurtful interpersonal transgressions through forgiving an offender is associated with psychological, physiological, and social wellbeing outcomes (for a meta-analysis, see Fehr, Gelfand, & Nag, 2010). Psychologists have developed structured interventions, based upon diverse theoretical models, that have effectively reduced unforgiveness and promoted forgiveness of interpersonal transgressions (for a meta-analysis, see Wade, Hoyt, Kidwell, & Worthington, 2014) in clinical and non-clinical populations. The current study aims to extend upon a previously developed forgiveness intervention (Wade et al., 2014; Worthington, 2006) to examine its effectiveness in a community sample, using a new, completely self-guided, interactive online modality, and to examine predictors of persistence with the intervention.

The REACH Forgiveness Intervention

One of the two most-often researched interventions is the REACH Forgiveness model (Harper et al., 2014; Lin et al., 2014; for a meta-analysis and review, see Wade et al., 2014). (An equally often researched model was developed by Enright and Fitzgibbons [2014].) This model presents forgiveness as a process that takes place over time through two channels, specifically decisional forgiveness and emotional forgiveness (Worthington, Witvliet, Pietrini, & Miller, 2007). In decisional forgiveness, an individual decides to refrain from avoidant or vengeful behavior towards an offender and to treat the offender as a valuable and valued person. This decision is thought to be made more likely through clarifying what forgiveness is and is not (e.g., it is not excusing or condoning the offense), examining beliefs about forgiveness, and recounting advantages and disadvantages of forgiving (Worthington, 2006). However, deciding to forgive

will not necessarily address hurt and anger felt towards the offender. Therefore, to reach some personal peace, people need to experience emotional forgiveness, in which negative affect and cognition are replaced with more positive ones. The REACH Forgiveness approach (Worthington, 2006) was developed to address both of these processes.

In the REACH intervention, participants select an unforgiven transgression to work through and complete a self-assessment of their degree of forgiveness (Worthington, 2006). In an introduction, since misconceptions about the meaning and consequences of forgiveness are considered inhibitors of forgiveness (Blatt & Wertheim, 2015), forgiveness is defined, benefits of forgiving including better physical, psychological, social, and spiritual health are recounted, and beliefs about forgiveness are explored. Participants are then invited to make a decision to forgive. They imagine holding their grudge tightly with arms outstretched. After holding it for a while, they feel its weight and burden. They might make a decision to forgive and symbolically release the grudge and drop their arms in relief, or they might decide to revisit later their decision to forgive.

Participants then work through the five-step *R-E-A-C-H* Forgiveness process seeking emotional forgiveness for the transgression. The process begins when participants *recall (R)* the specific hurt and emotions associated with the target transgression. As developing empathy is conceptualized as a central facilitative process in forgiving (McCullough et al., 1998), participants then work to develop *empathy (E)* for the offender by understanding the other's perspective and factors that may have contributed to offenses, without condoning or excusing that behavior. Empathy (or sympathy, compassion, or unselfish love) is fostered through exercises like imagining what it must have been like for the offender, writing letters as if one is the offender, and empty-chair dialogues. Participants are invited to give an *altruistic (A)* response of forgiving the offender based upon the participant's own experiences of having been forgiven, which also fosters humility. Participants then make a *commitment (C)* to maintain the forgiveness they

experienced and to extend it. Participants might solidify the commitment through writing a certificate of forgiveness for their private viewing or through some symbolic act like burning a piece of paper on which a summary of the grudge is written. Then, participants develop cognitive-behavioral, emotional, or environmental control strategies to *hold (H)* or maintain forgiveness when reminded of their hurt or anger (Worthington, 2001; Worthington, Lavelock, & Scherer, 2012). Participants revisit the early invitation to make a decision to forgive, and if they have not done so, they might make such a decision. In a final section, forgiveness is generalized by applying the REACH Forgiveness model to up to ten other events not fully forgiven at that point and doing things like identifying heroes of forgiveness, thinking positive thoughts toward or praying for offenders (depending on participants' individual beliefs), and committing themselves to living a more forgiving life.

Meta-analyses have supported the efficacy of the REACH Forgiveness intervention in increasing forgiveness and improving wellbeing (Wade et al., 2014; Wade & Worthington, 2005). REACH Forgiveness is often offered in psychologist-facilitated group format, but it has also been investigated in psychoeducational or psychotherapy groups, couple therapy or couple meetings with relationship consultants, and individual counseling. To broaden dissemination, two recent studies evaluated the efficacy of REACH Forgiveness in a self-directed format (Greer, Worthington, Lin, Lavelock, & Griffin, 2014; Harper et al., 2014). A workbook was supplied online for students who chose to complete the assessments and workbooks within two weeks to fulfill a course research participation requirement. By using benchmarking that drew on many studies using psychoeducational groups, Greer et al. suggested this self-directed workbook approach was at least as effective as facilitated group formats that also used student participants (Greer et al., 2014; Harper et al., 2014).

Forgiveness Correlates and Intervention Outcomes

Typical associations with forgiveness. Specific offense-targeted forgiveness and forgivingness are associated with a range of related characteristics. Consistent with the theorized role of empathy, a meta-analysis by Fehr and colleagues (2010) found that forgivingness was associated with empathic concern ($r = .17$) and state forgiveness was related to state empathy ($r = .51$). They also found forgiveness was associated with less depression ($r = -.26$). In a qualitative review, Worthington, Griffin, and Provencher (2017) reviewed relationships between forgiveness and wellbeing. They found substantial relationships predicting physical and psychological wellbeing, relational wellbeing, and spiritual wellbeing, typically involving lesser depression, anxiety, stress, and other mental health symptoms (as well as relationship-related and spirituality-related connections).

Interventions often stimulate forgiveness plus changes in depression, stress, and anxiety. Wade et al. (2014) meta-analyzed forgiveness interventions delivered in psychoeducational groups or individual counseling or consultations with both clinical and non-clinical populations. Forgiveness interventions ($k=53$) were efficacious when compared with no treatment ($\Delta+ = .53$) or alternatives ($\Delta+ = .45$). There was a linear dose-response relationship that held across all intervention models of about 0.1 SD per hour of treatment. Wade et al. also found that the studies of forgiveness interventions not only promoted forgiveness relative to untreated controls, but typically also resulted in reduced depression ($k=10$; forgiveness $\Delta+ = .60$; depression $\Delta- = 0.34$) and anxiety ($k=7$; forgiveness $\Delta+ = 1.34$; anxiety $\Delta- = 0.63$), even though forgiveness interventions usually do not discuss depression or anxiety. Similarly, a recent forgiveness and wellbeing meta-analysis (Akhtar & Barlow, 2016), found a small effect for depression ($N = 415$, $SMD = -0.37$), and larger effects for subjective stress and distress ($N=267$, $SMD = -0.66$) and anxiety $N = 78$, $SMD = -1.13$. Forgiveness interventions can also contribute to increases in dispositional forgivingness (Wade et al., 2014).

Theories of how interventions promote changes. There are many theoretical explanations of how forgiveness interventions promote forgiveness, empathy, and wellbeing (Worthington et al., 2017). The REACH model is often linked to stress-and-coping theory (Strelan & Covic, 2006; Worthington, 2006), in which forgiveness is viewed as a coping response to the stress resulting from a hurtful offense. In that theory, people are motivated to practice helpful emotion-based, cognitive-change, and environmental-manipulation coping mechanisms to enhance their emotional experience of forgiving and thus reduce the stress of unforgiveness. Consistent with this model Toussaint, Shields, and Slavich (2016) assessed 332 community-based people weekly for five weeks. They found that levels of state forgiveness, perceived stress, and mental and physical health symptoms each showed significant change and individual variability in change over time. A time sequence unfolded. Increases in forgiveness were associated with decreases in stress, which were in turn related to decreases in mental (but not physical) health symptoms. The reverse effects model that health increases were related to stress decreases and yielded forgiveness was not a good longitudinal fit.

Other theories of forgiveness interventions include that of Enright and Fitzgibbons (2014), who use a process model that includes interventions to change cognition, affect, and behavior. Worthington et al. (2017) have also put forth a prolonged exposure theoretical account, which is similar to the prolonged exposure accounts in treating posttraumatic stress disorders (Foa, McNally, & Williams, 1996). This latter model, as well as Wade and colleagues' (2014) findings of dose-response effects, indicate the need for interventions of at least five or six hours, and longer if possible.

Personally Administered Forgiveness Interventions

Varieties of self-help interventions. Appropriately targeted, evidence-based, self-directed interventions for psychological problems represent important alternatives to psychotherapist-based individual care (Kazdin & Rabbitt, 2013). Self-help interventions are

recommended initial treatments where problems are causing moderate distress and access to specialist practitioners is limited (Lovell, Richards, & Bower, 2003), as adjuncts to psychotherapy when problems are complementary to the goals of psychotherapy, and as ways of preventing forgiveness-related problems or enhancing one's life through psychoeducation.

