EVALUATION OF AN ONLINE, SELF-HELP ADAPTATION OF THE *REACH FOR FORGIVENESS* PROGRAM: ASSESSING FORGIVENESS AND WELLBEING OUTCOMES, PREDICTORS OF PROGRAM ADHERENCE AND MODERATORS OF EFFECTIVENESS

Submitted by

Jennifer Nation

BA (Hons), Master Counselling & Human Services, BPsySc (Hons)

A thesis submitted in partial fulfillment of the requirements

for the degree of Doctor of Clinical Psychology

College of Science, Health and Engineering

School of Psychology and Public Health

Department of Psychology & Counselling

La Trobe University

Victoria, Australia

August 2016

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Acknowledgements

In submitting this thesis, I would like to acknowledge the contribution of my supervisor, Professor Eleanor H. Wertheim. Thank you Eleanor, for your inspiration, enthusiasm, and guidance over the past four years. I am immensely grateful for your humour, kindness, insight, experience, and wisdom, and appreciate the many generous gifts of time, encouragement, and thoughtful feedback you have given me.

My gratitude also extends to staff in the Department of Psychology and Counselling who have contributed in direct and indirect ways to the development of the skills I needed to undertake this research project and interpret its findings. Thanks also to members of the Latrobe University Human Ethics Committee and my Research Progress Panel, who contributed their experience and wisdom to this research.

Very special thanks to Dr Everett Worthington, Jr., for his generosity in granting permission for me to adapt the REACH program for online administration, and for his immensely inspiring work thinking, writing, and research into forgiveness.

I also wish to acknowledge the sustenance, kindness, and companionship of my colleagues in the Clinical Psychology Doctorate and Masters programs from 2013 to 2016. In particular, I thank my fellow long-haul doctoral travellers Alex, Bec, and Tania.

Finally, my heartfelt appreciation to the participants in this study for their willingness to contribute their time and share private and painful experiences for the benefit of this research.

This thesis is dedicated to my parents, who have this year faced the devastation of sudden illness and disability with courage, dignity, patience, and determination. And also to my partner, who has supported me with goodwill, faith, humour, and love throughout my long educational journey, and who daily models my favourite virtues: Empathy, compassion, humility, and forgiveness.

Abstract

Three empirical studies examined the outcomes of an online, self-directed adaptation of the *REACH for Forgiveness* program on forgiveness and psychological wellbeing. REACH is a six-module program promoting forgiveness of an interpersonal transgression which has received empirical support in research investigating group-based and self-directed workbook versions. Study 1 examined outcomes in individuals who had completed REACH at post intervention, compared to a waitlist control, and at three-month follow-up. Community-based adults (94.6% Australian residents) responded to social media and noticeboard advertisements, were randomised to immediate treatment (IT) and delayed treatment (DT) conditions, and completed assessments at three time points: pre-intervention, post-intervention (immediate treatment *n*= 23; delayed treatment *n* = 40) and three month follow-up (*n* = 32; course completers only). Study 2 investigated how well individual differences, situation specific social-cognitive factors, and early program behaviours predicted persistence in completing REACH modules by participants initially randomised to the IT condition, *n* = 79. Study 3 explored pre-program and within-program factors which moderated forgiveness outcomes in REACH completers (*n* = 36) and potential mechanisms underlying REACH effectiveness. The research findings provide evidence of the positive effects of online REACH on overall forgiveness, emotional forgiveness, avoidance of the offender, rumination, state empathy, and stress; but not revenge motivations, decisional forgiveness, or depression. With the exception of state empathy, post-course improvements were maintained by course completers at three-month follow-up. REACH completers also showed a significant increase in trait forgiveness between pre-course and follow-up. Logistic regression modelling suggested that the most parsimonious model for predicting individual persistence with the REACH program after commencement included baseline perspective taking, conscientiousness, and willingness to forgive the offender. Time spent online during Module 1 also predicted subsequent persistence with REACH. Factors which moderated forgiveness outcomes of REACH included trait empathic concern, attribution of non-malicious intent, religiosity, and hurt feelings reported during Module 2; with a range of other individual differences, situation-specific and social-cognitive factors, and within-program behaviours not predicting significantly. Changes in state affective empathy, humility, empathic responses, attributions of non-malicious intent, and condoning-related beliefs about forgiveness were indicated as possible mechanisms underlying the effectiveness of REACH at post-intervention. The research demonstrates the potential of a self-directed, online version of the REACH program and highlights the importance of further refinements and investigation into its effects.

Statement of Authorship

Except where reference is made in the text of the thesis, this thesis contains no material published elsewhere or extracted in whole or in part from a thesis accepted for the award of any other degree or diploma. No other person's work has been used without due acknowledgment in the main text of the thesis. This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution.

Jennifer Nation

30 November 2016

Introduction: Review of Literature on Forgiveness and Forgiveness Interventions

The tendency to forgive people who have hurt or offended us is associated with a range of psychological and physiological wellbeing factors (Witvliet, 2005). An extensive body of research has explored the benefits and correlates of forgiving others, and theories have been developed to explain and predict forgiveness processes. As prolonged unforgiveness can exact a high cost on individual wellbeing and relationships (Toussaint & Webb, 2005; Witvliet, 2005), much attention has been paid to the development of intervention programs to promote forgiveness.

This literature review considers forgiveness research to date, serving as an introduction for three studies evaluating the outcomes of an online, self-administered adaptation of an existing forgiveness intervention, REACH for Forgiveness. REACH is a psychoeducational intervention to promote forgiveness of interpersonal transgressions based upon a process model of forgiveness (Worthington, 2001). Forgiveness literature will be surveyed, beginning with an overview and then focusing on forgiveness intervention research. First, definitions and theories arising from the psychological study of forgiveness will be explored with an emphasis on those models most relevant to research and development of interventions promoting interpersonal forgiving. Then the evidence underlying the theorised benefits of forgiveness will be evaluated, and factors influencing forgiveness of specific interpersonal transgressions will be discussed. Following this background exploration, the next section will examine the effectiveness of forgiveness interventions with particular attention paid to process theories of forgiveness and evidence supporting the REACH program. Finally, implications of the literature review for the current research will be discussed.

Overview of Forgiveness Literature

Forgiveness has been a topic of philosophical and religious study for centuries (Enright, Gassin & Wu, 1992). Interpersonal forgiveness is encouraged for adherents of major world religions in order to obtain emotional and spiritual benefits for both the forgiver and the forgiven (Enright et al., 1992; Rye et al., 2000; Pargament & Rye, 1998), and, within Christianity, to imitate divine forgiveness (Enright et al., 1992). Forgiveness is explicitly addressed in the traditions of Judaism, Christianity, Islam and Hinduism, whilst in Buddhism it is incorporated within the concepts of forbearance and compassion (Rye et al., 2000). However, forgiveness received no systematic attention from social scientists until the late 1980s when, following recognition of the benefits of forgiveness to mental wellbeing, researchers began to develop theoretical models and conduct empirical studies (Enright & North, 1998; Rye et al., 2000). Subsequently, interest in forgiveness has flourished from many perspectives within psychology, including developmental, counselling, clinical, health, and social psychology (Enright, Santos & Al-Mabuk, 1989; McCullough, Pargament & Thoreson, 2001; Toussaint, Worthington & Williams, 2015a).

Definitions of Forgiveness and Unforgiveness

Following earlier disagreement between researchers regarding what forgiveness is and is not, forgiveness following a hurtful transgression or offence is now broadly understood as a process of decreasing negative emotions, cognitions and behaviours which are resentment based and inter-related (Worthington, 2005). Further, some researchers have defined forgiveness as the outcome of a process of decreasing motivations to avoid the person or exact revenge, as well as pro-social changes in thoughts, feelings and behaviours towards an offender

which includes increased positive attitudes such as benevolence or compassion (Fincham, Hall, Beach, & Worthington, 2005; McCullough, Worthington, & Rachal, 1997). The constellation of resentment, hostility, bitterness, anger, and fear towards a person who has harmed, betrayed or transgressed personal boundaries is described as *unforgiveness* (Worthington & Scherer, 2004). Unforgiveness may include unforgiving motivations towards an offender such as avoidance and revenge (Worthington & Scherer, 2004; Worthington & Wade, 1999).

Definitions of forgiveness may also vary according to the context of the offence. Worthington (2005) proposed that researchers who studied the impact of transgressions by strangers defined forgiveness as reduced unforgiveness, whereas those who focused on transgressions in the context of ongoing relationships observed that full forgiveness involved both reducing unforgiveness and the replacement of negative emotions, cognitions and motivations with positive ones. Similarly, a related distinction has been made between *decisional forgiveness*, in which the offended person decides to control behaviours related to unforgiveness, and a multi-dimensional *emotional forgiveness* which involves pro-social changes in cognition, emotion and motivation (Worthington, 2005; Worthington, Witvliet, Pietrini, & Miller, 2007). For example, decisional forgiveness may be characterised by a person who decides to forgo revenge, ceases outward expression of hostility, or agrees to continue in a friendship, yet continues to experience hurt or anger in relation to the offending transgression. In contrast, emotional forgiveness is characterised by replacement of negative, unforgiving emotions with positive other-oriented emotions such as empathy, sympathy, compassion, or love towards the offender (Worthington, Hook, Utsey, Williams, & Neil, 2007). Thus, decisional forgiveness might be understood as a behavioural intention, and emotional forgiveness represents an affective transformation (Exline, Worthington, Hill, & McCullough, 2003).

Forgiveness theorists interested in the relationship between forgiveness and health emphasise that forgiveness relieves the interpersonally stressful experience of unforgiveness (Worthington, 2006). For example, Strelan and Covic (2006), in their exposition of a stress-coping

model of forgiveness, define forgiveness as the process of neutralizing a stressor that has resulted from the perception of an interpersonal hurt. Thus, whilst decisional forgiveness may lead to stress reduction, emotional forgiveness has a stronger connection to overcoming negative affect and stress reactions and, consequently, is theorised to be more directly related to health and wellbeing (Tucker, Bitman, Wade, & Cornish, 2015; Worthington, Witvliet, et al., 2007).

Theorists and researchers have suggested a number of distinctions between forgiveness, related constructs, and alternative responses to interpersonal transgressions; examples of which follow. Although reconciliation with an offender may be acutely desired, can motivate and be a consequence of forgiving, it is not regarded as the same as forgiveness (Fincham, 2000; Riek & Mania, 2012). For example, especially in relation to repeat offences, some people may seek to forgive an offender in order to relieve themselves of the burden of unforgiveness without resuming the previous relationship. Forgiveness does not imply that offenders should be relieved from the consequences of their actions, so forgiving may be regarded as distinct from excusing, condoning or pardoning (Kaminer, Stein, Mbanga, & Zungu-Dirwayi, 2000; Thompson et al., 2005). Similarly, one can forgive without forgoing the right to pursue justice (Fincham, 2000). Finally, forgiveness is intentional and cannot be equated with the gradual dissipation of negative feelings occurring through forgetting the offence, nor is it explained by processes such as denial of the severity of harm (Fincham, 2000).

Forgiveness-related measures most commonly utilised in research reflect current definitions of forgiveness emphasising pro-social changes in affect, cognition, and motivation, and include measures of unforgiveness (e.g., negative emotions, offence related rumination, revenge or avoidance motivations) and forgiveness. Hence, in research studies higher levels of forgiveness may also be represented by lower scores on unforgiveness measures. Forgiveness is usually measured as a state, regarding forgiveness of a specific transgression (Fehr, Gelfand, & Nag, 2010), but can also be understood and measured as a trait, or dispositional tendency to

forgive others (Brown, 2003; Thompson et al., 2005). Trait forgiveness is sometimes referred to as *forgivingness*. Hence a person who repeatedly forgives others over time and in different situations may come to be seen as a forgiving person (Berry, Worthington, Parrot, O'Connor & Wade, 2001).

Theories of Forgiveness

Forgiveness theories or models elaborate upon definitions by providing a more detailed explanation of the nature and process of forgiveness (Kaminer et al., 2000). Models of forgiveness have varied in the extent to which they draw upon a theoretical basis, provide explanations for how forgiveness occurs, or can inform research and clinical practices (Kaminer et al., 2000; McCullough & Worthington, 1994; Sells & Hargrave, 1998; Strelan & Covic, 2006). An early categorisation of forgiveness models (Kaminer et al., 2000) identified typological models, models based on theories of personality or psychopathology, and task-stage or process models. In this section a range of forgiveness models organised by this categorization will be surveyed in brief, incorporating recent developments in applying theory relating to stress and coping (Lazarus & Folkman, 1984) to forgiveness. This discussion will form the background to a more detailed review of the pyramid model of forgiveness (Worthington, 1998a; 1998b) which is the basis for the REACH for Forgiveness intervention used in this study (Worthington, 2001).

Typological models. Typologies differentiate between forms of forgiveness based upon critical features that distinguish each type (McCullough & Worthington, 1994). For example, an early forgiveness typology distinguished between role-expected forgiveness, expedient forgiveness and intrinsic forgiveness (Trainer, 1981, cited in Kaminer et al., 2000), each characterised by distinct emotions and behaviours (although some researchers might question whether all of these represent true forgiveness). Emphasising a progression of forgiveness types, Nelson (1992; cited in Kaminer et al., 2000) described detached, limited, and full forgiveness,

and Worthington (2005) distinguished decisional forgiveness from emotional forgiveness. Other typologies differentiate between features of dispositional forgiveness related to the target of forgiveness, such as forgiveness of other people, the self, or of situations (Thompson et al., 2005). Forgiveness of situations refers to circumstances that are beyond the individual's control such as physical illness, natural disasters, or overarching constructs such as God or fate (Exline, Yali & Lobel, 1999; Thompson et al., 2005). Similarly, Witvliet, Van Tongeren and Root Luna (2015) identified a multi-dimensional schema for assessing forgiveness-related phenomena in healthcare. This schema distinguished between giving and receiving forgiveness for actions or failure to act, and between interpersonal forgiveness, self-forgiveness and sacred forgiveness, where sacred forgiveness was related to receiving God's forgiveness or resolving anger against God. The dimension of granting interpersonal forgiveness was further broken down into forgiveness of close relationships, strangers and medical professionals (Witvliet et al., 2015).

Typological models of forgiveness may be useful to clinicians as they illustrate the variety of motivations to forgive and the consequences of different forgiveness types (Kaminer et al., 2000; McCullough & Worthington, 1994). However, given their descriptive nature they need to be supplemented by other types of explanatory and predictive models.

Models based on psychological theories. Forgiveness models have been based on psychological theories including psychoanalytic, existential, object relations, personal construct, family systems, cognitive and stress-coping theories (Kaminer et al., 2000; McCullough & Worthington, 1994; Sells & Hargrave, 1998; Worthington, 2006). These models draw on concepts from their parent theories to explain the psychological function of forgiveness.

Hargrave (1994) integrated forgiveness into contextual family therapy (Boszormenyi-Nagy, 1987), focusing on relational ethics and the idea that relationships depend on equity between entitlements and obligations. Hargrave conceptualises forgiveness as a non-linear interaction between four stations: insight, understanding, compensation and forgiveness. *Insight*

and *understanding* allow for "exoneration" of the offender through recognising destructive patterns and the limitations of the offender without removing their responsibility (Hargrave, 1994). *Compensation* refers to the victim giving the perpetrator an opportunity to act restoratively and demonstrate trustworthiness, whilst *forgiveness* is seen as an overt act which includes open discussion of injurious behaviour (Hargrave, 1994). Progression through these four stations is viewed as reciprocal rather than staged, allowing for progressive effort to develop alternative relational patterns and forgiveness (Hargrave, 1994; Sells & Hargrave, 1998).

Kernberg's object relations theory (1984, 1992) is the basis for a forgiveness model proposed by Gartner (1988), which involves integrating the good and bad aspects of an offender. Forgiveness is described as a process during which anger and aggression towards the offender are gradually moderated by appreciation of the offender's good qualities and empathy for their flaws. Disruptions to forgiveness are understood as arising from primitive defences such as splitting (e.g.,, when the forgiver perceives himself as "all good" and the offender "all bad") (Gartner, 1988; Vitz & Mango, 1997). Hence the state of authentic forgiveness is associated with an integrated and realistic perception of both the positive and negative aspects of self and others, emphasising a cognitive dimension of forgiveness in addition to the replacement of negative affect with positive loving feelings (Vitz & Mango, 1997).

Forgiveness models based upon parent psychological theories have the advantage of being theoretically robust and internally consistent, and provide explanations of forgiveness processes and guidance for therapeutic practice, at least to those clinicians familiar with the relevant theoretical orientation (Kaminer et al., 2000; McCullough & Worthington, 1994). However, evaluation of interventions based on these models has been overshadowed by a much larger amount of empirical research on process models (to be described later) and stress and coping models.

Stress and coping models of forgiveness. Stress-coping models of forgiveness (Strelan & Covic, 2006; Worthington, 2006) are based on Lazarus and Folkman's (1984) *stress and coping model*, in which the perception of an event as a stressor is influenced by appraisals which create physiological, cognitive, motivational, behavioural and emotional stress reactions. Coping, framed as attempts to resolve or alleviate stress reactions, might include problem-focused or emotion-focused coping strategies or both (Lazarus & Folkman, 1984). The conceptualisation of forgiveness as a type of coping process has been driven by recognition that unforgiveness can be construed as a stress reaction to a transgression (Berry & Worthington, 2001; Strelan & Covic, 2006; Witvliet, Ludwig & Vander Laan, 2001; Worthington & Scherer, 2004).

In the *stress and coping theory of forgiveness*, Worthington (2006) also drew upon the *emotional replacement hypothesis* (Worthington & Wade, 1999), which defines forgiveness as a process during which the negative emotions of unforgiveness are supplanted by the positive emotions of forgiveness. The stress and coping theory is a biopsychosocial model of forgiveness which articulates a nonlinear process gradually progressing from transgression, interpretation of the event as hurtful or unfair, unforgiveness, and coping, to forgiveness (Worthington, 2006). The model, which will not be exhaustively described here, gives a comprehensive account of forgiveness processes which acknowledges the non-linear nature of natural forgiving processes, including the impact of relational and situation-specific factors, and provides a convenient conceptual framework for guiding research into the relationship between forgiveness and health (Toussaint et al., 2015b; Witvliet et al., 2015). In addition, the construal of unforgiveness as a stressor and forgiveness as an emotion-focused coping strategy (Worthington & Scherer, 2004) has particular relevance to the development and evaluation of forgiveness interventions, and suggests including measures of stress in intervention studies.

Cognitive-developmental models*.* In addition to models based on general psychological theories, forgiveness models have also been based upon the developmental framework of Kohlberg's theory of moral development (1969, 1973, 1976), which emphasises the staged

development of moral reasoning and ethical behaviour based upon the development of cognitive skills. The models of Enright and the Human Development Study Group (1991) and Nelson (1992; cited in McCullough & Worthington, 1994) focus on the cognitive development of the forgiver, from an egocentric perspective to the ability to empathically adopt the perspectives of others. In the most highly cited of these models, Enright and colleagues (1991; Enright & Fitzgibbons, 2000) proposed a hierarchy of six styles of forgiveness reasoning: 1) revengeful forgiveness contingent upon the offender being punished to a similar degree; 2) compensational forgiveness where forgiveness can occur out of guilt or if the offender offers compensation or restitution; 3) expectational forgiveness as a response to perceived expectations of others, 4) lawful expectational forgiveness in response to societal, moral or religious pressure, 5) forgiveness to restore social harmony; and 6) forgiveness as love, or unconditional forgiveness. This cognitive-developmental forgiveness theory has a firm theoretical grounding and has stimulated empirical study supporting the suggestion that reasoning concerning forgiveness is developmental and increases with age (Enright et al., 1989).

The conceptualisation of mature forgiveness as a moral and unconditional act has informed the development of Enright's process model of forgiveness therapy (Enright & Fitzgibbons, 2000) which has received extensive empirical support (Al-Mabuk, Enright, & Cardis, 1995; Hebl & Enright, 1993; W. F. Lin, Mack, Enright, Krahn, & Baskin, 2004). This model will be reviewed in a later section of forgiveness interventions.

Process models of forgiveness. Process models describe the stages of the forgiveness process over time, including the cognitive, affective and behavioural tasks undertaken by the forgiver at each stage, as well as those which may occur relationally between forgiver and offender (Kaminer et al., 2000; McCullough & Worthington, 1994; Strelan & Covic, 2006). Some process models of forgiveness are based on parent psychological theories such as family systems (Hargrave, 1994) and moral development (Enright & Fitzgibbons, 2000), both described above. Other models are based upon trauma recovery (Gordon & Baucom, 1998), or Batson's (1990)

empathy-altruism hypothesis (Worthington, 1998a, 2001), derived from philosophical or theological writings, or the clinical experiences of their authors (Strelan & Covic, 2006).

Despite wide variation in labelling and describing stages, there exists general agreement that the forgiveness process includes stages of initial feelings of anger and hurt, negative affective and cognitive consequences, acknowledgement that previous strategies for dealing with hurt are ineffective, a decision to forgive or consider forgiveness, and empathy for the offender (Strelan & Covic, 2006). However, fundamental differences between models include emphasis on God's forgiveness in the model, order of elements, transitions between elements, inclusion of interpersonal factors, and conceptualisation of the endpoint of the model (Kaminer et al., 2000; Strelan & Covic, 2006). Conceptualisation of final stage forgiveness reflects the wide variation in forgiveness definitions, and includes, for example, unconditional loving responses (Enright et al., 1991), reconciliation (Hargrave, 1994), realistic appraisal of the offender's good and bad qualities (Gartner, 1988; Vitz & Mango, 1997), and the absence of negative emotions and motivations (Gordon, Baucom & Snyder, 2004).

Process models of forgiveness, especially those grounded in psychological theory, have explanatory power and are therefore helpful for guiding clinicians in facilitating forgiveness and also for explaining the process to people experiencing unforgiveness and wanting to forgive (Kaminer et al., 2000; McCullough & Worthington, 1994). They are useful for promoting forgiveness as a process rather than single event and, along with theoretically based models, can normalise variations in thoughts, feelings and behaviour during forgiveness (McCullough & Worthington, 1994).

Early reviews noted that the operationalization of steps in the forgiveness process should facilitate research to validate models (McCullough & Worthington, 1994; Kaminer et al., 2000; Strelan & Covic, 2006); however, few models have since obtained this empirical support. Process models of forgiveness which are underpinned by broader psychological theory and

supported by empirical research include the Enright model which has been introduced above (Enright & Fitzgibbons, 2000) and the Worthington (1998a) model which will be described in more detail below.

***Worthington's Pyramid Model of Forgiveness*.** An example of a theory developing over time and in response to empirical findings, the *Pyramid Model of Forgiveness* ("the pyramid model") is a theoretically grounded, empirically supported process model of forgiveness. The model forms the basis for the broadly effective forgiveness intervention, REACH (Worthington, 1998b; 2001), which is the focus of the current research.

The origins of the pyramid model can be linked to a seminal analysis of forgiving in close relationships (McCullough et al., 1997), which was based on Batson's hypothesis that empathy motivates people to help others by activating the human capacity for altruism (Batson, 1990, 1991). According to this model, in close relationships the motivation to retaliate or avoid the perpetrator of a transgression is in proportion to the severity of the offense, and associated behaviours such as avoidance of intimacy or revenge can lead to further deterioration in the relationship (Gottman, 1994; McCullough et al., 1997). McCullough and colleagues (1997) proposed that interpersonal forgiving was represented by decreasing motivation to engage in relationship destructive behaviours, and increasing or restored goodwill and conciliatory motivation for the offender in spite of their hurtful actions. In this empathy-based model, forgiveness is seen as an act of altruism, thus the model can be seen as a variant of the empathy-altruism hypothesis.

Although empathy is broadly defined as the experience of feeling as another person feels (Wade & Worthington, 2005), it is more usefully understood in terms of both affective and cognitive components. Davis (1983) proposed a multidimensional model of dispositional empathy which includes (among other less relevant dimensions) *empathic concern*, feelings of sympathy or compassion for the suffering of others, and *perspective taking*, the tendency to

understand or adopt another person's point of view (Davis, 1983). Empathy has been conceptualised as a crucial facilitative condition for overcoming the primary tendency toward destructive responding following an offense (McCullough & Worthington, 1995; McCullough et al.; 1997), in the same way that empathy appears to promote other prosocial phenomena, such as cooperation, altruism and inhibition of aggression (Batson, 1990, 1991; Rusbult, Verette, Whitney, Slovik, & Lipkus, 1991). Whilst the empathy-altruism hypothesis was developed to explain the motivation of people to help strangers (Batson, 1990, 1991), McCullough and colleagues (1997) argued that it could be applied to close relationships. It was further proposed that, after exceeding a certain level, the perceptual salience of the empathy overshadows the perceptual salience of the hurtful actions, leading to forgiving (McCullough et al., 1997).

In addition, it has been suggested that a range of personality, relationship and situation-specific factors may influence the development of forgiveness (Rusbult, et al., 1991). McCullough and colleagues' empathy-forgiving hypothesis (1997) proposed that these factors did so by influencing the timing and extent of the development of empathy. The empathy-forgiveness link has been strongly supported in correlational studies (Fehr et al., 2010; Riek & Mania, 2012), structural equation modelling (McCullough et al., 1997; McCullough et al., 1998), prospective studies (McCullough, Fincham, & Tsang, 2003), experimental studies (Goldman & Wade, 2012; Sandage & Worthington, 2010), and, as will be described later, as a mediator of change in forgiveness (Sandage & Worthington, 2010; Wade & Worthington, 2005; Wade, Worthington, & Meyer, 2005).

Worthington drew on a range of psychological theories in articulating the pyramid model (1998b), earlier described as the *empathy-humility-commitment model* (Worthington, 1998a), as a more comprehensive and structured model explicitly focused on intervening to promote forgiveness rather than explaining naturally occurring instances of forgiveness. He argued that forgiveness was initiated by empathy for the offender, furthered by *humility* in the person who was hurt, and solidified through making a public *commitment* to forgive

(Worthington, 1998b). Humility incorporates an individual's willingness to admit one's real inadequacies to oneself (Means, Wilson, Sturm, Biron & Bach, 1990), along with an ability to acknowledge one's mistakes and imperfections, openness to new ideas, and keeping one's accomplishments in perspective (Tangney, 2000). Worthington (1998b) regarded an ability to acknowledge one's own capacity to hurt, along with the desire to be forgiven, as an important precipitate of the altruistic gesture of forgiving someone who has hurt us. The final component in this model, commitment, arose from the observation that some form of overt behaviour associated with forgiveness serves to ameliorate later doubt and fear of returning hurt feelings (Worthington, 1998a, 1998b). The forgiveness-promoting intervention associated with the pyramid model (REACH; Worthington, 1998a, 2001) has received considerable empirical support (Wade et al., 2014; see later section on forgiveness interventions for a review).

Benefits of Forgiving and Forgivingness

As described in the preceding sections, projected benefits of forgiveness have motivated theorists to engage in model building, testing, and intervention. In this section, theorised benefits of forgiveness and forgivingness to relationship, psychological, and physical health will be outlined, and the available supporting evidence will be reviewed.

Relationship benefits. Within friendships, romantic partnerships, and familial relationships, an ongoing tendency to forgive transgressions has been theorised to contribute to relationship health (Davis, Green, Reid, Moloney, & Burnette, 2015; Fincham, 2000; Fitness & Peterson, 2008). Evidence supporting this proposition will be reviewed briefly here, although specific outcomes of forgiveness for couples and families is beyond the scope of the current research, which is focused on outcomes for individuals.

Dispositional forgiveness has been positively associated intimate relationship quality (Berry & Worthington, 2001) and satisfaction (Braithwaite, Selby, & Fincham, 2011; Thompson et al., 2005). Forgivingness is associated with pro-social traits such as agreeableness, emotional intelligence, and empathy (Carvalho, Neto, & Mavroveli, 2010; Mullet, Neto & Riviere, 2005). Further, dispositional forgiveness is associated with constructive styles of conflict resolution and problem solving (Rizkalla, Wertheim, & Hodgson, 2008), whilst decreased conflict and increased relational effort has been shown to mediate the relationship between forgiveness and relationship satisfaction (Braithwaite et al., 2011). In research on forgiveness of specific transgressions, forgiveness has been associated with decreased parent-adolescent conflict (Paleari, Regalia, & Fincham, 2003), increased relationship satisfaction and commitment (McCullough et al., 1998), and better marital quality (Paleari, Regalia, & Fincham, 2005).