There are many ways to administer self-help interventions. In a forgiveness self-help bibliotherapy approach, Graham, Enright, and Klatt (2012) had six adult children of divorce read a popular book on forgiveness and compared them to six others who read a book on having difficult conversations. Of the 12 participants, two were students and ten were community adults (aged 20 to 40). The intervention provided a 12-week guide with weekly emails about the assigned weekly readings to complete the book and to do so while reflecting about a target transgression by mother or father. In some ways, despite the small *N*, the bibliotherapy was more efficacious than the control. Although this format provided self-help intervention, it required weekly monitoring.

In two workbook-format forgiveness studies, Harper et al. (2014) and Greer et al. (2014) had students work through a 6- to 7-hour workbook on forgiving a person of their choice (although Greer et al. specified that the Christian respondent select another Christian from the respondent's own congregation as the target for forgiveness). Students received credit for participating. People were selected and assigned to a waiting list or intervention for completion within two weeks. One reminder by a relevant class professor was given at the end of week one and another at the end of week two prior to when the course requirement of completing a research study was due. While these interventions were successful in increasing forgiveness, conditions for a study that is conducted in a university for course credit versus a completely volunteer, community intervention are different. Therefore, the current study examined outcomes in a community sample, while trialing a new, interactive internet-based approach to delivering the REACH intervention.

Varieties of types of online interventions. Consumers and providers value internet-provided mental health information and interventions for their low cost, 24-hour availability, anonymity, and ease of remote access (Ybarra & Eaton, 2005). All internet interventions are not the same, however (Christensen, Griffiths, & Farrer, 2009). Online interventions exist along a continuum of attention required by the website operator—from minimal attention (i.e., simply making the site available in open access), through periodic check-ins and personal encouragement to continue, to full availability of mental health counselors on demand. To maximize participation, such interventions often are brief (sometimes only several hours), offer sound and video elements, include individualized interaction, and employ automated reminders about participation.

The present study evaluated an online internet-based version of the REACH Forgiveness intervention program with content parallel to past REACH Forgiveness online-accessible self-help workbook interventions, maintaining the (approximately) six-hour format. However, consistent with many online interventions (Kelders, Kok, Ossebaard, & Van Gemert-Pijnen, 2012), instead of simply providing downloadable workbook chapters, all content was provided directly on a website, interspersed with interactive activities that were completed directly into a webpage, links to video clips were inserted at key points, and automated individualized feedback was provided for some participant responses. Furthermore the approach taken was a minimal operator input approach (and thus potentially low cost), in which participants completed online modules without planned interactions with the experimenter (except for reminders if participant engagement waned).

Responses to and Persistence with Online Interventions

Meta-analytic studies have found internet-based psychotherapeutic interventions to be effective (Barak, Hen, Boniel-Nissim, & Shapira, 2008; Griffiths, Farrer, & Christensen, 2010).

Barak et al. (2008) found an overall mean weighted effect size (Hedges & Olkin, 1985) across all

92 studies and all measures of $g = 0.53$ (comparable to but a bit smaller than face-to-face psychotherapy). However, internet-based interventions commonly have relatively high levels of drop-out, with half of participants in community samples typically dropping out (Christensen et al., 2009; Kelders et al., 2012). Therefore, considering factors which predict persistence is crucial.

Characteristics of the intervention and therapeutic relationship and persistence.

Typically, characteristics of the intervention and therapeutic relationship have accounted for variance in persistence. Alfonsson, Olsson, and Hursti (2016) found applying external pressure to participate in treatment resulted in lower efficacy due to dropout and less responsiveness even if the participant continued. Treatment credibility, on the other hand, predicted patient adherence and symptom improvement after treatment. Alfonsson et al. suggested that if people find a treatment interesting and engaging, they tend to carry through with the intervention and complete prescribed assignments.

Thus, to maximize participation, good online interventions should be (a) inviting instead of feeling like the person is being pressured to participate, (b) interesting and engaging, perhaps offering sound and video elements, (c) be scientifically credible, (d) include individualized interaction, and (e) employ reminders about participation. We have attempted to incorporate these elements in our intervention's design (Alfonsson et al., 2016).

Personal variables and persistence. Personal variables, including demographic characteristics, have been shown to affect patients' persistence with Internet-based psychotherapy. In a meta-analysis of internet-based treatments, Karyotaki et al. (2015) found that lower educational level increased risk of dropping out, while older age was related directly to persistence with treatment. Affect-related symptoms have also been found to predict adherence, with Farrer, Griffiths, Christensen, Mackinnon, and Batterham (2014) finding that lower baseline depression resulted in more adherence to treatment, perhaps due to less depressed individuals having more energy to maintain motivation and complete non-essential activities.

A further approach to predicting adherence is to examine the role of personality. Of the Big Five personality factors (McCrae & Costa, 2003), conscientiousness has most consistently been related to engaging in health-promoting behaviors (see Bogg and Roberts, 2004, meta-analysis), of which forgiveness could be considered an example (Strelan & Covic, 2006; Worthington, 2006), and greater conscientiousness also predicts adherence to medical treatment (Axelsson, 2013; Stilley, Sereika, Muldoon, Ryan, & Dunbar-Jacob, 2004; Hill & Roberts, 2011). These relationships may reflect conscientious people being more influenced by long-term consequences of their behaviors and upholding social norms (Bogg & Roberts, 2004).

Forgiveness-related and perspective taking variables as predictors of persistence with forgiveness interventions. It might also be expected that participants with traits that are consistent with the ideas presented in the REACH Forgiveness intervention, such as pre-existing trait forgivingness, would be more likely to persist with an intervention that fits with their views. Similarly, people with trait perspective taking tendencies, a core aspect of REACH (Worthington, 2001), are likely to be less resistant to completing exercises asking them to see the viewpoint of the offender. Further, at the outset selecting an offense and offender one is willing to try to forgive may result in greater persistence with a forgiveness intervention designed around forgiving that offender.

We investigated the efficacy of a potentially low operator-input, and thus low-cost, intervention. Because our intervention was one with minimal monitoring, prompting, and reminders, more drop out was anticipated than in interventions with more active operator input. We therefore investigated factors that might predict adherence to our minimally monitored online intervention.

Aims and Hypotheses

Main hypotheses. Our main aim was to examine outcomes of our newly developed online, interactive, self-help format for the REACH Forgiveness intervention. While the intervention content utilized has been previously found to be effective in face-to-face formats, and self-help workbook versions have been efficacious with university students, we tested outcomes using a new, potentially cost-effective, online intervention format in a community sample. We hypothesized (H1) that an immediate treatment (IT) group would report greater pre- to post-intervention (Time 1, T1; to Time 2, T2) increases in state forgiveness, emotional and decisional forgiveness and empathy, and reductions in revenge and avoidance motivations towards an offender than for a delayed treatment (DT). We also hypothesized greater decreases in depression, subjective stress and anxiety than DT. Furthermore, we hypothesized (H2) that state forgiveness and empathy would be higher, and unforgiveness, depression, subjective stress and anxiety lower, at T2 and three-month follow-up (Time 3; T3) than at baseline (T1) with no significant differences between T2 and T3 (i.e., maintenance would be achieved). We also explored whether trait forgivingness and trait empathy would increase from T1 to T3.

Hypotheses related to persistence. Because we anticipated substantial attrition due to the online, self-directed, and minimally actively-supported nature of the intervention (Christensen et al., 2009; Kelders et al., 2012), we advanced hypotheses related to predictors of persistence with the program. We examined demographic variables previously found to influence intervention adherence (Karyotaki et al., 2015), relevant person variables, and willingness to forgive the target offender. Specifically, after accounting for the predictiveness of higher age and education level, it was hypothesized that conscientiousness, depressive symptoms, trait forgivingness, trait perspective taking, and willingness to forgive would predict persistence with the online REACH Forgiveness program.

Method

Participants

Initially, 130 adults (122 female) aged 18 to 75 ($M = 48.04$, $SD = 13.98$) from the community responded to advertisements for an online forgiveness study, completed preliminary T1 measures, and consented to the intervention. Participant flow is described in Figure 1, the CONSORT flow chart. Seventy-nine participants were allocated to immediate intervention and 51 to a delayed treatment (wait-list) condition. At T2, the post-treatment intervention $n = 23$, wait-list $n = 40$. Participants were mainly Australian residents (94.6%), most identifying as Anglo-Australian (75.4%) or European (14.6%), and 86.9% completed post-high school education, with 66% indicating a religious affiliation.