Although distinct from reconciliation, forgiveness has been shown to assist couples in rebuilding a relationship following infidelity through moving on from bitterness and resentment (Gordon et al., 2004). Similarly, in a longitudinal study, state forgiveness of a recent transgression facilitated the restoration of relationship closeness and commitment over time (Tsang, McCullough, & Fincham, 2006). In addition, the association between forgivingness and relationship quality appears to be at least somewhat reciprocal, as transgressions that occur in already close relationships are more likely to be accompanied by an apology from the offender, higher empathy towards the offender and less rumination about the transgression (Fincham, 2015; McCullough et al., 1998; Tsang et al., 2006).

It is also important to note that evidence of adverse effects of forgiveness also exists (McNulty & Fincham, 2012). For example, McNulty (2011) found that more forgiving partners experienced stable or increasing levels of aggression in the first four years of marriage, whilst less forgiving spouses experienced declines in aggression over the same period. Similarly, Gordon, Burton and Porter (2004) found that forgiveness predicted the intention of women residing at family violence shelters to return to their abusive partners.

Psychological health benefits. Forgiveness is hypothesised to affect psychological wellbeing directly through reduced unforgiveness and the associated reductions in negative affect, including resentment, bitterness, anger and fear (Griffin, Worthington, Lavelock, Wade & Hoyt, 2015; Toussaint & Webb, 2005). Studies conducted to evaluate psychological benefits have included cross-sectional correlational studies, some prospective studies, mediational models, and experimental studies evaluating the psychological health benefits of interventions.

A range of cross-sectional studies have examined this question. Trait forgiveness has been negatively correlated with stress, depression and anxiety (Maltby, Macaskill, & Day, 2001; Messay, Dixon & Rye, 2012; Mullet et al., 2005; Toussaint, Williams, Musick, & Everson, 2001), anger, rumination and hostility (Berry, Worthington, O'Connor, Parrott & Wade, 2005; Mullet et al., 2005) and substance abuse (Kendler et al., 2003; Webb & Jeter, 2015). In the personality domain, forgivingness correlates negatively with traits known to predict poor mental health such as neuroticism, trait anger, and paranoid personality style (Berry et al., 2001; Mullet et al., 2005). In addition to an association with lower levels of negative psychological states, a review of empirical studies also suggested that forgiveness promotes positive mental health (Griffin et al., 2015); for example trait forgiveness has been positively correlated with vitality (Green, DeCourville & Sadava, 2012), and with life satisfaction, positive affect, and optimism (Allemand, Hill, Ghaemmaghami & Martin, 2012; Toussaint et al., 2001).

Prospective studies have shown associations between forgiveness and psychological distress or wellbeing over time. In a study measuring fluctuations in forgiveness, wellbeing, mood and psychosomatic symptoms, reductions in unforgiveness were related to greater wellbeing on the next day (Bono, McCullough, & Root, 2008). Forgiveness of recent hurtful transgressions have also significantly and negatively predicted psychological distress symptoms 36 weeks later (Orcutt, 2006).

Toussaint and Webb (2005) proposed five primary variables which mediate or moderate the relationship between forgiveness and mental health: social support, interpersonal functioning, health behaviours, personal control and rumination. Some evidence supporting this model has accrued (Griffin et al., 2015), including ruminative brooding as a mediator between forgiveness and depressive affect (Ysseldyk, Matheson, & Anisman, 2007), interpersonal commitment moderating the association between forgiveness and negative affect (Karremans, Van Lange, Paul, Ouwerkerk, & Kluwer, 2003), and relationship commitment moderating the association between forgiveness and subjective wellbeing (Bono et al., 2008). In addition, forgivingness has been associated with adaptive attributional processes such as perceptions of increased personal control (Wenzel & Okimoto, 2010; Witvliet et al., 2001). Negative affect and stress have been shown to mediate the relationship between trait forgiveness and mental health among undergraduates (Green, et al., 2012).

Forgiveness intervention studies have also contributed evidence supporting the link between forgiveness and psychological wellbeing. Outcomes of interventions promoting forgiveness include reductions in perceived stress (Harris et al., 2006), reduced depression and anxiety (Brown, 2003; Coyle & Enright, 1997; Freedman & Enright, 1996; W. F. Lin, Mack, Enright, Krahn, & Baskin, 2004), and increases in hope and self-esteem (Al-Mabuk et al., 1995). More recently, people with borderline personality disorder who completed a forgiveness program integrated into a Dialectical Behaviour Therapy (DBT) group program reported significant decreases in attachment anxiety, attachment avoidance, and psychiatric symptoms compared to decreases experienced during the previous DBT module on distress tolerance (Sandage et al., 2015).

A meta-analytic review of 10 forgiveness intervention studies which included psychological wellbeing outcomes concluded that forgiveness interventions were more effective at reducing depression and anxiety and increasing hope than either no treatment or alternative treatments (Wade, Hoyt, Kidwell, & Worthington, 2014), although, as effect sizes were up to

50% lower than those for forgiveness, targeted treatments are still most appropriate where depression or anxiety is the primary concern (Wade et al., 2014). Similarly, another meta-analysis found that forgiveness interventions were associated with reductions in depression, stress, and anger, and increases in positive affect, compared to control groups (Akhtar & Barlow, 2016). Whilst these results support the association between forgiveness and mental health, understanding of direct and indirect mechanisms for the relationship remains limited (Toussaint & Webb, 2005).

Considering direction of effects. Finally, caution should be exercised in attribution of causality as, whilst forgiving may be beneficial, it is also likely that forgiving occurs more readily in the context of positive mental health and life satisfaction. For example, positive personality attributes such as agreeableness moderately predict forgiveness of specific events whilst negative personality styles such as neuroticism or trait anger may impede forgiveness (Riek & Mania, 2012). Increased rumination about recent hurtful transgressions has predicted increased revenge and avoidance motivation regarding the offender on the following day (McCullough, Bono & Root, 2007). Conversely, rumination may actually facilitate forgiveness over time. In a study which recruited participants before a transgression occurred, Wenzel, Turner, and Okimoto (2010) found that rumination in the days following an offence was related to less forgiveness initially, but predicted an increase in forgiveness over time. Thus, event proximal rumination may represent a more adaptive sense-making approach to understanding the transgression (Wenzel et al., 2010). Similarly, an eight-week longitudinal study of 347 adults who had experienced a recent serious interpersonal transgression showed that, whilst psychological adjustment (depression and rumination) predicted change in forgiveness over time, forgiveness did not predict change in psychological adjustment (Orth, Berking, Walker, Meier & Znoj, 2008). Thus it is likely that the association between unforgiveness and poor mental health may be the result of complex bi-directional processes.

Physical health benefits. Similarly, the association between forgiveness and physical health is most likely to involve interactions between direct and indirect mechanisms (Harris & Thoresen, 2005). The human stress response has been associated with a range of negative health consequences including cardiovascular disease, diabetes and the progression of cancer (Larkin, Goulet & Cavanagh, 2015; Sapolsky, 2005). Although exact mechanisms explaining the association between negative emotional states and health are not fully understood, considerable evidence has implicated various components of the physiological response to stress: including the autonomic nervous system, hypothalamic-pituitary-adrenal (HPA) system, and the inflammatory response mediated by the immune system (Larkin et al., 2015; McEwen & Stellar, 1993; Sapolsky, 2005). Forgiveness has been conceived as an emotion-focused approach to coping with stress which promotes physical wellbeing through reduction of health risks and promoting health-related resilience (Worthington & Scherer, 2004), and much recent research into the relationship between forgiveness and health has been driven by stress-coping models of forgiveness (Strelan & Covic, 2006; Witvliet et al., 2015; Worthington, 2006).

In cross-sectional studies, trait forgivingness has been associated with a range of health indicators. In older adulthood, when stress-related disorders are most often evident, self-rated health and positive health behaviours are positively correlated with trait forgivingness (Lawler-Row & Piferi, 2006; Toussaint et al., 2001; Worthington, Witvliet, et al., 2007). Forgivingness has been associated with fewer negative physical symptoms, fewer medications used, better sleep quality, less fatigue and fewer somatic complaints, with the strongest mediator between forgiveness and reduced physical symptoms being reduced negative affect (Lawler et al., 2005). Conversely, limited forgivingness has been associated with higher mortality. In a three-year longitudinal study of 1,232 people aged 66 and older, conditional forgiveness, which refers to the trait of forgiving only when certain conditions are met (e.g., an apology or promise not to reoffend), significantly predicted mortality after controlling for religious, socio-demographic and health behaviour variables (Toussaint, Owen & Cheadle, 2012). Indirectly, trait forgivingness is

hypothesised to support good physical health through co-variance with other traits known to impact on health, such as high positive affect, good mental health, social support, health behaviours and good relationship skills (Lawler et al., 2005; Worthington & Scherer, 2004; Worthington, Witvliet, et al., 2007).

Many studies have suggested that forgiveness is associated with attenuated physiological stress responses (Larkin et al., 2015). Forgiveness is theorised to have direct effects upon health via reduced unforgiveness, given the association between hostility, anger, and other negative emotions and poor health outcomes (Harris & Thoresen, 2005; Larkin et al., 2015; McEwen & Stellar, 1993; Worthington & Scherer, 2004). A review of laboratory cardiovascular reactivity studies suggests that unforgiving responses towards others generate more negative and aroused affect, greater reactivity, and more prolonged activation than forgiving responses towards others (Witvliet, 2005). Although it is unclear whether brief peaks in blood pressure exert long term organ damage, it has been proposed that unforgiveness prolonged by angry rumination and avoidance behaviours may contribute to the prolonged physiological activation which is theorised to have more cardiovascular health implications than short term stress reactivity (Worthington, Witvliet, et al., 2007). It is also possible that unforgiveness affects the body's protection against a range of diseases, since negative emotions can cause dysregulation of the immune system at the cellular and neuroendocrine levels (Worthington & Scherer, 2004). Consistent with this hypothesis, one study noted that production of salivary cortisol is elevated in people high in trait unforgiveness (Berry & Worthington, 2001), whilst another found support for an association between forgiveness and lower cortisol reactivity during a Stroop task (Tartaro, Luecken, & Gunn, 2005). However, other findings have not supported an association between forgiveness and immune system functioning (Larkin et al., 2015).

Forgiveness interventions have also been used to promote physical health in addition to forgiveness. Elliott (2011) advocates for forgiveness interventions for people suffering from chronic illnesses, citing the association between early childhood deprivation, abuse, or

abandonment and chronic diseases including heart disease, diabetes, asthma, and lung disease. Forgiveness therapy has been associated with improvements in overall fibromyalgia health (Lee & Enright, 2014) and decreases in anger induced myocardial perfusion defects in cardiac patients (Waltman et al., 2009). In the elderly, research has also shown an association between intervening to promote forgiveness and improvement in perceived health status (Ingersoll-Dayton, Campbell, & Ha, 2009) and in willingness to persist with physical rehabilitation exercises (Lavelock, Griffin, & Worthington, 2013).

Summary of forgiveness benefits. In summary, forgiveness, especially the tendency to forgive across a range of situations, is associated with a range of social, psychological, and physiological wellbeing factors. These associations are commonly attributed to the absence or reduction of prolonged unforgiveness, as strong evidence suggests a causal relationship between negative emotions and poor mental and physical health (Griffin et al., 2015; Harris & Thoresen, 2005; Larkin et al., 2015; McEwen & Stellar, 1993). However, these links should not be overstated as there are strong indicators that relationship factors and individual differences moderate the relationship between forgiveness and health (Fincham, 2015; Green et al., 2012) and of interactions between mental and physical health and forgiveness (Griffin et al., 2015).

Finally, whilst mounting evidence supports the notion that forgiveness is beneficial, it is important to acknowledge that many people find other ways to resolve the anger, fear, and distress that follow interpersonal transgressions or betrayals. These include successfully taking revenge, saving face by denying hurt feelings, or cognitively reframing the event to explain or excuse the offender's actions (Wade & Worthington, 2003). Alternatively, victims of serious offences may gain resolution of their suffering by seeing justice restored through obtaining fair compensation or seeing a reasonable punishment imposed (Wade & Worthington, 2003; Wenzel & Okimoto, 2010) or obtain satisfaction through the experience of principled resentment (Exline et al., 2003).

Nevertheless, the strength and breadth of the association between forgiveness and wellbeing suggest that the development and implementation of forgiveness interventions to assist people in learning how to be more forgiving is a worthwhile endeavour. In particular, it is important to examine changes in stress and mental health when conducting forgiveness interventions to assess potential iatrogenic effects and to further knowledge about the potential benefits of forgiveness.

Factors Associated with Forgiving Specific Transgressions

Since the ability to forgive is associated with such distinct psychological and physical health benefits, researchers have increasingly turned their attention to factors other than trait forgiveness which predict forgiveness of a specific offence, or state forgiveness. In this section, correlational evidence for factors associated with forgiveness will be reviewed against a schematic which has been proposed to explain the interplay between dispositional and contextual factors in forgiving specific transgressions. Evidence from two substantial meta-analyses (Fehr et al., 2010; Riek & Mania, 2012) will be considered along with relevant original studies. In addition, the limited longitudinal and experimental research investigating predictors of state forgiveness will be reviewed.

Cross-sectional research. McCullough and colleagues (1998) differentiate four broad categories of forgiveness determinants, ranging from distal to proximal, with proximal determinants theorised to be most causally influential on forgiving in specific circumstances. This distal-proximal model of forgiveness determinants is summarised in Figure 1. The most distal predictors are theorised to include personality traits or embedded beliefs that dispose people to general styles of emotional or cognitive responding, for example with anger, blame or understanding (McCullough et al., 1998). Personality traits most strongly associated with forgiving specific offences are agreeableness and neuroticism, with the latter predicting lower

levels of forgiveness (Fehr et al., 2010; Koutsos, Wertheim, & Kornblum, 2008). Trait empathy, both perspective taking and empathic concern, has also been associated with greater forgiveness in meta-analyses (Fehr et al., 2010; Riek & Mania, 2012), whilst trait anger is negatively correlated with forgiveness (Fehr et al., 2010).

Somewhat less distal are relational determinants of forgiving, which refer to qualities of the interpersonal relationship which provide the context of the transgression. Victims are believed to be more likely to forgive offenders within relationships perceived as close, satisfying and committed; perhaps motivated by the desire to restore closeness or preserve the relationship (McCullough et al., 1998). As noted earlier, the positive association between marital relationship quality and forgiveness may be reciprocal (Fincham, Paleari, & Regalia, 2002; Paleari et al., 2005). Meta-analytic evidence also supports significant positive associations between relationship closeness, commitment and satisfaction and forgiveness of specific offence (Fehr et al., 2010).

Dispositional level	**Relationship level**	**Offense level**	**Social-cognitive level**
Agreeableness	Closeness	Severity	State empathy
Neuroticism	Commitment	Apology	Rumination
Trait forgiveness	Satisfaction		Attributions (intent)
Trait empathy	Relationship quality		Attributions (responsibility)
Religiosity			
Trait anger			State anger
←–––––––––––––––––––– ***Distal – Proximal Axis*** ––––––––––––––––––––→			

Figure 1. Factors determining forgiveness of a specific interpersonal transgression. Factors are categorised according to the distal-proximal schematic proposed by McCullough, Rachal, Sandage, Worthington, Brown & Hight (1998). Factors included in the diagram are those supported as correlates by significant weighted mean correlation coefficients in meta-analyses (Fehr, Gelfand, & Nag, 2010; Riek & Mania, 2012).

More proximally, forgiveness is also predicted by variables related to the actual offense. Transgressions which are perceived as more severe appear to be more difficult to forgive, and are associated with lower rates of state forgiveness (Fehr et al., 2010; Fincham, Jackson, & Beach, 2005; Riek & Mania, 2012). However, the behaviour of the offender following the transgression also influences forgiveness; thus greater forgiveness is associated with apology, perceived remorse or attempts to compensate for damage caused (Davis & Gold, 2011; Fehr et al., 2010; Koutsos et al., 2008; McCullough et al., 1997; Riek & Mania, 2012; Ristovski & Wertheim, 2005). Further, people may be more forgiving if they believe an offender has been punished (Fitness & Peterson, 2008; Strelan & van Prooijen, 2013).

Finally, and theoretically most proximal, social-cognitive determinants of forgiving involve the victim's affective response and interpretation of the offense. In accordance with theoretical links between empathy for the offender and forgiveness (Enright & Fitzgibbons, 2000; Worthington 1998b), state affective empathy has been strongly correlated with state forgiveness (Fehr et al., 2010; Riek & Mania, 2012; Tsang & Stanford, 2007). Rumination about the offence or offender, as well as state anger regarding the offence, are negatively associated with forgiveness (Fehr al., 2010; Wade, Vogel, Liao, & Goldman, 2008). The offended person's attributions about the offender are also associated with forgiveness. For example, inferring that offenders' actions were deliberately hurtful, or that they were responsible for their actions, is negatively associated with forgiveness; whilst attributing non-malicious intent predicts greater forgiveness (Blatt & Wertheim, 2015; Fehr et al., 2010; Riek & Mania, 2012). Recent research has established the validity of a multi-factorial model and measure of social-cognitive factors that facilitate or inhibit state forgiveness (the Factors Related to Forgiveness Inventory; FRFI), including positive post-transgression offender responses, perceived likelihood of the offender reoffending, attributions of non-malicious intent, relationship value, spiritual beliefs, social influences not to forgive, and believing that forgiveness would be condoning or excusing the offence (Blatt & Wertheim, 2015; Koutsos et al., 2008). In multiple regression analyses, each of

the seven social-cognitive factors contributed unique variance to the prediction of state forgiveness (Blatt & Wertheim, 2015).

In a meta-analysis of 103 studies, Riek and Mania (2012) predicted that theoretically more proximate influences on forgiveness would have stronger correlations with forgiveness than more distal factors. Their hypothesis was only partially supported, as although overall effect sizes for the most proximal influences on forgiveness tended to be larger than for the more distal influences, this was not always the case (Riek & Mania, 2012). However, in this meta-analysis, mean correlations for most factors were based on state and trait forgiveness studies combined. An earlier meta-analysis conducted by Fehr and colleagues (2010), which included 175 studies of state forgiveness (i.e., excluding trait forgiveness studies), found that situational factors accounted for greater variance in forgiveness than dispositional factors.

Recognising that factors associated with specific acts of forgiveness are unlikely to operate in isolation, forgiveness theorists have proposed that theoretically proximal factors may mediate the influence of more distal dispositional and relationship factors. (McCullough et al., 1998; Riek & Mania, 2012; Worthington, 1998b). For example, apologies may be more likely in relationships characterised by closeness and commitment, or people high in neuroticism may be more likely to ruminate about interpersonal transgressions. Several studies have explored mediational models which provide evidential support for this hypothesis. McCullough and colleagues described empathy as “the governor of forgiving”, arguing that associations of more distal variables with forgiveness were substantially mediated by empathy (1998, p. 1588). Affective empathy has been shown to mediate the relationship between apology and forgiveness (McCullough et al., 1998), between marital quality and forgiveness (Paleari et al., 2003), and between believing oneself capable of a similar offence and forgiveness (Exline, Baumeister, Zell, Kraft, & Witvliet, 2008). However, research has also shown that both distal and proximal factors may contribute unique variance to forgiveness when considered together. For example, dispositional forgiveness has predicted state forgiveness after accounting for multiple

transgression specific variables (Blatt & Wertheim, 2015; Koutsos et al., 2008) and structural equation modelling found pre-offense relationship closeness predicted forgiveness both directly and indirectly via apology and empathy (McCullough et al., 1998).

Experimental and longitudinal research. Research establishing longitudinal and causal relationships between putative predictive factors and forgiveness of specific transgressions has been limited. Studies exploring intra-individual changes in forgiveness over time have found that reductions in avoidance and revenge motivation are associated with concurrent reductions in rumination, with cross-lagged analyses suggesting that increased rumination preceded increased unforgiveness (McCullough et al., 2007; McCullough & Root, 2005). Scenario methods have evaluated predictors of forgiveness by exposure to hypothetical transgressions and manipulating participants' levels of predictor variables. Using such methods, Ristovski and Wertheim (2010) found evidence suggesting that people who receive financial compensation following a non-violent offense may subsequently be more forgiving of their offender. They also found that conciliatory gestures by offenders were more likely to facilitate forgiveness in victims when they are voluntary (Ristovski & Wertheim, 2010). These findings support a causal link between positive post-offense responses by the offender, such as apologising or offering appropriate restitution, and forgiveness. In an experimental study, Exline and colleagues (2008) found that when people were asked to recall an offense they committed which was similar to the offense committed against them, they found the target offense easier to understand and were subsequently more forgiving than people in a control condition (i.e., not recalling a similar offense). This study provided evidence suggesting that a sense of personal capability to hurt others, similar to humility, predicted greater empathy and forgiveness.

In summary, research undertaken thus far indicates that factors proximal to the transgression, as well as more distal factors influencing responses to the transgression, may act in complex ways to determine an individual's capacity to forgive a specific transgression. The current research will utilise measures of both distal factors, such as selected personality traits

and individual differences related to forgiveness, and more proximal offense-related and social-cognitive factors to assess the influence of such factors in the context of a forgiveness intervention.

Intervening to Promote Forgiveness of a Specific Offence

Given the benefits of forgiveness, psychologists have developed structured interventions to promote forgiveness and assist people to overcome unforgiveness. Forgiveness interventions based upon diverse theoretical models of forgiveness have been effective in promoting forgiveness of interpersonal transgressions (Wade et al., 2014). The main forgiveness interventions will be outlined in this section, and supporting evidence for their effectiveness will be appraised. Finally, the main findings of key meta-analyses of forgiveness intervention studies will be reviewed.

Interventions Based on Process Models of Forgiveness

In the theory section of this chapter, process theories were introduced. In this section, interventions based on those theories are described. Specifically, research groups led by Robert Enright and Everett Worthington have conducted extensive investigations of interventions based on their process theories of forgiveness (Wade et al., 2014) and these will be reviewed. As the focus of the present thesis will be on Worthington's REACH model, a more detailed discussion is undertaken for that approach.

Enright group process model. Enright and colleagues (Enright et al., 1991; Enright & Fitzgibbons, 2000) proposed 20 units in a process model of forgiveness therapy based upon the cognitive-developmental theory of forgiveness described earlier. The 20-unit model is typically divided into four distinct phases: 1) *uncovering*, in which the injured person explores the pain and anger associated with the transgression and the way that the event has impacted on his or her life; 2) *deciding to forgive*, including the acknowledgement that current coping strategies may not be helpful, exploring willingness to consider forgiveness and making a commitment to

forgive the offender; 3) *working*, in which the person reframes the event and the offending person in context, accepts the pain that has been suffered and may develop empathy and compassion for the offender; and 4) *outcome or discovery*, including the realisation that healing is experienced through the gift of forgiveness to the offender, recognition of one's own past need for forgiveness, and exploring the meaning of the experience of being hurt and forgiving (Enright, 2001; Freedman, Enright, & Knutson, 2005). Although the 20 units are presented as a series of tasks, or a "cognitive map" for practitioners and clients, individuals may skip, repeat or attend to unit tasks in their own sequence (Enright & Fitzgibbons, 2000). Overall, the intent of tasks in the Enright model is to assist the client to progress through the stages of moral development as expressed through an understanding of forgiveness. Mature forgiveness is construed as a response to the wrongdoer encompassing compassion, unconditional worth, and moral love (Enright & Fitzgibbons, 2000).

Interventions based on the Enright group model have achieved broad empirical support. To date over 20 intervention studies have been published (Wade et al., 2014), with findings indicating that the model provides an effective basis for helping people forgive interpersonal transgressions. Compared to other forgiveness approaches, Enright's model has been studied extensively as an individual intervention, providing a useful evidence base for consideration by psychotherapists. For example, intervention studies have been conducted with sexually abused women (Freedman & Enright, 1996), emotionally abused women after separation (Reed & Enright, 2006), men hurt by their partner's abortion decision (Coyle & Enright, 1997), substance dependent adult inpatients (W. F. Lin et al., 2004), women with fibromyalgia abused in childhood (Lee & Enright, 2014) and men with coronary artery disease (Waltman et al., 2009). Individual interventions have tended to be offered in weekly sessions, with treatments lasting for as long as sixteen months (Freedman & Enright, 1996), but also for more limited time periods such as 10 weeks (Waltman et al., 2009) or twice weekly over six weeks (W. F. Lin et al., 2004), indicating

the flexibility of the model which has been offered in both community based and inpatient settings.

Individual interventions allow for people who have experienced more severe transgressions to work through the stages of the model in their own time. For example, in an early randomised controlled study of 12 women who had been sexually abused in childhood by a male relative, participants continued the intervention until they had reached forgiveness, taking from 10 to 16 months to do so (Freedman & Enright, 1996). Compared to waiting list controls, participants who had completed forgiveness therapy showed significantly greater gains in forgiveness and hope, and reductions in depression and anxiety (Freedman & Enright, 1996). In a later study the model was adapted to provide a much briefer individual intervention in an inpatient setting. Fourteen substance dependent inpatients in a residential drug treatment facility were randomised to receive individual forgiveness treatment or routine drug and alcohol therapy (W. F. Lin et al., 2004). After 12 sessions delivered twice weekly, the forgiveness treatment group showed significantly greater improvement from pre- to post-treatment in forgiveness, anxiety, depression, anger, self-esteem, and drug use compared to the control group (W. F. Lin et al., 2004).

The Enright group process model has also provided the basis for group interventions. As for the individual studies, evaluations of group applications of Enright's model have examined the effects of promoting forgiveness in diverse clinical and community populations, including elderly men and women (Hebl & Enright, 1993; Ingersoll-Dayton et al., 2009), adolescents adjusting to divorce (Freedman & Knupp, 2003), parentally-love-deprived college students (Al-Mabuk et al., 1995), adult children of alcoholics (Osterndorf, Enright, Holter, & Klatt, 2011), Hong Kong Chinese schoolchildren offended by peers (Hui & Chau, 2009), and Taiwanese young adults with insecure attachment (W. N. Lin, Enright & Klatt, 2013). In what is possibly the earliest controlled study of a forgiveness intervention, Hebl and Enright (1993) found that elderly women who attended a forgiveness group had significantly higher forgiveness scores at post-test

compared to an active control group (Hebl & Enright, 1993). More recently, Taiwanese university students with insecure maternal attachment and high levels of depression and anxiety were randomly allocated to a 12-week group forgiveness program or a communication intervention (W. N. Lin et al., 2013). Although both groups showed improvements, within-group analyses indicated that forgiveness group participants reported greater improvements in forgiveness, attachment security, trait anxiety, hope, and self-esteem, with medium to large effect sizes.

Whilst most studies indicate the effectiveness of the model at increasing forgiveness compared to non-treatment or alternative treatment controls, researchers investigating applications of the Enright group model have been leaders in gathering evidence for the positive effects of forgiveness interventions on psychological wellbeing (Freedman & Enright, 1996; W. F. Lin et al., 2004; Reed & Enright, 2006) and physical health measures (Ingersoll-Dayton et al., 2009; Lee & Enright, 2014; Waltman et al., 2009). Taken together, the studies evaluating individual and group applications of the Enright process model of forgiveness therapy represent a significant, and early, recognition of the possibilities of forgiveness interventions improving physical and psychological wellbeing in addition to the target forgiveness outcomes. The effectiveness of the Enright-based interventions relative to other theoretically-based forgiveness interventions will be assessed in the later section reviewing meta-analyses of forgiveness interventions.

REACH, the Worthington group process model. The other significant research group has organised investigation of forgiveness interventions around Worthington's (2001) REACH forgiveness model, which is a further development of the pyramid model of forgiveness discussed earlier. REACH is an acrostic with each letter representing a key component in the forgiveness process. Following an introductory period in which forgiveness is defined, and cultural and personal beliefs about forgiveness are explored and challenged, participants are invited to *recall (R)* the hurt and other emotions associated with the transgression. Second, participants work to develop *empathy (E)* for the offender by attempting to understand the

other's perspective and the factors which may have contributed to their actions without condoning their behaviour or invalidating the victim's emotional response. Third, forgiveness is promoted as an *altruistic (A)* response to the offender based upon the participant's own experiences of being forgiven. The fourth component explicitly acknowledges forgiveness as a process which takes time to mature, encouraging participants to make a *commitment (C)* to maintain the forgiveness already achieved whilst also continuing to work towards more forgiveness. Last, participants develop strategies to *hold (H)* or maintain their forgiveness, especially during periods where they are reminded of their hurt or anger (Worthington, 2001; Worthington, Lavelock, & Scherer, 2012). In relation to the distal-proximal framework of factors influencing forgiveness, it can be seen that REACH focuses on proximal social-cognitive factors such as state empathy, rumination, and managing emotions associated with the offense. The intended outcome of the program is for participants to experience the transition from decisional forgiveness, which they may already be experiencing in order to engage in the REACH program, to emotional forgiveness. The REACH program is organised into a six-module structure, which incorporates psychoeducation and reflective exercises addressing the five REACH components in sequence.