Design

The study utilized a randomized controlled trial design comparing post-intervention outcomes for an immediate treatment group (IT) with a delayed (wait-list) treatment control (DT). Using Campbell and Stanley's (1966), the following schematic depicts timepoints for each group's observations: O_D = Demographic assessment, O_{T1} other variables at T1, X represents the intervention and other O_T later assessments:

Immediate Treatment: $O_D O_{T1}$ X O_{T2} --- three months --- O_{T3}

Delayed Treatment: $O_D O_{T1}$ O_{T2a} X O_{T2b} --- three months --- O_{T3}

Replicating previous REACH Forgiveness workbook studies (Greer et al., 2014; Harper et al., 2014), participants were allocated to groups randomly; however, IT and DT participant pairs were yoked to control for time elapsed between pre- and post-assessments completed by IT participants. When IT participants appeared to have dropped out, DT participants who were yoked to them, were prompted to do the post-assessment. The number of intervention to delayed treatment participants yoked varied between 1:1 and 2:1 depending on prior intervention participation completion rates. Once DT participants completed Time 2a

assessment, they could undergo the intervention and complete post (T_{2b}) and three-month follow-up (T₃) measures.

Assessment Instruments

Trait and dispositional measures. Several dispositional measures (as follows) were assessed at T1. Trait forgiveness and trait empathy were also assessed at T3.

Demographics. Participants self-reported demographics and the following information.

Trait Forgivingness Scale (TFS; Berry, Worthington, O'Connor, Parrot & Wade, 2005). The 10-item TFS assessed tendency to forgive others across situations and time. Items including "I can usually forgive and forget an insult" were rated from 1 (*strongly disagree*) to 5 (*strongly agree*), higher scores indicating greater forgivingness. Estimated temporal stability and evidence for construct validity have been established (Berry et al., 2005). Our study Cronbach's $\alpha = .80$.

Interpersonal Reactivity Index (IRI; Davis, 1980). Two subscales of the IRI were included: *perspective taking*, the tendency to adopt the psychological viewpoint of others; and *empathic concern*, involving affective responses such as other-oriented compassion. Items such as "I would describe myself as a pretty soft-hearted person" were rated from 1 (*does not describe me well*) to 5 (*describes me very well*) (Davis, 1980). Higher scores indicate greater trait empathy. Estimated internal consistency and test-retest reliability of scores were presented (Davis, 1980). Evidence supporting the subscales' construct validity include high correlations with cognitive and emotional empathy measures (Davis, 1983). Our sample's Cronbach's alpha for perspective taking was .78 and for empathic concern was .74.

Conscientiousness Factor of the International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006) Short Form. The Conscientiousness subscale from the

Mini-IPIP assessed that personality factor. Participants rated four items regarding how they generally see themselves from 1 (*very inaccurate*) to 5 (*very accurate*). The subscale mean (after some reverse coding) was calculated. The Mini-IPIP has shown similar patterns of convergent, discriminant and criterion validity to other Big Five measures (Donnellan et al., 2006). In our sample, Cronbach's alpha was .65 which is adequate for a four-item scale..

Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995a, 1995b). To assess the intervention's impact on mental health, we assessed wellbeing multiple times by administering the DASS-21. Participants rated items such as "I felt down-hearted and blue" from 0 (*did not apply to me at all*) to 3 (*applied to me very much of the time*) regarding the previous week. Higher summed (doubled as per standard scoring) subscale scores indicated more symptoms. Evidence supporting convergent and discriminant validity has been adduced (Antony, Bieling, Cox, Enns, & Swinson, 1998; Brown, Chorpita, Korotitsch, & Barlow, 1997). While participants completed all scales, due to multi-collinearity between anxiety and stress ($r = .78$) and anxiety being strongly skewed, we retained for analyses only stress, Cronbach's alpha = .89, and depression, alpha = .91.

Transgression description. Participants described an event (at T1) in which someone they knew did something that offended or hurt them, or treated them unfairly, for which they had not completely forgiven them and were still feeling resentful, hurt, or angry. Participants indicated their relationship with the offender, time since the transgression, and offense severity rated 1 (*not at all*) to 10 (*extremely*).

Willingness to forgive. Participants rated *willingness to forgive* the offender (single item) from 1 (*no desire to forgive*) to 10 (*wish I could forgive*).

Transgression-specific outcome measures (assessed multiple times). Several measures of different aspects of forgiveness were assessed across time points. State empathy towards the offender was also assessed multiple times.

Rye Forgiveness Scale (RFS; Rye et al., 2001). The RFS measured state forgiveness towards the offender. Participants rated items such as, "I feel resentful toward the person who wronged me" from 1 (*strongly disagree*) to 5 (*strongly agree*). For scale totals (after reversals); higher scores indicate greater forgiveness. Rye et al. (2001) adduced evidence supporting internal reliability, temporal stability and construct validity of scores. In our sample, α was .83.

Emotional and Decisional Forgiveness Scales (Worthington, Hook et al., 2007). The Decisional Forgiveness Scale (DFS) assessed intention to behave less negatively and more positively towards the offender. The Emotional Forgiveness Scale (EFS) assessed having replaced negative other-oriented emotions with positive ones. Participants rated items (sample DFS: "If I see him/her I will act friendly"; EFS: "I care about him/her") from 1 (*strongly disagree*) to 5 (*strongly agree*) with some items reverse scored. Calculating scale totals, higher scores indicated greater forgiveness. Estimated internal reliability and test-retest reliability of scores were reported by Worthington, Hook et al. (2007). Evidence supporting construct validity included correlations with established measures of forgiveness-related constructs. In our sample, alphas were satisfactory for 8-item scales, DFS $\alpha = .72$, and for EFS $\alpha = .87$. In Worthington, Hook et al. (2007), an active grudge condition reported means of 25.17 on DFS and 19.61 on EFS.

Transgression Related Interpersonal Motivations Inventory (TRIM; McCullough & Hoyt, 2002; McCullough et al., 1998). The TRIM was used to assess offender-targeted unforgiving motivations including *revenge* (TRIM-R; e.g., "I'm going to get even") and *avoidance* (TRIM-A; e.g., "I avoid him"). Participants rated items from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher mean scores indicated more unforgiving motivations. Construct validity has been supported by correlations with relationship-specific and offense-specific variables (McCullough et al., 1998). In our sample, $\alpha = .80$ for TRIM-R and $\alpha = .90$ for TRIM-A.

State empathy. The five empathy items of Batson's Empathy Scale (BES; Coke, Batson, & McDavis, 1978) measured current (state) affective empathy for the offender.

Participants rated from 1 (*not at all*) to 6 (*extremely*) how much adjectives such as *warm* or *concerned* described feelings for the offender. Higher mean scores indicated more empathy. In our sample, $\alpha = .93$.

Understanding of forgiveness definitions. To provide a manipulation check, at T2 (post-intervention), we included seven items. These measured understanding of REACH Forgiveness-relevant forgiveness processes and definitions from the REACH Forgiveness workbook (Worthington et al., 2012). Participants rated from 1 (*strongly disagree*) to 5 (*strongly agree*) how much statements such as “excusing the person from punishment” represented forgiveness. High mean scores reflected agreement with REACH-Forgiveness-consistent concepts. Cronbach’s alpha ($n=62$) was .71.

Online REACH Forgiveness Intervention

The REACH Forgiveness self-help workbook (Worthington et al., 2012), which had been shown to be efficacious in do-it-yourself workbook format (Greer et al., 2014; Harper et al., 2014), was adapted for interactive online delivery. The online version included the six modules, covering making a decision to forgive and each of the five (R-E-A-C-H) components of emotional forgiveness that were described earlier. We also included the generalization section of the workbook but in our web-based version it was described as “optional.” Nonetheless, most (27 of 36 intervention completers) worked through that section. Online REACH Forgiveness was accessed through a participant-access website that included REACH Forgiveness background, online participation tips, and access to intervention materials. (We described intervention content in the introduction to the present article.)

Importantly, there was minimal professional or layperson input after starting the study. Participants worked through REACH Forgiveness completely independently except for the researcher responding to technical or clarification-focused queries. Qualtrics Survey Software displayed modules, including videos, audio-recorded exercises, and customized display of

questions and intervention elements. Downloadable handouts and participants' written exercise transcripts were accessible. The questionnaire and online REACH Forgiveness intervention was pilot tested on five participants, who provided feedback. Minor amendments were made. This type of online intervention provides a minimalist approach to dissemination, which has the advantage of low cost but which has been shown to result in substantial attrition (Gellatly et al., 2007; Spek et al., 2007; but see also Griffiths et al., 2010).

Procedure

La Trobe University Human Ethics Committee approval was received. Participants were invited into a study called the Learning Forgiveness Project accessed through a Qualtrics survey link. Recruitment sought adults wanting to learn to be more forgiving or forgive a specific transgression. We posted advertisements on university, church and community noticeboards, websites, emails, and used a social-network snowball method. On providing informed consent, for pre-treatment (T1) measures, participants completed demographic, dispositional and wellbeing measures. They then described a transgression of moderate hurtfulness and completed associated state forgiveness measures. After completing T1 measures (which included several additional measures not reported here), participants proceeded to online REACH Forgiveness and were randomly allocated by automated Qualtrics software to IT or DT conditions. Due to higher anticipated IT dropout, we stipulated that the proportion of cases allocated to IT was more than to DT.

Participants completed online REACH Forgiveness at their own pace in multiple sessions, estimated to take on average six hours. Standardized email reminders were sent when participants had not accessed the program for seven days.

After completing the intervention, IT participants were directed to post-intervention measures (T2), assessing state forgiveness, state empathy, wellbeing, and manipulation check. DT participants, after a comparable wait time, completed T2a measures and were invited to

begin online REACH Forgiveness, which they completed at their own pace. After intervention completion, DT participants again completed outcome measures (T2b).

Three months after intervention completion, participants were emailed a link to access follow-up measures (T3), including all outcome measures and the TFS and IRI. Participants received A\$15 reward vouchers for completing post-treatment and follow-up surveys.

Data Analyses

Post-intervention outcome analyses were conducted for all participants who completed T2 measures. Condition (IT, DT) x time (T1, T2) within-subjects ANCOVA analyses were conducted. Covariates were severity, willingness to forgive, perspective taking and trait forgivingness measured at baseline. Interaction effects were the focus of the analysis. For significant interactions, post-hoc one-way within-subjects ANCOVA analyses examined differences between IT and DT conditions on the T2 dependent variable of interest, covarying T1 outcome variable score and covariates noted above. To protect against Type II error, a family-wise Bonferroni adjustment of $\alpha = .006$ was used for ANCOVAs for each of the pre-post analyses and follow-up analyses. A hierarchical regression was conducted to predict persistence with REACH modules, entering age and education in step one and the five hypothesized predictors of program persistence at step two.

Cohen's *d* effect sizes were considered small = .20, medium = .50, or large = .80 (Cohen, 1988). Given the small proportion of men participating, all analyses were repeated with women only; significant findings were all replicated. To provide the most comprehensive data, the findings in the full sample are described in this paper; however, illustrative analyses for the female only subsample are included in tables.

Results

Preliminary Analyses

Missing item values (< 5% of participant data and randomly spread) were addressed by casewise substitution of subscale mean. Univariate outliers were trimmed (Tabachnick & Fidell, 2013), including two cases for empathic concern and one case for revenge. To address skewness, square root or reflected log10 transformations were applied where noted for depression, revenge, and offense severity.

Sample Characteristics

In Figure 1, we summarize participant flow. Following initial measure completion, 130 participants agreed to the intervention. Of those randomized to condition, 63 (48%) completed measures at Time 2(a), including 23 intervention (21 female) and 40 wait-list (39 female) participants. For follow-up analyses, the 23 IT intervention completers were combined with 13 DT participants who subsequently completed the intervention, giving a “completers” sample of $n = 36$. Of these, 32 completed three-month follow-up (89% retention). Compared to DASS-21 norms (Lovibond & Lovibond, 1995a), this was a primarily normative sample; and of the randomized participants, based on DASS-21 indicative cut-offs, 73% would be categorized as reporting no stress, 8.0% mild stress, and 19.1% moderate or severe stress; 64.6% no depression, 7.6% mild depression, and 27.8% moderate or severe depression. There was no significant difference in the number of days elapsed between pre-treatment and post-assessment between the IT group, mean = 20.43 days, $SD = 15.89$, and DT group, mean = 24.80, $SD = 14.88$; $t(61) = -1.09, p = .278$.

Post-Intervention Preliminary Analyses

Attrition analyses. Independent samples t -tests and Chi-square tests compared T1 scores for completers (i.e., participants who completed T2 measures; $n = 63$) versus non-completers (participants who consented to the intervention but did not complete T2 measures; $n = 67$). At T1 completers scored higher on emotional forgiveness, $t(128) = -2.03, p = .044$; decisional forgiveness, $t(128) = -3.07, p = .003$; state empathy, $t(128) = -2.16, p = .033$; and age

$t(128) = -2.37, p = 0.019$; and lower in revenge motivation, $t(128) = 2.66, p = .009$, than did non-completers.

Independent samples t -tests comparing participants who did not start REACH Forgiveness ($n = 17$) with starters who entered Module 1 ($n = 62$) showed no significant differences ($p > .05$) on any predictor variable.

Treatment fidelity and manipulation check. The Qualtrics system indicated time spent logged into REACH modules. Number of words typed completing modules was calculated. Mean time to complete all modules was 6.63 ($SD = 4.96$) hours (cf., typical REACH Forgiveness dose of 7.02 hours was found for a workbook study; Harper et al., 2014) for the 23 completers in IT. Mean words typed across modules was 3,700, range = 644 to 7637, which was comparable to published workbook REACH Forgiveness studies (Greer et al., 2014, 3,471; Harper et al., 2014, 4,136). At T2, the IT group demonstrated greater understanding of forgiveness definitions than did the DT group, $t(60) = 2.20, p = .031, d = 0.55$. After completing the intervention, 92% of participants agreed that REACH Forgiveness had helped them.

Potential covariates. Several T1 variables were identified as covariates for main analyses. Initial differences were found between IT ($n = 23$) and DT ($n = 40$) participants who completed T2 measures. The IT group reported greater offense severity, $t(61) = 2.46, p = .017$, willingness to forgive, $t(61) = 4.75, p < .001$, trait forgivingness, $t(61) = 3.04, p = .003$, and perspective taking $t(61) = 2.55, p = .013$. Where these variables also correlated significantly with outcome variables, they were entered as covariates in relevant analyses.

Post-intervention Outcomes

A series of condition (IT, DT) by time (T1, T2) mixed between- and within-subjects analyses of covariance (ANCOVA) were conducted with T1 offense severity, willingness to forgive, trait forgivingness and perspective taking included as covariates. (We analyzed without covariates and found the same results.) Interaction effects tested the hypotheses. As shown in

Table 1, there were significant interaction effects (Bonferroni adjusted α of .006) for state forgiveness, emotional forgiveness, and avoidance, $p < .001$, with large effects, and a non-significant tendency for state empathy, $p = .012$, $d = 0.70$, with a medium effect; but IT and DT did not differ significantly on decisional forgiveness, revenge, stress or depression.

Post-hoc one-way ANCOVAs compared groups at T2, controlling for covariates and outcome measure T1 scores. IT participants reported greater improvements in state forgiveness (Rye et al., 2001), $F(1, 56) = 41.89$, $p < .001$, $d = 1.74$; emotional forgiveness, $F(1,56) = 17.46$, $p < .001$, $d = 1.12$; and avoidance, $F(1,56) = 16.13$, $p < .001$, $d = 1.06$, than did DT participants. State empathy resulted in $F(1, 56) = 8.42$, $p = .005$, $d = 0.77$, a medium effect.

Maintenance of Treatment Gains at Three-Month Follow-Up

Follow-up analyses were conducted on combined IT and DT participants who completed REACH Forgiveness and post-intervention outcomes plus three-month follow-up measures. Standardized residual change scores were calculated for outcome variables for T1-T2, T1-T3 and T2-T3. Independent t -tests comparing participants allocated to IT ($n = 20$) versus DT ($n = 12$) revealed no significant group differences on any outcome variable change scores, $t(30) < 2.00$; $p > .05$), so groups were combined (total $n = 32$). As we show in Table 2, repeated-measures ANOVAs indicated a significant time (T1, T2, T3) effect in expected directions for overall state forgiveness, emotional forgiveness, decisional forgiveness, avoidance and state empathy, but not stress, depression or revenge. Pairwise comparisons comparing scores across time points indicated significant (Bonferroni-adjusted $p < .006$) differences for T1-T2 and T1-T3 and no differences ($p > .728$) for T2-T3 for state forgiveness and emotional forgiveness suggesting post-treatment gains were maintained at follow-up. Avoidance motivation also decreased significantly ($p < .006$) from T1 to T2, with no differences between T2 and T3, but the change from T1 and T3 only approached significance ($p = .014$), although the effect size was medium ($d = .788$). Although decisional forgiveness and state empathy scores increased from T1 to T2 with no

significant decline from T2 to T3, the T1-T3 difference was not significant, suggesting a tendency towards reversion to pre-treatment level.