Eighteen empirical studies investigating the effectiveness of the REACH model have been published to date, and data from additional research studies have been included in meta-analyses (Wade et al., 2005; Wade et al., 2014; see later section for a review). Summary findings of the empirical studies which evaluate applications of the REACH model are included in Table 1. The REACH program is typically offered as a psychologist-facilitated group program in either secular or Christian versions, the latter containing exercises involving scriptural reading and prayer. REACH is designed for delivery over 6 one-hour sessions but has also been evaluated in one-day formats (Y. Lin et al., 2014; Stratton, Dean, Nonneman, Bode, & Worthington, 2008) and over longer periods such as 12 hours over eight weeks (Rye et al., 2005). An adaptation of the REACH program for couples, which includes additional material on reconciliation, has been

evaluated in a study for community-based couples attending 6 hours of group counselling in a weekend (Ripley & Worthington, 2002), and for newly married couples attending nine hours of consultation over four weeks (Worthington et al., 2015). Of most relevance to the present research are two recent research studies which evaluate the effectiveness of REACH in self-directed workbook format for individuals (Greer, Worthington, Y. Lin, Lavelock & Griffin, 2014; Harper et al., 2014).

Table 1

Empirical Studies Investigating the Effectiveness of the REACH for Forgiveness Intervention

Authors	*Participants*	*N*	*Experimental conditions*	*Key findings*
Group intervention studies				
Rye and Pargament (2002)	Female, Christian, university students. Distress related to romantic partner	58	Random assignment to 3 groups: • Secular Forgiveness (SF) • Religiously Integrated Forgiveness (RIF) • No treatment control (both treatments based on REACH) 6 x 1.5 hr weekly sessions	No effect sizes reported. Participants in forgiveness treatment groups improved significantly more than controls in state forgiveness and forgiveness knowledge (maintained at 6-week follow-up). No group differences found for forgiveness likelihood (ie. transfer of forgiveness to other situations).
Lampton, Oliver, Worthington & Berry (2005)	Students at a Christian university participating in a program to develop Christian character	65	Allocated by participant preference to two conditions: • REACH (Christian version; *n* = 42) • Test-Retest control (*n* = 23) 6 x 1 hr sessions over 3 weeks TFS, F-PRO, TRIM (Revenge, Avoidance)	Pre-post comparison effect sizes in brackets (Cohen's *d*). Forgiveness group made significantly greater improvements in avoidance motivation and positive forgiveness responses, but not in revenge, than control group. Large effect when combining all forgiveness measures (.61). Trait forgiveness was also measured pre- and post-test, with no significant changes observed in either group.
Rye et al. (2005)	Community adults responding to call for people wishing to learn how to cope with divorce through forgiveness.	149	Random assignment to 3 groups: • Secular Forgiveness (SF) • Religiously Integrated Forgiveness (RIF) • No treatment control (NT) 8 x 1.5 hr weekly sessions (both treatments based on REACH steps)	Comparison effect sizes in brackets (dummy coefficient of the grouping variable divided by individual level *SD*, analogous to Cohen's d). SF and RIF groups had significantly higher growth rate (pre-test to follow-up) in forgiveness (3.31, 3.32), forgiveness knowledge (2.70, 2.88) than NT. SF participants had significantly lower growth rates in depression (-2.79) than NT.

Authors	*Participants*	*N*	*Experimental conditions*	*Key findings*
Stratton, Dean, Nonneman, Bode, & Worthington (2008)	Undergraduate students at a Christian college	114	Allocated to four conditions based on class enrolment: • 5-6 hour REACH Forgiveness workshop, Christian version (W; *n* = 22) • Forgiveness Essay task (E; *n* = 46) • Workshop & Essay (W+E; *n* = 17) • Control (C; *n* = 46) Participants completed measures at Week 1 (pre-test), 4 (post-test) and 10 (6-week follow-up). TFS, TRIM (Revenge, Avoidance, Conciliation), F-PRO	Positive responses to offender (TRIM-C and F-PRO): W+E had greater effect on forgiveness at post-test than W, but not E or C. Difference between W+E and W were not significant at follow-up. Negative responses to offender (TRIM-R, -A): No differential response in four groups. TFS used as covariate: Significantly related to positive and negative responses to offender.
Shechtman, Wade, & Khoury (2009)	Arab Israeli adolescents from public schools in Israel	146	Random allocation to: • REACH group (*n* = 65) • Control (classroom social discussion; *n* = 81) REACH adapted for adolescents, forgiveness of Jewish society. 12 weekly sessions; 3-mth follow-up TRIM (Revenge, Avoidance)	Treatment group reported significant improvements in revenge, avoidance, hostility, empathy and endorsement of violence than control group from pre- to post-treatment, and from pre-treatment to follow-up; all changes significantly greater than control group. Control group also made significant gains in empathy and reductions in aggression.

Authors	*Participants*	*N*	*Experimental conditions*	*Key findings*
Wade, Worthington, and Haake (2009)	Psychology undergraduates	144	RCT, three conditions: • REACH • Partial REACH (empathy component removed) • Stress reduction Each treatment delivered for 6 hours. TRIM, BEA	Pre- to post-treatment Effect sizes in brackets for REACH, Part REACH, Stress reduction; Effect size = M_{pre}-M_{post}/SD_{pre}): Unforgiveness: Significantly reduced in all groups (.**50, .30, .41**). Equivalent clinical improvement across all groups, approx. 30% participants helped. Forgiveness: Sig. increase in both REACH groups (.**54, .69**, .33). Empathy: Non-significant increase in all groups (.17, .07, .28).
Wade and Meyer (2009)	Community-based adults	35	Random allocation to three conditions: • REACH • Process-oriented group therapy (POGT) • Wait-list (WL) Treatments delivered over 6 hours. TRIM-R, RFS, BEA, BSI	Pre- to post-treatment Effect sizes in brackets for REACH, POGT, WL; Cohen's *d;* significant effects in boldface: Revenge: Treatments reduced revenge significantly more than WL (.**77, .52**, .02). Absence of negative motivations: Treatments reduced negative motivations sig more than WL. No sig diff between treatments (possible Type II error, small sample size) (**1.46, .67**, .19). Psychiatric symptoms: Treatments sig more effective at reducing symptoms (.**70, .97**, .13). No significant change over time in any group for empathy (.08, .41, .17) or positive motivations: (.08, .42, .06).
Blocher and Wade (2010)	Community-based adults, follow-up of Wade & Meyer (2009) cohort	16	2-year follow-up Comparison of REACH and Process-oriented group therapy (POGT) groups	No significant main effect for group on any measure. Effect sizes: Pre- to-follow-up treatment (Post- to-follow-up treatment in brackets); Cohen's *d*: *Revenge*: -0.55 (0.19); Avoidance: -0.25 (0.21). *Absence of negative motivations*: 2.65 (1.12).

Authors	*Participants*	*N*	*Experimental conditions*	*Key findings*
				Presence of positive motivations: -0.16 (-0.33) . *Psychiatric symptoms*: -0.78 (-0.10).
Sandage & Worthington (2010)	Undergraduate students	97	RCT, 3 conditions: • Empathy forgiveness seminar (EF; *n* = 32) • Self-enhancement seminar (SE; *n* = 30) • Wait list control (WL; *n* = 36) Enright Forgiveness Inventory (EFI) Batson's Empathy Adjectives (BEA)	Repeated measures ANCOVA (post-test, follow-up, pre-test scores as covariate). No effect sizes reported. *Forgiveness*: Both seminar groups significantly greater increases than wait list control. *Empathy*: Both seminar groups reported significantly greater increases than WL. *Psychiatric symptoms*: No effect of condition or time. Increases in affective empathy for the offender mediated change in forgiveness scores (regardless of seminar condition), replication of McCullough et al. (1997).
Goldman and Wade (2012)	University students	81	RCT 3 conditions: • REACH • Anger reduction group (AR) • Waitlist control (WL) Treatments included 6 x 1.5 hr sessions over 3 weeks.	Pre- to post-treatment (Effect sizes in brackets for REACH, AR, WL; Cohen's *d*): *Revenge* - REACH reduced sig more than AR & WL (.49, .24, .29). *Rumination* – Reduced in all groups (.51, .47, .47) *Hostility* - REACH reduced sig more than AR and WL (.81, .57, .35) *Psych symptoms* – REACH reduced sig more than AR and WL (.51, .17, .17). Clinically signifcant improvement *Empathy* – REACH increased sig more than AR & WL (.21, -.37, -.37). Clinical significance

Authors	*Participants*	*N*	*Experimental conditions*	*Key findings*
Allemand, Steiner and Hill (2013)	Older adults Mean age 70.1 years (*SD* = 7.7) Switzerland	78	RCT, 2 conditions: • immediate treatment (IT) • waitlist control (WC) 4-week follow-up Treatment included 2 x 3.5 hour group sessions. Two components added to enhance REACH for older adults.	<u>Pre- to post-treatment and follow-up (IT vs. WC)</u> (effect sizes in brackets, Cohen's *d*). *Avoidance*: significant effect (.23), maintained at follow-up (.37). *Revenge, benevolence*: No effect. *Perceived transgression painfulness*: significant effect (.07) increased at follow-up (.72). *Negative affect*: approached significance (.40) maintained at follow-up (.46). *Positive affect*: non-significant. *Transgression related cognitions and emotions* (sadness, rumination, humiliation, emotional pain): significant effects (.17 to .47) maintained at follow-up (.45 - .67).
Y. Lin et al. (2014)	Female university students.	72	RCT, two conditions: • immediate treatment (IT) • waitlist control (WC) 2-week follow-up Secular version of REACH, delivered in single session of 6 hours. Groups had equal proportions of "foreign extraction" (born outside USA or first generation born to overseas born parents) and domestic students (born in USA)	<u>Pre- to post-treatment and two-week follow-up</u> *Emotional forgiveness*: Greater improvements for IT group relative to WC, maintained at follow-up. *Decisional forgiveness*: No effects. WC participants made similar gains after receiving the intervention. <u>Influence of culture on intervention response</u> *Collectivistic self-construal*: Foreign extraction students significantly more collectivistic than domestic students. *Individualistic self-construal*: No group differences. Country of extraction was unrelated to (i.e., did not moderate) post-treatment forgiveness scores.

Authors	*Participants*	*N*	*Experimental conditions*	*Key findings*
Sandage et al. (2015)	Adults with BPD receiving outpatient DBT	40	Quasi experimental pre-test design REACH program integrated as a module within a standard DBT group protocol Four time points: • T1 Pre-previous DBT module (distress tolerance) • T2 Pre-REACH module • T3 Post-REACH module • T4 Six-week follow-up REACH adapted for relevance to BPD clients, administered as 4 x 2 hour weekly psychoeducational group sessions (followed standard DBT format)	<u>Pre- to post-treatment</u> (Effect sizes in brackets; Cohen's *d*). Significant improvements following REACH module in forgiveness measures; revenge (.53), avoidance (.92), benevolence (.71), decisional forgiveness (1.18), emotional forgiveness (1.33) and trait forgiveness (.71). Significant decreases following REACH module in attachment anxiety (.79), attachment avoidance (.42) and psychiatric symptoms (.51). <u>Six-week follow-up</u> All treatment gains maintained to follow-up except for attachment avoidance. <u>Mediation analyses</u> Anxious attachment mediated change in benevolence. Trait forgiveness mediated change in psychiatric symptoms.
Couple intervention studies				
Ripley & Worthington (2002)	Married couples, Community respondents to advertisement for marital enrichment course	43	Random assignment to 3 conditions: • Hope-focused marital enrichment (HOPE) • Empathy-based forgiveness marital enrichment (EMP; early version of REACH) • Wait-list control (WL)	Participants in both treatment groups improved significantly on positive marital communication (observer reports) compared to controls. No group differences on forgiveness, marital satisfaction or marital communication (self-report measures).

Authors	*Participants*	*N*	*Experimental conditions*	*Key findings*
Worthington et al., 2015	Newly married couples (married between 6-9 months) Community based, responded to advertisements, received monetary incentive	145	Random assignment to 3 conditions: • HOPE treatment (*n* = 47) • FREE treatment (incorporates REACH; *n* = 49) • Assessment only control (*n* = 49) 9 hour treatments Assessments at pre-treatment, 1-month post-treatment, and 3-, 6- and 12-months post-treatment. TRIM, BEA	Only HOPE treatment significantly improved relationship quality; FREE participants showed only modest improvement in relationship quality at 12 months. Both treatment groups improved on forgiveness and empathy. Both treatment groups showed reduced cortisol reactivity at post-treatment. Maintenance at follow-up was better for HOPE than for FREE participants.
Self-directed workbook intervention studies				
Greer, Worthington, Lin, Lavelock and Griffin (2014)	University students Christian faith Within-congregation offences	52	RCT, 2 conditions: • immediate treatment (IT; *n* = 25) • waitlist control (WC; *n* = 27) 1-week follow-up (at this time WC had also completed intervention) Self-directed workbook adaptation of REACH (Christian version) completed over two weeks (estimated 6 hour completion)	Pre- to post-treatment (IT vs. WC) effect sizes (Cohen's *d*). *TRIM* (Avoidance and revenge combined): 1.37 *Decisional forgiveness*: 1.2 ; *Emotional forgiveness*: 1.25 Treatment gains similar for WC after completing intervention. Comparison to benchmark change scores for group intervention Pre- to post-treatment change (TRIM) for workbook intervention (current study) was not significantly different to mean change scores derived from three published RCTs in which REACH was administered as a group intervention.

Authors	*Participants*	*N*	*Experimental conditions*	*Key findings*
Harper et al. (2014)	University students Volunteers, received course credit for participating	41	RCT, 2 conditions: • immediate treatment (IT; *n* = 20) • waitlist control (WC; *n* = 21) 2-week follow-up (at this time WC had also completed intervention) Self-directed workbook adaptation of REACH completed over two weeks (estimated 6 hour completion)	Pre- to post-treatment (IT vs. WC) effect sizes (Cohen's *d*) *TRIM* (Avoidance and revenge combined): -.56 *Decisional forgiveness*: .45 ; *Emotional forgiveness*: .50 *Rye Forgiveness Scale*: .69 Treatment gains similar for WC after completing intervention. 2-week follow-up IT group maintained post-treatment gains at follow-up on all measures. Comparison to benchmark change scores for group intervention Pre- to post-treatment change for workbook intervention (current study) was nearly twice as large as mean change scores derived from seven published RCTs in which REACH was administered as a group intervention.