Trait forgivingness scores increased significantly between T1 (mean = 32.13, SD = 7.64) and T3 (mean = 36.03, SD = 6.65), $t(30) = -3.88$, $p = .001$, $d = 1.39$. There was no significant increase for trait perspective taking, $t(30) = -1.94$, $p = .062$, $d = .70$, a medium effect, or trait empathic concern, $t(30) = -0.61$, $p = .544$, $d = .219$.

Analyses Related to Program Persistence

Patterns of persistence. Of the 62 participants who started REACH, 37% completed the intervention. Of the 39 non-completers, 14 (35.8%) dropped out part way through module 1. Subsequently 19 of the non-completers (48.7%) failed to return after completing full modules (2 to 6 participants dropped out after each module), with only six (15.4%) dropping out part way through a module.

Predictors of persistence. Participants who started REACH Forgiveness ($n = 62$), were included in a hierarchical multiple regression predicting persistence (number of online modules completed). As shown in Table 3, at step one, neither age nor educational level, significantly predicted persistence, $F(2, 59) = 2.07$, $p = .135$, $Adj R^2 = .034$. At step two, entering conscientiousness, trait forgiveness, perspective taking, depression, and willingness to forgive, the step was significant, $F(5, 54) = 6.30$, $p < .0005$, $R^2\Delta = .344$, $Adj R^2 = .334$. Willingness to forgive, $p = .001$, perspective taking, $p = .006$, and conscientiousness, $p = .021$, were significant ($p < .05$) all with large effects ($r_{sp} > .26$, Cohen, 1988).

Discussion

This study of adult, largely middle-aged community members supported the efficacy of a newly developed online version of the REACH Forgiveness program in improving overall state forgiveness, emotional forgiveness and avoidance motivation, with a non-significant tendency with medium effect size for increased state empathy, in participants who completed the

program when compared to a wait-list control group. These findings are in line with the findings from Wade et al.'s (2014) meta-analysis. However, no pre-post improvements were observed in revenge motivations or decisional forgiveness (cf. Wade et al.). This pattern at least partly reflects lower levels of the latter characteristics at pre-intervention compared to characteristics for which there was change over time. Notably the pre-treatment mean for decisional forgiveness was high (30.82) relative to an active grudge condition in a normative sample ($M=25.17$; Worthington, Hook et al., 2007). In contrast, emotional forgiveness was still a major challenge at pre-treatment ($M = 19.54$) and comparable to having an active grudge in the normative sample ($M=19.61$). Emotional forgiveness increased substantially by post-intervention ($M=27.39$).

Significant pre-post improvements in the RCT were also not observed in depression and stress symptoms in this community sample. While these results contrast with significant findings in prior meta-analyses, our effect sizes were not substantially different from prior studies: our sample depression $d = 0.20$, Wade et al. (2014) $d = 0.34$, Akhtar and Barlow (2016) $d = 0.37$, all small effects; our sample stress $d = 0.43$, Akhtar and Barlow meta-analysis stress $d = 0.66$.

At three-month follow-up, participants who completed the program maintained gains in state forgiveness, emotional forgiveness and, to a lesser extent, avoidance motivation from post-intervention to three-month follow-up (which is comparable to meta-analytic findings; Wade et al., 2014). For the full sample of completers, a non-significant tendency for post-intervention gains in state empathy was found (with a large effect found in the pre-post RCT analyses) but follow-up findings suggested this was not a long-term effect. At follow-up compared to pre-intervention, program completers reported significant, large increases in trait forgiveness scores (which have been found previously; Lampton, Oliver, Worthington, & Berry, 2005) and a tendency for greater perspective taking (Lampton et al., 2005; Worthington et al., 2015). However, trait follow-up findings need to be replicated in research including a control group.

While outcomes for individuals who completed the program were promising in relation to enhancing overall and emotional forgiveness, retention rate (29% of those assigned to immediate treatment, 37% of those who started the intervention) was lower than in past REACH Forgiveness workbook studies (Greer et al., 2014 = 76% retention; Harper et al., 2014 = 100% retention) and in a REACH-Self-Forgiveness workbook study (Griffin et al., 2015 = 71%). All three previous studies included undergraduate students who received all course-required research participation credits for study completion. Drop out from internet-based treatment in the wider market of community adults is a common problem, with average treatment adherence rates around 50% (Christensen et al., 2009; Kelders et al., 2012). Adherence in our study was only 60 percent of the average (74% if only including those who started the first module). However, Kelders et al. (2012) noted in their review of online treatments that the healthcare problem mattered. More serious problems elicit more adherence. Additionally, in Kelders et al. (2012) participants interacted briefly only once per week for ten weeks and support was provided including updates, interactions with an online counselor and the system, and peer support. The strongest predictors of adherence were more frequent counselor interactions, intended usage and updates, and employment of dialogue support. Thus, the most effective online programs typically employ hours of support. In our intervention, to the contrary, no substantive interaction with counselor, peer, or system dialogue was used. Not surprisingly, our maintenance-free online self-help REACH Forgiveness intervention had less adherence than programs for life-threatening healthcare issues, and those with full-time staffing of peers, counselors, and lay programmers reacting to user demands. But, it also was far less costly.

Cost-effectiveness is an important consideration in designing interventions. Persistence rates depend directly on how much input website operators provide (Kelders et al., 2012). However, costs rise proportionately to operator input, thus cost-benefit maximization requires finding a sweet spot of minimal amount of attention of the website operator to produce an acceptable maximum amount of effect. This suggests that a cost-benefit analysis is needed by

organizations that seek to develop and use online interventions, and the priorities of the organization are vital in the type of intervention used.

It is still important, however, even with a low-cost online intervention, to seek to obtain maximum outcomes for the given costs. For this reason, it appears essential to properly target potential recipients of self-directed online-REACH Forgiveness and consider providing additional (e.g., therapist- or peer-assisted) support for some individuals. We therefore attempted to advance the field by examining predictors of persistence. Analyses of which participants persisted with the program suggest that better candidates for this self-guided online approach would be individuals who at pre-program are already more prone to take others' perspectives and reported greater willingness to forgive the target offender. While these participants might at first consideration be those who least need the intervention, the distinction between decisional and emotional forgiveness is relevant here (Worthington, Witvliet et al., 2007). Participants who engaged in the program may already have taken a first step towards forgiveness by deciding to forgive; however, their emotional forgiveness scores indicated they still needed much support in releasing the anger and distress associated with the offense, which did improve substantially following the intervention.

Regarding personality, participants who reported being more conscientious persisted more with the program (a large effect). This supports prior findings of a relationship between conscientiousness and adherence to other types of treatment (Axelsson, 2013; Stilley et al., 2004; Hill & Roberts, 2011).

A stepped-care approach may be useful, in which online self-directed interventions are offered to suitable clients, and intensive interventions, such as therapist-moderated versions, are recommended for others (Gellatly et al., 2007; Spek et al., 2007). Online programs may be most suitable for those with milder symptoms (Mains & Scogin, 2003), with online REACH Forgiveness suitability involving pre-existing perspective-taking tendencies, willingness to forgive

an offender, and conscientiousness. A brief pre-assessment screening questionnaire with recommended cut-off points needs development and evaluation. The current version of REACH aimed to serve as a prevention or enrichment intervention, such that application to clinical populations may require adjustments and moderation by a clinician.

The low uptake and adherence rates for this online intervention suggest that new methods for recruiting, engaging and retaining appropriate participants need to be developed and trialed. This community study recruited participants through use of broad advertising on websites and through social networks that may not have attracted the most engaged participants. In future research, in addition to the common approach of recruiting students for course credit, community-targeted methods could include targeting particular communities. For example, forgiveness interventions as a method for addressing relationship damage have been shown to be particularly appropriate, and well received in married couples (Paleari, Girogia, & Fincham, 2015; Ripley & Worthington, 2002). Church groups could be approached to sponsor the program as religious groups tend to have positive values regarding forgiveness (Greer et al., 2014) and religious and spiritual matching improves outcomes (Hook, Ripley, Worthington, & Davis, 2011; Worthington, Hook, Davis, & McDaniel, 2011). Further possibilities include making the online intervention available to helping professionals and relationship counselors to use as an adjunct to their services and recruiting through those services; or seeking internet communities with a particular focus on relationship issues or wellbeing. Further possibilities include making the online intervention available to helping professionals and relationship counselors to use as an adjunct to their services and recruiting through those services; or seeking internet communities with a particular focus on relationship issues or wellbeing.