Note. Studies included are those discussed in the text, categorised by delivery format (group, couple, self-help) then in chronological order by year of publication. All participants are US residents unless stated otherwise. Effect sizes of forgiveness outcomes or other significant findings are included where available. BEA = Batson's Empathy Adjectives; BPD = Borderline Personality Disorder; BSI = Brief Symptom Inventory; DBT = Dialectical Behaviour Therapy; EFI = Enright Forgiveness Inventory; FREE = Forgiveness and Reconciliation through Experiencing Empathy; F-PRO = Forgiveness Positive responses to the Offender; HOPE = Handling Our Problems Effectively; RCT = Randomised controlled trial; REACH = process-based forgiveness intervention developed by Worthington (2001) and others; TFS = Trait Forgiveness Scale; TRIM = Transgression Related Interpersonal Motivations.

Studies of the group-based REACH intervention have demonstrated moderate to large effect sizes in increasing forgiveness or reducing unforgiveness related to interpersonal transgressions in state university students (Goldman & Wade, 2012; Y. Lin et al., 2014; Sandage & Worthington, 2010; Wade et al., 2009), Christian university students (Lampton, Oliver, Worthington & Berry, 2005; Rye & Pargament, 2002; Stratton et al., 2008), community based adults (Wade & Meyer, 2009), people recovering from divorce (Rye et al., 2005), and integrated within a standard DBT group protocol for adults with Borderline Personality Disorder (Sandage et al., 2015). Studies have compared the effectiveness of REACH with alternative programs and assessment only controls. A comparison of the REACH program with a psychotherapy group and wait-list control found that both treatments were effective at reducing psychological symptoms and unforgiveness (Wade & Meyer, 2009), with effectiveness of the treatments maintained for two years (Blocher & Wade, 2010). Similarly, a larger randomised controlled trial compared REACH, REACH (empathy component removed), and stress reduction (Wade et al., 2009). Unforgiveness was significantly reduced in all groups, whilst forgiveness increased in both REACH groups (Wade et al., 2009). In another study, participants in a REACH group demonstrated significantly reduced revenge motivation and hostility and clinically significant improvement in psychological symptoms compared with an anger reduction group and a wait-list control, with pre-post effect sizes ranging from .49 to .81 (Goldman & Wade, 2012). These studies demonstrate that REACH may be as effective as other psychological interventions for alleviating unforgiveness.

Whilst much of the REACH evidence based has been acquired from US based samples, a recent study of 72 female university students examined the influence of culture on responses to a full-day REACH program (Y. Lin et al., 2014). Both domestic and foreign extraction students showed significant increases in emotional forgiveness compared to waitlist controls, and country of extraction was unrelated to post-treatment forgiveness scores (Y. Lin et al., 2014). The REACH steps have also been incorporated into a forgiveness intervention for elderly people residing in

Switzerland which also included psychoeducational components addressing the value of reflecting on the impact of past transgressions and of the role of emotions in understanding past transgressions (Allemand, Steiner, & Hill, 2013). This study reported significantly greater reductions in avoidance motivation, rumination, and emotional pain compared to waitlist controls, effects which were maintained at four-week follow-up (Allemand et al., 2013). In contrast to most forgiveness interventions which focus on helping participants forgive an individual offender for a specific transgression, one adaptation of REACH was used in a study evaluating a classroom-based program to encourage Arab Israeli adolescents to increase forgiveness and reduce hostility towards Jewish society (Shechtman, Wade & Khoury, 2009). Compared to a control group engaging in social issues discussions, the REACH participants reported significant gains in empathy and forgiveness towards Jewish Israelis, and reductions in hostility and endorsement of violence at post-treatment and three-month follow-up (Shechtman et al., 2009).

The psychoeducational emphasis of the REACH program has made it suitable for adaptation to self-help formats for individual use. Two recent studies have explored the effectiveness of six-hour, self-directed REACH workbooks, demonstrating promising results. Harper and colleagues (2014) found that undergraduate students (n = 21) who completed the REACH workbooks were significantly more forgiving and less unforgiving than waitlist controls (n = 20); effect sizes for forgiveness measures ranged from .45 - .69 (Cohen's d) and treatment gains were maintained at two-week follow-up by the treatment group and replicated in the waitlist group after they had completed the workbooks. Comparisons to seven published randomised controlled studies of the group REACH program suggested that standardised forgiveness change scores were nearly twice as large as benchmark change scores (Harper et al., 2014). In a study evaluating the effectiveness of the Christian version of the REACH self-directed workbook, Greer and colleagues (2014) achieved similar results with a sample of 52 university students who volunteered for a study on within-congregation offences. The results of these self-

directed workbook studies provide encouraging evidence that forgiveness interventions may be effective in low-cost, self-paced, and accessible formats. Hence the current research seeks to investigate self-directed approaches further by adapting the secular REACH workbook for interactive, online administration in an Australian community sample.

Interventions Based on Other Forgiveness Models

Whilst the Enright and Worthington models have received considerable research attention, other researchers have developed distinct approaches to forgiveness interventions. These include a cognitive behavioural model of forgiveness, emotion-focused therapy, and decision-based models of forgiveness.

The Stanford Forgiveness Project. A six-week group intervention based upon a cognitive-behavioural forgiveness model (Luskin, 2001) combined psychoeducation, cognitive restructuring and emotional focusing techniques, with the explicit goal of assisting participants to change their grievance narrative, regarded as maintaining their distress, to a more acceptable and less upsetting form (Harris et al., 2006). In the Stanford Forgiveness Project, 259 adults who had experienced a heterogeneous array of problematic transgressions were recruited from the community and randomly allocated to forgiveness training or a no-treatment control group (Harris et al., 2006). Compared to the control group, participants in the treatment group showed significantly greater reductions in unforgiveness, stress and anger; improvements which were maintained at four-month follow-up (Harris et al., 2006). A notable aspect of the cognitive approach is that, in contrast to process models of forgiveness intervention, participants are not explicitly encouraged to empathise with an offender (Harris et al., 2006). This may reflect the emphasis on individual psychological wellbeing in the cognitive model of forgiveness (Luskin, 2001) compared to process models which are more interpersonally oriented (Enright, 2001; Worthington, 2001).

Emotion-focused therapy. In another study emphasising processing of transgression-related emotions, emotion-focused therapy for couples (Johnson & Greenberg, 1988) was investigated as a forgiveness promoting intervention for 20 couples in which one or both partners had been unable to overcome an emotional injury of at least two years duration (Greenberg, Warwar, & Malcolm, 2010). The treatment, comprising 10-12 weekly hour-long couple therapy sessions, also aimed to facilitate the development of mutual empathy between partners and supported an apologising process. Following treatment, the injured party in 11 couples identified as completely forgiving their partner, whilst six had made significant progress towards forgiveness compared to only three having made progress during the waitlist period. Forgiveness treatment gains were also maintained at three-month follow-up (Greenberg et al., 2010). Earlier, these authors had found that individuals receiving 12 hours of emotion-focused therapy experienced significantly more improvement in forgiveness compared to clients receiving 12 hours of group psychoeducation addressing forgiveness and recovery from an emotional injury (Greenberg, Warwar, & Malcolm, 2008).

Decision-based models of forgiveness. Finally, decision-based models of forgiveness are based on the premise that an active choice to let go of the resentment and anger of unforgiveness is a common cognitive precursor to the emotional and behavioural changes associated with emotional forgiveness (Worthington & DiBlasio, 1990; Worthington, Jennings, & DiBlasio, 2010). Most aspects of brief decision-based forgiveness interventions, including psychoeducation, disclosing the emotions suffered as a result of the transgression, and committing to forgiveness, are also included in the longer process-based models (Enright, 2001; Worthington, 2001). However, a 3-hour decision-based couple treatment was associated with larger changes in pre- to post session forgiveness than a problem focused treatment or no-treatment control (DiBlasio & Benda, 2008), demonstrating some support for the utility of brief forgiveness interventions, perhaps as first-line treatments for those wishing to reconcile with the person who hurt them.

Meta-Analytic Studies of Forgiveness Interventions

Five meta-analyses have investigated the efficacy of forgiveness interventions, each confirming that forgiveness interventions are effective at assisting people to resolve interpersonal hurts (Akhtar & Barlow, 2016; Baskin & Enright, 2004; Lundahl, Taylor, Stevenson, & Roberts, 2008; Wade, Worthington, & Meyer, 2005; Wade, Hoyt, Kidwell, & Worthington, 2014). In this section the aims and methodologies of each meta-analysis will be broadly described, followed by a summary of their findings in relation to the following questions of relevance to the present study: 1) Are forgiveness interventions useful at alleviating unforgiveness?, 2) Can forgiveness interventions also affect psychological wellbeing?, 3) What factors, if any, moderate the outcome of forgiveness interventions?, 4) Which are the effective components of interventions?, and 5) Which of the forgiveness intervention models and modes of delivery is most effective?

Baskin and Enright (2004) examined the relative effectiveness of forgiveness interventions on forgiveness and other emotional health constructs, reviewing nine empirical studies (*N* = 330 participants) which included a control group and had been published in a refereed journal. Wade and colleagues (2005) focused on forgiveness interventions in group formats, aiming to determine their efficacy in promoting forgiveness, identify components shared by interventions, and to evaluate efficacy as a function of the amount of time spent on common components in the interventions. Twenty-seven published and unpublished empirical studies were included. Effect sizes were calculated using outcome data from 39 forgiveness intervention groups, 10 alternate treatments and 16 no-treatment control groups. Lundahl and colleagues (2008) investigated the effectiveness of process-based forgiveness interventions on forgiveness and emotions in fourteen studies that included a comparison group and were published in peer-reviewed journals. More recently, Wade and colleagues (2014) assessed the

efficacy of forgiveness interventions in promoting forgiveness and mental health outcomes (depression, anxiety, hope) and examined potential moderators of treatment effects. Their random effects meta-analysis included 53 post-treatment effect sizes (N = 2,323) and 41 follow-up effect sizes (N = 1,716) derived from 54 published and unpublished research reports. Finally, Akhtar and Barlow (2016) conducted a systematic review and meta-analysis of psychological outcomes in 12 studies comparing process-based forgiveness interventions to non-treatment controls.

Forgiveness outcomes. Each of these meta-analyses affirmed the efficacy of explicit forgiveness treatments at promoting forgiveness in people who had suffered a specific interpersonal transgression (Akhtar & Barlow, 2016; Baskin & Enright, 2004; Lundahl et al., 2008; Wade et al., 2005; Wade et al., 2014). Most comprehensively, the meta-analysis of Wade and colleagues (2014) found that people receiving explicit forgiveness interventions reported substantially greater increases in forgiveness than those who received no treatment (Becker's Δ, standardised mean difference controlling for pre-test scores = 0.56) and those who received comparison or alternative treatments (Δ = 0.45). For the 18 studies which included follow-up analyses ranging from two weeks to nine months, effect sizes comparing change from baseline to follow-up (Δ = 0.45) suggested that treatment gains were maintained post-intervention (Wade et al., 2014). These findings suggest that forgiveness interventions may be more effective than other psychotherapeutic interventions at reducing unforgiveness (Wade et al., 2014).

Psychological wellbeing outcomes. Four meta-analyses addressed the effect of forgiveness interventions on psychological wellbeing outcomes. Baskin and Enright (2004) calculated mean effect sizes for emotional health outcomes (aggregating dependent variables such as self-esteem, anxiety, depression, hope, anger and empathy), finding medium to large effects for process-based group interventions (unbiased population effect size *d* = 0.59) and individual interventions (*d* = 1.42), but not decision-based interventions (*d* = .16) compared to non-treatment controls. Similarly, Lundahl and colleagues' (2008) review of process-based

interventions found medium to large effect sizes for increased positive affect (Hedge's *g* = .81) and self-esteem (*g* = .60) and decreased negative affect (*g* = .54) compared to control or alternative treatment groups.

Wade and colleagues (2014) noted that relatively few studies examined mental health outcomes in addition to forgiveness; however, the meta-analyses showed that forgiveness interventions can also result in reductions in depression (*k* = 10 studies; *Δ+* = 0.34) and anxiety (*k* = 7; *Δ+* = 0.63) and increases in hope (*k* = 6; *Δ+* = 1.00) compared to no treatment conditions. Akhtar and Barlow (2016) calculated standardised mean differences (SMD) between forgiveness interventions and no treatment control groups, finding significantly better outcomes for the interventions in positive affect (*k* = 6 studies, SMD = -0.29), depression (*k* = 6, SMD = -0.37), anger and hostility (*k* = 6, SMD = -0.49), and stress and distress (*k* = 2, SMD = -0.66), with effect sizes ranging from small to large. Their meta-analysis showed non-significant results for anxiety outcomes; however, the authors noted that, of the three studies included, two studies with considerably smaller sample sizes showed large effects for reduced anxiety (Akhtar & Barlow, 2016). Taken together, these results suggest that a general forgiveness intervention can also have benefits for psychological wellbeing.

Whilst effect sizes for improvements in depression and anxiety were 43% and 50% lower than effects for forgiveness in the same groups of studies (Wade et al., 2014), these results offer further support to the theorised association between forgiveness and psychological wellbeing, and highlight the importance of evaluating the impact of forgiveness interventions on other psychological variables. These might include forgiveness-related variables, such as empathy for the offender and rumination about the offence, and measures of stress, which is theorised to be strongly associated with unforgiveness (Strelan & Covic, 2006; Worthington, 2006).

Moderating factors. Meta-analyses focused on potential moderators of intervention effectiveness related to participants, to the offense, and to the interventions themselves.

Lundahl and colleagues (2008) categorised studies by participant and intervention characteristics and examined the group effect sizes for forgiveness outcomes. Age and student status of participants did not significantly influence results, whereas those entering treatment with elevated levels of distress appeared to benefit more than people who were less distressed at baseline (Lundahl et al., 2008). Severity of the offense was shown to be a marginally significant predictor of effect size in comparison with alternative treatment conditions (regression slope *B* = 0.045) when treatment duration was also included in the prediction model (Wade et al., 2014). This finding indicates that for more severe offences, the advantage of forgiveness treatments over alternative treatments increases. Together with the Lundahl and colleagues finding regarding distress, it suggests that people working on more severe offences may make greater gains in forgiveness, possibly because they experienced more hurt and had more unforgiveness to resolve.