Importantly, to increase retention, we also recommend future review and enhancement of the stimulus properties of the internet intervention itself. While our pilot participants did not indicate substantive issues with the program, a qualitative study investigating reasons for drop

out may provide pointers for future development. Enhancements could include further improvements to the look and feel of the site. Further, given that most drop out occurred between modules, while participants were offline, equally important may be encouragers to draw participants back to the site. Examples might be “teasers” about topics to come; automated daily email reminders including earning ‘badges’ or ‘points’ for accomplishments or daily participation; exercises that have users preprogram cues in their workaday environment (i.e., encouraging them to make a commitment to when they intend to return, using Kelman’s, 1958, commitment theory); putting a reminder in their daytimer or on their electronic calendar; or giving a friend permission to encourage their completion of the course of treatment. Furthermore, interventions should include explicit suggestions, early in the treatment (i.e., before the end of the first module) to participants about returning to the website if they take a break.

While low willingness to attempt to forgive the offender may have been a person characteristic, as mentioned earlier, it may also have indicated a non-optimal choice of an offense to work through initially. Participants were encouraged to avoid choosing too easy (already forgiven) or extreme (e.g., involving danger to self) offenses to work on; however, further research into how best to advise selecting target offenses to work through in the program appears warranted.

Consideration of program goals, form of delivery and associated costs is essential in deciding whether to include more monitoring and interaction with mental health professionals who monitor responses. If such an online program is employed as an adjunct to ongoing psychotherapy, a mechanism needs to be included for regular feedback and interaction between personnel in the mental health provider’s agency and the patient. This might include daily emails inquiring about progress, acknowledging progress and addressing any barriers to completion. Although this increases staff time, it is likely that this will bring attrition into the range uncovered in meta-analyses (e.g., Kelders et al., 2012).

Several study limitations should be noted, the main one being the small sample size, resulting from post-randomization attrition, and the predominantly female sample. The small number of male participants reduced generalizability of conclusions from the study and precludes testing for gender differences in program outcomes. Miller, Worthington, and McDaniel (2008) in a meta-analysis found that men were four times as likely to pursue revenge but only half as likely to hold long-term grudges as were women. Men and women, though, are equally likely to forgive (Miller et al., 2008 Fehr et al., 2010). A preponderance of women participants is not uncommon in community-based studies of forgiveness including questionnaire studies (e.g., Blatt & Wertheim, 2015, 77% women) and interventions (e.g., Kiefer et al., 2017, 86% women) suggesting that future researchers should explore methods for attracting men to community forgiveness interventions. It is possible that sex differences might have affected the results; for example, the lack of reductions in revenge motivations found may have partly been a floor effect in this predominantly female sample. Despite these potential sex differences in results, we chose to retain the male participants to retain power.

Post-intervention data were not collected for participants who dropped out of the program, and since those numbers were substantial, intention-to-treat analyses were not conducted. Further strategies are needed in future for obtaining post-intervention outcomes, or assessing some outcomes periodically over the course of the program. Furthermore, our study, similar to most forgiveness intervention studies to date (Worthington et al., 2017), did not include a positive indicator of subjective wellbeing. Future research would benefit from this addition. Future research should compare online, interactive REACH Forgiveness with other alternative interventions and active controls and compare intervention group follow-up outcomes to those of non-intervention participants. Finally, a systematic cost-benefit analysis needs to be done comparing minimally monitored and supported interventions such as this REACH approach with more strongly counselor- or operator- supported approaches, including from a health economics perspective. It is already known that there are many benefits accruing

when people try to forgive (and succeed to some extent; see Worthington, Griffin, and Provencher, in press). But analysis is needed for the specific type of intervention we have presented here.

In summary, this is the first study to evaluate an internet-based, interactive self-help REACH Forgiveness program in a community sample, and to explore suitability of this approach and qualities of intervention completers. Findings were promising for the program's ability to improve and maintain emotional forgiveness and overall forgiveness in program completers. Nonetheless, low completion rates and evidence that some individuals are most likely to persist with this approach suggest further research is needed testing ways to further support adherence to this online intervention and to develop a carefully targeted, staged approach for REACH Forgiveness programs as well as other internet-provided interventions.

References

- Akhtar, S., & Barlow, J. (2016). Forgiveness therapy for the promotion of mental well-being: A systematic review and meta-analysis. *Trauma, Violence, and Abuse, 1-17*.
- Alfonsson, S., Olsson, E., & Hursti, T. (2016). Motivation and treatment credibility predicts dropout, treatment adherence, and clinical outcomes in an internet-based cognitive behavioral relaxation program: A randomized controlled trial. *Journal of Medical Internet Research, 18(3)*, doi: <http://dx.doi.org/10.2196/jmir.5352>
- Antony, M.M., Bieling, P.J., Cox, B.J., Enns, M.W., & Swinson, R.P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10(2)*, 176-181.
- Axelsson, M. (2013). Report on personality and adherence to antibiotic therapy: A population-based study. *BMC Psychology, 1(1)*, 24.
- Barak, A., Hen, L., Boniel-Nissim, M., & Shapira, N.a. (2008). A comprehensive review and a meta-analysis of the effectiveness of internet-based psychotherapeutic interventions. *Journal of Technology in Human Services, 26(2-4)*, 109-160.
- Berry, J.W., Worthington, E.L., Jr., O'Connor, L.E., Parrott, L., & Wade, N.G. (2005). Forgiveness, vengeful rumination, and affective traits. *Journal of Personality, 73(1)*, 183-226.
- Blatt, L., & Wertheim, E.H. (2015). Development of the Factors Related to Forgiveness Inventory (FRFI). *European Journal of Psychological Assessment, 31(2)*, 100-108.
- Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality. *Psychological Bulletin, 130*, 887-919.
- Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research and Therapy, 35(1)*, 79-89. doi.org/10.1016/s0005-7967(96)00068-x

- Campbell, D.T., & Stanley, J.C. (1966). *Experimental and quasi-experimental designs for research*. Chicago, IL: Rand McNally.
- Christensen, H., Griffiths, K.M., & Farrer, L. (2009). Adherence in internet interventions for anxiety and depression: systematic review. *Journal of Medical Internet Research*, 11(2), e13.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. (2nd ed.) Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Coke, J.S., Batson, C.D., & McDavis, K. (1978). Empathic mediation of helping: A two-stage model. *Journal of Personality and Social Psychology*, 36(7), 752-766.
- Davis, M.H. (1980). A multidimensional approach to individual differences in empathy. *Catalog of Selected Documents in Psychology*, 10(4), 1-17.
- Davis, M.H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44(1), 113-126.
- Donnellan, M.B., Oswald, F.L., Baird, B.M., & Lucas, R.E. (2006). The mini-IPIP scales: tiny-yet-effective measures of the Big Five factors of personality. *Psychological Assessment*, 18(2), 192-203.
- Enright, R.D., & Fitzgibbons, R.P. (2014). *Forgiveness therapy: An empirical guide for resolving anger and restoring hope*. Washington DC: American Psychological Association.
- Farrer, L. M., Griffiths, K. M., Christensen, H., Mackinnon, A. J., & Batterham, P. J. (2014). Predictors of adherence and outcome in internet-based cognitive behavior therapy delivered in a telephone counseling setting. *Cognitive Therapy and Research*, 38(3), 358-367.
- Fehr, R., Gelfand, M.J., & Nag, M. (2010). The road to forgiveness: a meta-analytic synthesis of its situational and dispositional correlates. *Psychological Bulletin*, 136(5), 894-914.

- Foa, E. B., McNally, R. J., & Williams, L. (1996). Mechanisms of change in exposure therapy. In R.M. Rapee (Ed.), *Current controversies in the anxiety disorders* (pp. 329–343). New York, NY: Guilford Press.
- Gellatly, J., Bower, P., Hennessy, S., Richards, D., Gilbody, S., & Lovell, K. (2007). What makes self-help interventions effective in the management of depressive symptoms? Meta-analysis and meta-regression. *Psychological Medicine*, 37(09), 1217-1228.
- Graham, V. N., Enright, R. D., & Klatt, J. S. (2012). An educational forgiveness intervention for young adult children of divorce. *Journal of Divorce and Remarriage*, 53(8), 618-638
- Greer, C.L., Worthington, E.L., Jr., Lin, Y., Lavelock, C.R., & Griffin, B.J. (2014). Efficacy of a self-directed forgiveness workbook for Christian victims of within-congregation offenders. *Spirituality in Clinical Practice*, 1(3), 218-230.
- Griffiths, K.M., Farrer, L., & Christensen, H. (2010). The efficacy of internet interventions for depression and anxiety disorders: a review of randomised controlled trials. *Medical Journal of Australia*, 192(11), S4-11.
- Harper, Q., Worthington, E.L., Jr., Griffin, B.J., Lavelock, C.R., Hook, J.N., Vrana, S.R., et al. (2014). Efficacy of a workbook to promote forgiveness: A randomized controlled trial with university students. *Journal of Clinical Psychology*, 70(12), 1158-1169.
- Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Orlando, FL: Academic Press.
- Hill, P. L., & Roberts, B. W. (2011). The role of adherence in the relationship between conscientiousness and perceived health. *Health Psychology*, 30(6), 797-804.
- Hook, J. N., Ripley, J. S., Worthington, E. L., Jr., & Davis, D. E. (2011). Christian approaches for helping couples: Review of empirical research and recommendations for clinicians. *Journal of Psychology and Christianity*, 30 (3), 213-222.

- Karyotaki, E., Kleiboer, A., Smit, F., Turner, D. T., Pastor, A. M., Andersson, G., Berger, T., Botella, C., Breton, J. M., Carlbring, P., Christensen, H., de Graaf, E., Griffiths, K., Donker, T., Farrer, L., Huibers, M. J. H., Lenndin, J., Mackinnon, A., Meyer, B., Moritz, S., Riper, H., Spek, V., Vernmark, K., & Cuijpers, P. (2015). Predictors of treatment dropout in self-guided web-based interventions for depression: An 'individual patient data' meta-analysis. *Psychological Medicine*, 45(13), 2717-2726.
- Kazdin, A.E., & Rabbitt, S.M. (2013). Novel models for delivering mental health services and reducing the burdens of mental illness. *Clinical Psychological Science*, 170-191.
- Kelman, H. (1958). Compliance, identification, and internalization: Three processes of attitude change. *Journal of Conflict Resolution*, 2(1), 51-60.
- Kelders, S.M., Kok, R.N., Ossebaard, H.C., & Van Gemert-Pijnen, J.E. (2012). Persuasive system design does matter: a systematic review of adherence to web-based interventions. *Journal of Medical Internet Research*, 14(6), e152.
- Kiefer, R. P., Worthington, E. L., Jr., Myers, B. J., Kliewer, W. L., Berry, J. W., Davis, D. E., Kilgour, J. M., Miller, A. J., Van Tongeren, D. R., & Hunter, J. L. (2017). Training parents in forgiving and reconciling. *American Journal of Family Therapy*, 38(1), 32-49.
- Lampton, C., Oliver, G., Worthington, E. L., Jr., & Berry, J. W. (2006). Helping Christian college students become more forgiving: An intervention study to promote forgiveness as part of a program to shape Christian character. *Journal of Psychology and Theology*, 33, 278-290.
- Lin, Y., Worthington, E.L., Jr., Griffin, B.J., Greer, C.L., Opare-Henaku, A., Lavelock, C.R., et al. (2014). Efficacy of REACH forgiveness across cultures. *Journal of Clinical Psychology*, 70(9), 781-793.
- Lovell, K., Richards, D.A., & Bower, P. (2003). Improving access to primary mental health care: uncontrolled evaluation of a pilot self-help clinic. *British Journal of General Practice*, 53(487), 133-135.

- Lovibond, S., & Lovibond, P. (1995a). *Manuals for the Depression Anxiety Stress Scales*, (2nd ed.). Sydney, NSW: Psychology Foundation.
- Lovibond, S., & Lovibond, P. (1995b). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33(3), 335-343.
- Mains, J.A., & Scogin, F.R. (2003). The effectiveness of self-administered treatments: a practice-friendly review of the research. *Journal of Clinical Psychology*, 59(2), 237-246.
- McCrae, R. R., & Costa, P. T. (2003). *Personality in adulthood: A five-factor theory perspective*. New York, NY: Guilford Press.
- McCullough, M.E., & Hoyt, W.T. (2002). Transgression-related motivational dispositions: Personality substrates of forgiveness and their links to the Big Five. *Personality and Social Psychology Bulletin*, 28(11), 1556-1573.
- McCullough, M.E., Rachal, K.C., Sandage, S.J., Worthington, E.L., Jr., Brown, S.W., & Hight, T.L. (1998). Interpersonal forgiving in close relationships: II. Theoretical elaboration and measurement. *Journal of Personality and Social Psychology*, 75(6), 1586-1603.
- Miller, A. J., Worthington, E. L., Jr., & McDaniel, M. A. (2008). Gender and forgiveness: A meta-analytic review and research agenda. *Journal of Social and Clinical Psychology*, 27(8), 843-876.
- Palaeri, F. G., & Fincham, F. D. (2015). The reciprocal relationship between husbands and wives' marital forgiveness: A two-wave cross-lagged latent difference score analysis of ten-year data. *Testing, Psychometrics, Methodology in Applied Psychology*, 22 (2) 287-308.
- Ripley, J. S., & Worthington, E. L., Jr. (2002). Hope-focused and forgiveness-based group interventions to promote marital enrichment. *Journal of Counseling and Development: JCD*, 80(4), 452-463.

- Rye, M.S., Loiacono, D.M., Folck, C.D., Olszewski, B.T., Heim, T.A., & Madia, B.P. (2001). Evaluation of the psychometric properties of two forgiveness scales. *Current Psychology, 20*(3), 260-277.
- Spek, V., Cuijpers, P., Nyklíček, I., Riper, H., Keyzer, J., & Pop, V. (2007). Internet-based cognitive behaviour therapy for symptoms of depression and anxiety: a meta-analysis. *Psychological Medicine, 37*(3), 319-328.
- Stilley, C. S., Sereika, S., Muldoon, M. F., Ryan, C. M., & Dunbar-Jacob, J. (2004). Psychological and cognitive function: Predictors of adherence with cholesterol lowering treatment. *Annals of Behavioral Medicine, 27*(2), 117-124.
- Strelan, P., & Covic, T. (2006). A review of forgiveness process models and a coping framework to guide future research. *Journal of Social and Clinical Psychology, 25*, 1059-1085.
- Tabachnick, B.G., & Fidell, L.S. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson Education.
- Toussaint, L. L., Shields, G. S., & Slavich, G. M. (2016). Forgiveness, stress, and health: A 5-week dynamic parallel process study. *Annals of Behavioral Medicine, 50*(5), 727-735.
- Wade, N. G., Hoyt, W.T., Kidwell, J.E., & Worthington, E.L., Jr. (2014). Efficacy of psychotherapeutic interventions to promote forgiveness: A meta-analysis. *Journal of Consulting and Clinical Psychology, 82*(1), 154-170.
- Wade, N. G., & Worthington, E.L., Jr. (2005). In search of a common core: A content analysis of interventions to promote forgiveness. *Psychotherapy: Theory, Research, Practice, Training, 42*(2), 160-177.
- Worthington, E. L., Jr. (2001). *Five steps to forgiveness: The art and science of forgiving*. New York: Crown House.
- Worthington, E. L., Jr. (2006). *Forgiveness and reconciliation: Theory and application*. New York: Routledge.

- Worthington, E. L., Jr., Berry, J. W., Hook, J. N., Davis, D. E., Scherer, M., Griffin, B. J., Wade, N. G., Yarhouse, M., Ripley, J. S., Miller, A. J., Sharp, C. B., Canter, D. E., & Campana, K. L. (2015). Forgiveness-reconciliation and communication-conflict-resolution interventions versus rested controls in early married couples. *Journal of Counseling Psychology, 62*(1), 14-27.
- Worthington, E. L., Jr., Griffin, B. J., & Provencher, C. (2017). Forgiveness. In James E. Maddux (Ed.), *Social psychological foundations of well-being and life satisfaction* (pp.). New York, NY: Oxford University Press, under editorial review.
- Worthington, E. L., Jr., Hook, J. N., Davis, D. E., McDaniel, M. A. (2011). Religion and spirituality. In John C. Norcross (Ed.), *Relationships that work, 2nd ed.* (pp. 402-419). New York: Oxford University Press.
- Worthington, E. L., Jr., Hook, J., Utsey, S., Williams, J., & Neil, R. (2007). Decisional and emotional forgiveness, International Positive Psychology Summit, Washington, DC.
- Worthington Jr, E., Lavelock, C., & Scherer, M. (2012). *The path to forgiveness: Six practical sessions for becoming a more forgiving person, self-directed learning workbook.* Richmond, VA.
- Worthington, E. L., Jr., Witvliet, C. V. O., Pietrini, P., & Miller, A. J. (2007). Forgiveness, health, and well-being: A review of evidence for emotional versus decisional forgiveness, dispositional forgivingness, and reduced unforgiveness. *Journal of Behavioral Medicine, 30*, 291-302.
- Ybarra, M.L., & Eaton, W.W. (2005). Internet-based mental health interventions. *Mental Health Services Research, 7*(2), 75-87.