Treatment duration is a widely recognised moderator of psychotherapeutic treatment outcome (Howard, Kopta, Krause, & Orlinsky, 1986) and identifying the influence of time has been a key focus of meta-analyses of forgiveness interventions. Both overall duration of forgiveness interventions and the number of discrete sessions have been positively associated with outcome. However, after removing outliers with very long durations, Lundahl and colleagues (2008) found that only the number of sessions was significantly associated with treatment effect sizes. In multiple moderator analyses, hours of treatment (regression slope *B* = 0.03) and modality (group versus individual treatment; *B* = -0.57) uniquely predicted effect sizes in forgiveness treatment versus non-treatment comparisons (Wade et al., 2014). This suggests that the dose-response effect is much stronger for individual forgiveness interventions than for group interventions: for example, the model predicts that a moderate effect size would be achieved by 5 hours of individual treatment or 10 hours of group treatment (Wade et al., 2014).

Effective components. In order to understand the relative value of time spent on different components of interventions, Wade and colleagues (2005) identified components

common to most interventions and estimated the amount of time spent on each component in each intervention. Bivariate correlations indicated that time on each component was significantly related to effect size for forgiveness (Wade et al., 2005). However, when alternative and no-treatment groups were excluded (as the absent components were coded as zero) the only components significantly related to effect size were empathy (*r* = .51), committing to forgiveness (*r* = .52) and overcoming unforgiveness (*r* = .44) (Wade et al., 2005).

Forgiveness model and modes of delivery. Each meta-analysis has attempted to identify which of the forgiveness models and modes of delivery (i.e., individual or group) are most effective at promoting forgiveness and reducing unforgiveness. Baskin and Enright (2004) found that interventions based on process models of forgiveness achieved higher effect sizes than the much briefer and cognitively based decision-based interventions, and that individual process interventions were superior to group process interventions. However, both these comparisons are likely to be confounded by duration, as the individual treatments included in the study were considerably longer (12 – 52 sessions) than group studies and decision-based studies (1 – 8 sessions; Baskin & Enright, 2004). Wade and colleagues (2004) contributed the finding that theoretically-based group interventions explicitly focusing on promoting forgiveness (standardised mean gain effect size = .57) were more helpful than alternative treatments (.26), and that full theory-based interventions (.77) were associated with larger effect sizes than partial, dismantled or early versions (.28). The advantage of explicit forgiveness interventions compared to alternative treatments was confirmed by Wade and colleagues (2014).

Moderator analyses conducted by Lundahl and colleagues (2008) showed that individually delivered programs were associated with better forgiveness outcomes than group interventions. They also found that interventions based on the Enright process model were more effective at promoting forgiveness than those based on the REACH model, with this difference persisting even when more clinically distressed samples were removed from analyses (Lundahl et al., 2008). However, despite noting that longer duration and individual mode of delivery also

showed greater effects, and that the REACH studies tended to be shorter and were all group based, these likely confounding factors were not controlled for in the analyses. Wade and colleagues (2014), subsequently addressed this issue. They showed that the Enright model was associated with higher effect sizes than interventions based on other theoretical models. However, multiple moderator analyses of treatment versus either non-treatment or alternative treatment comparisons demonstrated that intervention models did not differ in effectiveness when duration of treatment and modality (group versus individual) were controlled for (Wade et al., 2014). Treatment modality was a significant predictor of effect size in treatment versus non-treatment comparisons, suggesting that individual treatments for forgiveness may be more effective than group treatments even after controlling for duration (Wade et al., 2014).

In combination, these meta-analytic studies strongly support intervening to promote forgiveness with people who are disposed to work on reducing unforgiveness of a specific transgression as an effective way to increase forgiveness and relieve the suffering and other costs associated with prolonged unforgiveness. Larger effect sizes in forgiveness are associated with participation in theoretically-based interventions explicitly promoting forgiveness, longer treatment duration (Wade et al., 2014), and the inclusion of components promoting empathy, overcoming unforgiveness, and committing to forgiveness (Wade et al., 2005). Specific intervention models (e.g., the Enright or Worthington approaches) do not differentially predict outcome; however, individual treatment may be more effective than group interventions (Wade et al., 2014). Following the most recent study, Wade and his colleagues (2014) recommend that future research into the efficacy of forgiveness interventions includes further investigation of the active ingredients of forgiveness programs and analysis of personal and situational determinants of treatment efficacy, that is, who might benefit the most from specific forgiveness interventions.

Summary and Future Directions of Forgiveness Intervention Research

Key observations about forgiveness. In summary, the tendency to be forgiving of interpersonal offences is associated with a broad range of social, psychological, and physiological wellbeing factors; associations which are substantially attributed to the reduction of prolonged unforgiveness (Harris & Thoresen, 2005; Worthington & Scherer, 2004). Most theoretical models emphasise mature or emotional forgiveness as a process which occurs in stages over time (Enright, 2001; Luskin, 2001; Worthington, 2001) although others argue that making a decision to forgive is often sufficient to resolve unforgiveness (DiBlasio & Benda, 2008). Many factors appear to influence specific acts of forgiveness (Fehr et al., 2010), with those proximal to the transgression, such as attributions about the offender's intent, and empathy for the offender, most strongly associated with state forgiveness. However, more distal predictors such as personality traits and relationship factors are also significantly associated with the likelihood of forgiving (Fehr et al., 2010; Riek & Mania, 2012). Forgiveness interventions based on theoretical models of forgiveness are effective in increasing forgiveness and relieving the suffering and other costs associated with prolonged unforgiveness (Baskin & Enright, 2004; Wade et al., 2005).

Future directions of forgiveness intervention research. Research into forgiveness interventions has answered basic questions about the utility of explicit forgiveness interventions, but many remain unanswered (Wade et al., 2014). A key question is whether some individuals benefit more from forgiveness interventions than others; therefore, research identifying the dispositional characteristics and social-cognitive factors proximal to the offence that moderate the effectiveness of programs is a priority. Further research investigating the mechanisms underlying effective forgiveness programs is also needed; this understanding will contribute to further refinements of the programs and improve understanding of forgiveness processes. Additionally, studies which examine the potential for interventions to help participants

generalise forgiveness processes to other transgressions are also needed (Hill, Allemand, & Heffernan, 2013).

Forgiveness interventions in self-directed formats. A significant gap in the forgiveness intervention literature concerns the development and trial of self-directed or online interventions to promote forgiveness. Most research has examined individual forgiveness therapy or group programs, with both modes relying on the availability of specialist therapists familiar with forgiveness theory and the relevant intervention model. Recent exploration of self-administered workbook based interventions (Greer et al., 2014; Harper et al., 2014) suggests that the benefits of forgiveness might be experienced more widely with the development of evidence-based interventions in low-cost, accessible, self-paced formats. As will be detailed further in the next chapter, both traditional self-help and online interventions have been found effective for a range of mental health problems (Barak, Hen, Boniel-Nissim, & Shapira, 2008; Gould & Clum, 1993; Griffiths, Farrer, & Christensen, 2010). Online delivery of health interventions can facilitate the inclusion of interactive formats and multimedia components which are associated with better outcomes (Mains & Scogin, 2003). Online delivery may be particularly useful in research as the format may facilitate objective measurement of key variables of interest. For example, within-program behaviours such as the number of words typed and amount of time spent on modules could be construed as measures of treatment adherence and duration, and investigated as potential moderators of treatment effects.

Forgiveness interventions and psychological wellbeing. The evidence reviewed suggests that forgiveness interventions can provide additional benefits such as improving mental health and subjective wellbeing (Akhtar & Barlow, 2016; Wade et al., 2014). Forgiveness is associated with attenuated psychological and physiological stress responses (Griffin et al., 2015; Larkin et al., 2015). However, few studies have evaluated subjective stress levels as outcomes of forgiveness interventions (Akhtar & Barlow, 2016). Inclusion of a measure of subjective stress in forgiveness intervention studies may contribute to an understanding of the role of stress in

forgiveness processes. In addition, further research into the mechanisms associated with the transition from unforgiveness to forgiveness, as well as individual differences in how people resolve unforgiveness, is required to increase understanding of the relationship between forgiveness and health.

The role of empathy in forgiving. Despite the inclusion of empathy as a core component in process models of forgiveness (Enright & Fitzgibbons, 2000; Worthington, 2001), there is still much to learn about the role of empathic processes in forgiveness interventions, and the relationship of empathy with situational and relationship factors. At the most distal level, trait empathy is correlated with both dispositional forgivingness and forgiveness of a specific offence (Riek & Mania, 2012). Affective empathy for the offender has also been observed as a proximal predictor of state forgiveness (Fehr et al., 2010). A limitation of the research to date is that few, if any, studies have investigated whether dispositional empathy influences participation in forgiveness interventions, or whether dispositional or offence specific empathy moderates intervention effectiveness. Furthermore, forgiveness intervention studies have emphasised state affective empathy, with few studies including measures of cognitive empathy. An understanding of the extent to which victims have considered the situational constraints and motivations of the offender may provide further evidence of the role of empathy in forgiveness processes.

Given that the idea of empathising with an offender may be unpalatable for many people, gaining a deeper understanding of empathy as a mechanism in forgiveness interventions may assist the development of approaches with broader appeal. The empathy components of the REACH program attempt to facilitate a cognitive effort to understand the offender's perspective, with the aim of promoting affective empathy for the offender and emotional forgiveness (Worthington, 2001; Worthington et al., 2012). Whilst research has established the importance of empathy components in interventions (Wade et al., 2014), further research is needed to understand the role of empathy and other social-cognitive factors proximal to the transgression as mechanisms underlying the effectiveness of forgiveness interventions.

The Present Research

In response to the priorities identified above, three empirical studies were conducted in this research to investigate the outcomes of an online, self-directed adaptation of the established, evidence-based forgiveness intervention: REACH for Forgiveness. The first study examined outcomes in individuals who had completed the online REACH program at post intervention, compared to a waitlist control, and at three-month follow-up. The second study investigated whether individual differences in personality and forgiveness-related traits, situation specific social-cognitive factors, and early program behaviours predicted persistence in completing REACH modules. The third study explored pre-program and within-program factors moderating forgiveness outcomes in REACH completers, and examined empathy, humility and social-cognitive factors as possible mechanisms of change underlying the effectiveness of online REACH at promoting forgiveness. Stress and rumination were also examined as associated outcomes of forgiveness effects.

Study 1: The Effects of an Online REACH for Forgiveness Program on Forgiveness and Psychological Wellbeing

Overview of Study 1

The previous chapter highlighted the importance of developing accessible, low-cost intervention programs that can assist participants in overcoming unforgiveness following a hurtful interpersonal transgression. Psychological interventions explicitly promoting forgiveness have been shown to be effective in increasing forgiveness and improving psychological wellbeing (Wade et al., 2014). The Worthington group's REACH program (2001) has shown similar efficacy to alternative forgiveness interventions after controlling for duration and intervention mode (Wade et al., 2014) and is available in both group and individual self-help formats (Worthington, 2006; Worthington et al., 2012). Specifically, group based REACH interventions have been associated with moderate to large improvements in forgiveness in ten published studies with randomised controlled designs using non-clinical samples (see previous chapter). In addition, recent studies of REACH in individual, self-directed workbook format have also shown significant improvements in forgiveness, with standardised change scores at least as substantial as those found in benchmarked group REACH studies (Greer et al., 2014; Harper et al., 2014).

Although self-help forgiveness interventions are available in trade paperback formats, they are based on models which have been tested in group therapy studies with trained facilitators (Luskin, 2001; Worthington, 2001) or in individual psychotherapy (Enright, 2001). Until recently, with the publication of the self-directed workbook studies described earlier, no published research studies had evaluated the effectiveness of self-help interventions for forgiveness. The development of appropriately targeted, evidence based, self-directed interventions for psychological problems represent important alternatives to the dominant model of therapist based individual care which is inaccessible to many due to cost, concentration

of services in urban areas, and cultural disparities between trained professionals and populations (Kazdin & Rabbit, 2013). Self-help interventions are effective for a range of mental health problems (Gould & Clum, 1993), and are recommended initial treatments where problems are causing moderate distress and access to specialist practitioners is limited (Lovell, Richards, & Bower, 2003). The staged structure of process approaches to forgiveness may be well-suited to self-administered programs which allow participants to reflect on tasks for as long as needed and to work through interventions at their own pace. As an intervention which is primarily psychoeducational, REACH may be particularly suited for self-administration.

Similarly, information and interventions for mental health available on the internet are valued by consumers and providers for their low cost, 24-hour availability, anonymity, and ease of access from remote areas or without need for expenditure on transportation and child care (Ybarra & Eaton, 2005). Internet-based psychotherapeutic interventions have been shown to be effective in meta-analytic studies (Barak et al., 2008; Griffiths et al., 2010). Although the self-directed workbooks utilised in recent REACH studies were in digital format and submitted by email (Greer et al., 2014; Harper et al., 2014), these formats lack the distinct benefits of interactive online interventions which may include sound and video elements, multiple access points, and individualised interactive elements. At the time of writing, no controlled studies evaluating the effectiveness of an online, interactive forgiveness intervention have been published. Therefore, this study aims to replicate findings regarding general efficacy of the REACH model, and the efficacy of recent self-directed REACH interventions in particular, and test an online adaptation of the self-directed REACH workbook (Worthington et al., 2012). Although gains in forgiveness are sustained at follow-up in most studies (Wade et al., 2014), follow-up periods in the self-directed REACH studies have been brief (one or two weeks); therefore a three-month follow-up period for course completers was used in this study.

One limitation of previous forgiveness intervention research is the limited investigation of the effects of such interventions upon psychological wellbeing. For example, a recent meta-

analysis found that fewer than 20% of studies included psychological wellbeing measures as outcomes (Wade et al., 2014). Previous studies have shown reduced psychiatric symptoms following REACH interventions (Goldman & Wade, 2012; Sandage et al., 2015; Wade & Meyer, 2009), and interventions based on the Enright model (Freedman & Enright, 1996; W. F. Lin et al., 2004); although in other studies effects on psychological wellbeing have not been significant (Allemand et al., 2013; Sandage & Worthington, 2010). Psychological stress is hypothesised to be a key response to interpersonal transgression and unforgiveness (Strelan & Covic, 2006; Worthington, 2006); however, relatively few studies have measured subjective stress in the context of forgiveness interventions. Researchers in the Stanford Forgiveness Project (Harris et al., 2006) found that forgiveness treatment participants had significantly lower subjective stress levels than controls at post-test (d = 0.66) and four-month follow-up (d = 0.31). In another study, an alternative stress reduction treatment, which did not address forgiveness or the transgression, promoted forgiveness to the same degree as comparison forgiveness groups (Wade et al., 2009), further implicating the role of stress in forgiveness processes. Accordingly, measures of emotional (emotional empathy) and cognitive (rumination) wellbeing associated with the transgression, in addition to more generalised measures of psychosocial functioning (depressive symptoms, anxiety, and subjective stress levels) were included in the present research in order to further develop understanding of the association between forgiveness and psychological wellbeing.