Table 1

Estimated Marginal Means (Standard Errors) and Interaction Effects from Mixed ANCOVAs Comparing Immediate versus Delayed Treatment Groups at Times 1 and 2 for Outcome Measures

	Full sample				Group x Time <i>F</i> (1, 57)	<i>p</i>	<i>d</i>	Females only	
	Immediate treatment (<i>N</i> = 23)		Delayed treatment (<i>N</i> = 40)					Group x Time <i>F</i> (1, 54)	<i>p</i>
	Time 1 <i>M</i> (<i>SE</i>)	Time 2 <i>M</i> (<i>SE</i>)	Time 1 <i>M</i> (<i>SE</i>)	Time 2 <i>M</i> (<i>SE</i>)					
State forgiveness (Rye)	45.29 (1.80)	58.13 (1.75)	48.48 (1.31)	48.65 (1.27)	43.36	<.001	1.52	40.56	<.001
Emotional forgiveness	19.61 (1.20)	27.47 (1.33)	22.87 (0.87)	23.03 (0.97)	23.57	<.001	1.37	21.52	<.001
Decisional forgiveness	30.90 (1.24)	33.03 (1.05)	31.46 (0.90)	32.73 (0.76)	0.51	.478	0.15	0.73	.397
Avoidance	3.63 (0.23)	2.80 (0.22)	3.22 (0.16)	3.35 (0.16)	19.18	<.001	0.92	19.44	<.001
Revenge _{SQRT}	1.23 (0.07)	1.13 (0.06)	1.23 (0.05)	1.15 (0.04)	0.18	.671	0.06	0.07	.787

State empathy	2.65 (0.29)	3.39 (0.28)	2.54 (0.21)	2.57 (0.20)	6.76	.012	0.52	4.99	.030
Stress	14.60 (1.91)	10.96 (1.88)	11.15 (1.42)	11.70 (1.39)	5.22	.026	0.43	1.62	.209
Depression _{sqrt}	2.36 (0.36)	2.22 (0.34)	2.46 (0.27)	2.41 (0.25)	0.37	.546	0.20	0.11	.740

Note: Transgression-specific variable analyses $df = 1, 57$, including covariates willingness to forgive, trait forgiveness, perspective taking, and severity_{sqrt}. Stress and depression analyses, $df = 1, 59$, including covariates trait forgiveness, perspective taking. d = Cohen's d . **Bold** p levels are significant after Bonferroni adjustment. $d = d_{ppc2}$ sensu, Morris (2008), which compares difference between change over time for the two groups.

Table 2

Means (Standard Deviations) and Interaction Effects from Repeated-Measures ANOVAs Comparing Times 1, 2, and 3 for Completer Participants

	<i>Full sample</i>							<i>Females only</i>		
	Time 1 <i>M (SD)</i>	Time 2 <i>M (SD)</i>	Time 3 <i>M (SD)</i>	<i>N</i>	<i>F</i>	<i>p</i>	<i>d</i>	<i>N</i>	<i>F</i>	<i>p</i>
State forgiveness	49.74 _a (10.82)	60.48 _B (10.55)	60.03 _B (10.67)	31	28.96	<.0005	2.79	29	30.31	<.0005
Emotional forgiveness	21.12 _a (6.62)	28.28 _B (7.78)	28.00 _B (7.35)	32	30.46	<.0005	2.45	30	28.57	<.0005
<i>Decisional forgiveness</i>	32.25 _a (5.67)	34.97 _B (4.07)	34.03 (4.77)	32	6.04	.004	1.44	30	6.47	.003
Avoidance	3.20 _a (1.06)	2.50 _B (1.16)	2.64 _b (1.18)	31	8.63	.001	1.60	29	8.43	.001
<i>Revenge</i> _{log10}	0.09 _a (0.13)	0.05 _b (0.12)	0.10 (0.15)	31	2.64	.079	0.94	29	2.08	.144
<i>State empathy</i>	2.75 (1.68)	3.41 (1.65)	3.09 (1.81)	31	5.26	.012	1.40	29	3.94	.032

<i>Depression_{SQRT}</i>	<i>2.11</i> <i>(1.58)</i>	<i>1.82</i> <i>(1.55)</i>	<i>1.62</i> <i>(1.47)</i>	<i>31</i>	<i>1.42</i>	<i>.249</i>	<i>0.05</i>	<i>29</i>	<i>1.29</i>	<i>.284</i>
<i>Stress</i>	<i>13.32_a</i> <i>(4.63)</i>	<i>11.64_b</i> <i>(3.74)</i>	<i>11.00_b</i> <i>(3.84)</i>	<i>31</i>	<i>5.55</i>	<i>.011</i>	<i>1.06</i>	<i>29</i>	<i>4.86</i>	<i>.019</i>

Note. Alpha values for *F* statistic use family-wise Bonferroni adjustments for multiple comparisons of .008. Italicized measures did not show significant pre-post differences between intervention and control groups in prior analyses.

a, b = Means differ at $p < .05$; a, B = Means differ at $p < .006$

^c Overall *F* only approached Bonferonni adjusted alpha level; however, post hoc pre-post test still significant $p < .006$.

Table 3

Hierarchical Regression Analysis Predicting Persistence with REACH Modules from Pre-treatment Variables in the Full Sample (and in Females Only)

	β		t		p		r		r_{sp}	
	Full	(Female)	Full	(Female)	Full	(Female)	Full	(Female)	Full	(Female)
Step 1										
Full sample: $F(2, 59) = 2.07, p = .135, R^2 = .066, \text{Adj } R^2 = .034$										
Female only: $F(2, 54) = 1.72, p = .189, R^2 = .060, \text{Adj } R^2 = .025$										
Age	.218	(.210)	1.73	(1.59)	.089	(.118)	.206	(.196)	.217	(.240)
Education level	.152	(.147)	1.21	(1.11)	.232	(.273)	.136	(.126)	.152	(.107)
Step 2										
Full sample: $F(5, 54) = 6.21, p < .0005, R^2\Delta = .341, \text{Adj } R^2 = .330$										
Female only: $F(5, 49) = 5.84, p < .0005, R^2\Delta = .351, \text{Adj } R^2 = .327$										
Trait forgivingness	-.188	(-.231)	-1.38	(-1.62)	.175	(.112)	.202	(.156)	-.145	(-.177)
Conscientiousness	.289	(.271)	2.66	(2.32)	.010	(.024)	.304	(.303)	.279	(.255)
Perspective taking	.342	(.383)	2.78	(2.94)	.006	(.005)	.404	(.450)	.341	(.323)
Depression _{SQRT}	.036	(.033)	0.31	(0.27)	.752	(.789)	-.131	(-.141)	.033	(.029)
Willingness to forgive _{Reflected Log10}	-.376 ^a	(-.336)	-3.40 ^a	(-2.95)	.001	(.005)	-.404 ^a	(-.374)	-.356 ^a	(-.323)

^a After transformation, lower Willingness to forgive_{Reflected Log10} scores indicate more willingness to forgive the offender. Note: **Bold** are significant, $p < .05$.

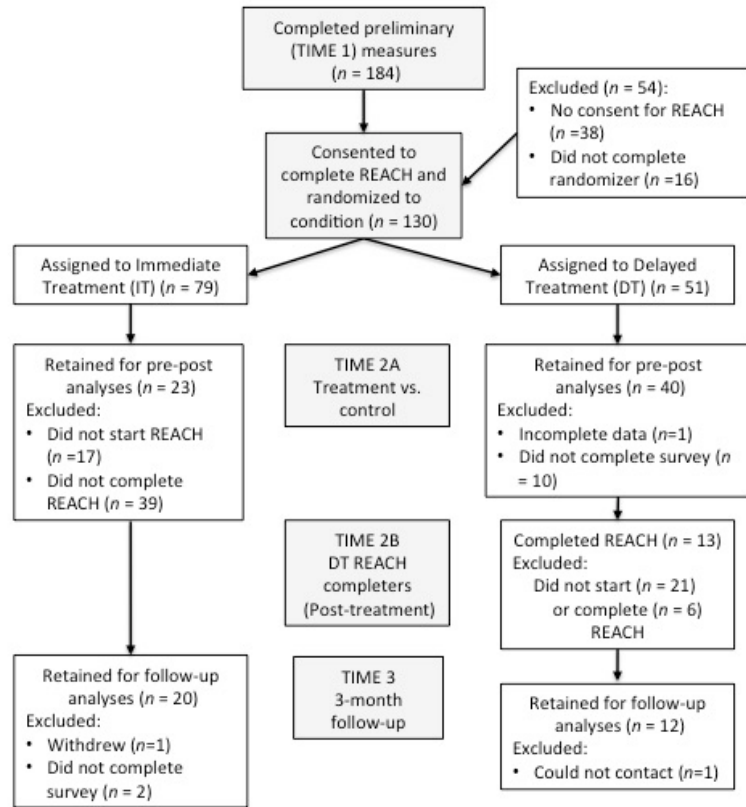


Figure 1. CONSORT Flow Chart