A further limitation of the forgiveness intervention research is that few studies have sought to obtain evidence regarding the suggestion that trait forgivingness might be acquired or improved as a result of participating in a forgiveness promoting program (Hill et al., 2013). Evidence suggests that forgiveness interventions can promote dispositional changes, including reductions in trait anger (Harris et al., 2006; Lee & Enright, 2014) and attachment anxiety (Sandage et al., 2015) which have both been associated with forgiveness (Hill et al., 2015; Fehr et al., 2010; Sandage et al., 2015). Harris and colleagues (2006) also found that forgiveness group

intervention participants reported greater increases in forgiveness likelihood, that is, the likelihood they would forgive various hypothetical hurts, compared to a no-treatment control. One early REACH based study within a program to develop Christian character measured trait forgiveness at baseline and post-test, finding no significant changes (Lampton et al., 2005). In a self-directed REACH workbook study (Greer et al., 2014), trait forgiveness changed over time for both treatment and non-treatment control participants, suggesting that reports of trait forgiveness may change over time, but not in relation to the intervention. However, Sandage and colleagues' (2015) double pre-test study of REACH integrated into a group DBT protocol for people with Borderline Personality Disorder found significant pre-post increases in trait forgiveness, maintained at six-week follow-up. Again, no control group was used in that study; however, treatment gains were significant compared to gains made during a previous module. REACH components which provide general psychoeducation regarding forgiveness and encourage generalisation of the forgiveness skills taught in the program may be particularly suited to promoting forgiveness beyond the target transgression and offender addressed in the program; the present research included trait forgiveness measures at pre-intervention and follow-up for the purpose of evaluating the utility of REACH in promoting trait forgivingness.

Forgiveness intervention research has mainly been conducted in the United States, although REACH has been successfully adapted for studies in Israel (Shechtman et al., 2009) and Switzerland (Allemand et al., 2013), and comparisons between university students of foreign and US extraction found no differences in post-REACH forgiveness scores (Y. Lin et al., 2014). The Enright group has also tested forgiveness interventions in Hong Kong (Hui & Chau, 2009) and Taiwan (W. N. Lin et al., 2013). However, forgiveness research in other English speaking but culturally distinct countries such as Australia, Canada, the United Kingdom and New Zealand has been substantially limited to cross-sectional research. Hence, this study provided an opportunity to make minor adaptations to the language of the REACH self-help workbook for relevance to

Australian participants, and to investigate the effectiveness of the REACH model of forgiveness intervention with an Australian resident sample.

Aims and Hypotheses

The primary aim of Study 1 was to examine the effects of an online, self-help version of the REACH for Forgiveness program on state forgiveness, unforgiveness, state empathy and psychological wellbeing. Measures of state forgiveness (i.e., forgiveness of an offender in relation to a specific transgression) included an overall state forgiveness measure as well as both emotional and decisional forgiveness, whilst unforgiveness was operationalised as revenge motivation, avoidance motivation and rumination about the offence. Based on previous findings of the effectiveness of REACH in both group and self-help workbook formats, it was hypothesised (H1.1) that participants who completed the online REACH intervention (immediate treatment group; IT) would report greater increases in state forgiveness and empathy, and greater reductions in unforgiveness, at post-test than participants who did not complete REACH (delayed treatment group; DT). Psychological wellbeing was operationalised as depressive symptoms (depression), anxiety and stress. Given the broad association of forgiveness with mental health, in addition to meta-analytic findings that forgiveness promoting interventions could also improve psychological wellbeing, it was hypothesised (H1.2) that participants who completed REACH would report greater increases in psychological wellbeing at post-test than participants who had not completed the intervention.

A secondary aim was to evaluate the maintenance of the effects of the online REACH intervention over a longitudinal period. To maximise the available sample for analysis, this part of the study examined the effects at three-month follow-up for all participants who completed REACH (i.e., all IT participants and DT participants who completed REACH). Based upon previous evidence supporting the maintenance of the effects of REACH at follow-up, it was expected that

treatment gains would be maintained for three months after post-test. Therefore, it was hypothesised (H1.3) that scores in state forgiveness and empathy would be higher, and unforgiveness scores lower, at post-course (Time 2) and three-month follow-up (Time 3) than at baseline (Time 1) and that there would be no significant differences between scores at Time 2 and Time 3. Similarly, it was predicted (H1.4) that scores in psychological wellbeing would be higher at Time 2 and Time 3 than at Time 1; and there would be no significant difference between psychological wellbeing at Time 2 and Time 3.

Finally, as participants were recruited on the basis of wanting to learn to be more forgiving, changes in trait forgiveness and empathy from baseline to follow-up were also examined. Although the focus of the REACH intervention is on overcoming unforgiveness and attaining forgiveness towards an individual offender in relation to a specific transgression, the exercises also contain psychoeducation and skills practice elements which encourage the generalisation of forgiving cognitions and behaviours. Hence it was hypothesised (H1.5) that scores in trait forgiveness and trait empathy would be higher at Time 3 than at Time 1.

Method

Participants

Initially, 130 adults (122 female, 8 male) aged from 18 to 75 years (*M* = 48.04 years, *SD* = 13.98) responded to advertisements for a three-part online forgiveness study between 1 August 2014 to 21 May 2015, completed preliminary measures at Time 1, and consented to continue to the experimental component of the study. There were 79 participants allocated to the experimental condition and 51 participants in the waiting-list control condition. Participants were mainly Australian residents (94.6%). Most participants identified their ethnicity as either Anglo-Australian (75.4%) or European (14.6%). A range of religions and educational levels were represented, with 66.2% identifying a specific religious affiliation and 86.9% of people completing post-school education. See Table 2 for further details of participant demographics.

Recruitment activities aimed to gain a community sample of adults who wanted to learn to be more forgiving or to forgive a specific transgression. Participants were recruited via advertisement, electronic social media, and social snowball method to ensure representation of a range of age groups, values, and life experiences. Advertisements were placed on university, church, and community noticeboards including virtual noticeboards (see Appendix A for a sample recruitment flyer). Organisations including University of the Third Age Online (U3A) and Breast Cancer Network Australia (BCNA) distributed information to potential participants via their website (U3A) or by email to their research participation interest group (BCNA). Participants indicated one or more sources of information about the current study: 66.9% of participants stated that they heard about the study via personal email, 16.1% via BCNA, 10% via Facebook, 6.9% by word of mouth, and 3.8% saw an advertisement on their university noticeboard. Participants were required to be aged over 18, able to read and write in English and use a computer, have access to the internet, and be prepared to respond to questions about an interpersonal transgression for which they had not completely forgiven the offending person.

Table 2

Summary of Participant Demographic Information

Demographic variable		*N* (%)
Gender	Female	122 (93.8%)
	Male	8 (6.2%)
Age	Mean (*SD*)	48.04 (13.98)
Country of residence	Australia	123 (94.6%)
	United States	2 (1.6%)
	Other	5 (3.8%)
Ethnicity	Anglo-Australian	98 (75.4%)
	European	19 (14.6%)
	South-East Asian	4 (3.1%)
	Aboriginal or Torres Strait Islander	1 (0.8%)
	Other	8 (6.2%)
Highest completed education	Unfinished high school	8 (6.2%)
	Year 12	9 (6.9%)
	TAFE certificate	7 (5.4%)
	TAFE diploma	14 (10.8%)
	Unfinished university degree	12 (9.2%)
	Undergraduate degree	36 (27.7%)
	Postgraduate degree	43 (33.1%)
	Other	1 (0.8%)
Religious affiliation	None	44 (33.8%)
	Protestant Christian	29 (22.3%)
	Catholic	29 (22.3%)
	Other Christian	14 (10.8%)
	Jewish	1 (0.8%)
	Buddhist	7 (5.4%)
	Hindu	2 (1.5%)
	Other	4 (3.1%)
	Mean religiosity (*SD*)[a]	2.08 (1.09)

Note. *N* = 130.

[a] Religiosity scale ranged from 1 = *not at all religious* to 5 = *extremely religious*.

Materials

The following self-report measures were completed online in the order presented below. Demographic, trait measures, and details of a transgression situation were taken at Time 1 only. Outcome measures of state forgiveness and psychological wellbeing were completed at Time 1, 2 and 3. Measures of forgiveness understanding (manipulation check) and REACH program evaluation were completed at Time 2 only. Questionnaires used for all studies at Time 1 are shown in Appendix B; those added at Time 2 are shown in Appendix C. Except where indicated, measures selected are commonly used in forgiveness research.

Demographic information. Demographic items comprised age, gender, highest level of education completed, country of residence, ethnicity, religiosity and religious affiliation.

Trait forgiveness. The 10-item Trait Forgivingness Scale (TFS) (Berry, Worthington, O'Connor, Parrott, & Wade, 2005) was used to assess the 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*). Potential scores range from 10 to 50, with higher scores indicating higher self-rated forgivingness. Construct validity of the TFS has been established with strong correlations with other forgiveness measures and self- and other-ratings (Berry et al., 2005). Scale developers found internal reliability of the TFS ranged from .74 to .80, and an eight-week test-retest reliability estimate of r (60) = .78 (Berry et al., 2005). In the present study Cronbach's α = .80.

Trait empathy. The Interpersonal Reactivity Index (IRI) (Davis, 1980) is a widely used, multidimensional measure of trait empathy (Gerdes, Segal, & Lietz, 2010). Two subscales were used: *Perspective taking* (e.g., "I believe there are two sides to every question and try to look at them both") which measures the tendency to spontaneously adopt the psychological viewpoint of others, and *empathic concern* (e.g., "I often have tender, concerned feelings for people less

fortunate than me") which assesses affective responses such as compassion and sympathy for others. Each subscale comprises seven statements rated by participants from 1 (*does not describe me well*) to 5 (*describes me very well)* (Davis, 1980), with mean item scores used as subscale scores, and higher scores indicating higher levels of empathy.

Perspective taking has demonstrated acceptable internal consistency (α = .75 - .78) and test-retest reliability over 60 – 75 days (Davis, 1980). Empathic concern has demonstrated internal reliability of .68 - .73, and acceptable test-retest reliability over the same period (Davis, 1980). Two additional subscales of the IRI, fantasy and personal distress, were not used in this study as items have been found to tap self-oriented rather than other-oriented phenomena (Davis, 1983; Hodgson & Wertheim, 2007) and were deemed less relevant to the current study. Construct validity of the perspective taking and empathic concern subscales has been demonstrated by high correlations with established measures of cognitive and emotional empathy (Davis, 1983). In the present study, Cronbach's alpha for perspective taking (.78) and empathic concern (.74) and mean inter-item correlations of .36 and .29 respectively were acceptable for 7-item scales.

Personality. A 20-item short form of the International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006) was used to assess personality according to the Big Five traits of extraversion, agreeableness, conscientiousness, neuroticism, and openness (McCrae & Costa, 2003). Participants rated the accuracy of statements such as "I get chores done right away" or "I am not interested in abstract ideas" in relation to how they generally see themselves on a 5-point Likert-type scale from 1 (*very inaccurate*) to 5 (*very accurate*). Subscale means (after reverse coding some items) were computed to give trait scores.

Although brief, the Mini-IPIP was developed and evaluated across five independent samples, and was shown to have acceptable internal consistency (alphas ranging from .65 for intellect/imagination to .77 for extraversion) and high test-retest correlations over intervals of

three weeks (*r* = .62 - .87) and nine months (*r* = .68 - .86) (Donnellan et al., 2006). The Mini-IPIP has been shown to have similar patterns of convergent, discriminant and criterion validity as other Big Five measures of personality (Donnellan et al., 2006). An independent evaluation of the Mini-IPIP showed acceptable reliability and a five-factor exploratory factor analysis model showed acceptable model fit with negligible cross-loading of items across the factors, with the authors concluding that the Mini-IPIP was a suitable short-form measure of the five factor model of personality (Cooper, Smillie, & Corr, 2010). In the present study, Cronbach's alphas (with mean inter-item correlations in brackets) for the five personality traits were acceptable for four-item scales: Extraversion, .80 (.50); Agreeableness, .66 (.33); Conscientiousness, .65 (.32); Neuroticism, .75 (.43); Openness, .80 (.50).

Psychological wellbeing. The 21-item short form Depression Anxiety Stress Scales (DASS-21)(P. F. Lovibond & Lovibond, 1995; S. H. Lovibond & Lovibond, 1995) was used to measure the extent of current psychological distress, with each of three subscales comprising seven items: *Depression* (e.g., "I felt down-hearted and blue"), *anxiety* ("I experienced breathing difficulty"), and *stress* ("I found it hard to wind down"). Participants rated the extent to which each statement applied to them in the previous week on a scale from 0 (*did not apply to me at all*) to 3 (*applied to me very much of the time*). Subscale scores were summed, with higher scores indicating more frequent symptoms (S. H. Lovibond & Lovibond, 1995).

Convergent and discriminant validity of the DASS has been supported by comparisons with other measures of anxiety and depression (Antony, Bieling, Cox, Enns, & Swinson, 1998; Brown, Chorpita, Korotitsch & Barlow, 1997). A study of 439 Canadian psychiatric outpatients used confirmatory factor analyses to test the relationship of the DASS with the tripartite model of anxiety and depression in a clinical sample (Clara, Cox & Enns, 2001). In the tripartite model, depression is uniquely characterised by low affect and anhedonia, anxiety is uniquely associated with physiological hyperarousal, and a third nonspecific factor of general distress (measured by the stress subscale in the DASS) is related to both conditions (Clark & Watson, 1991). A

confirmatory factor analysis of the DASS using a large UK-based non-clinical sample (*N* = 1,771) supported a three factor model of the latent structure (Crawford & Henry, 2003).

Internal consistency reliability in a large non-clinical sample has been shown to be acceptable for the depression, anxiety, and stress scales (α = .91, .84 and .90, respectively)(P. F. Lovibond & Lovibond, 1995); with similar values found in clinical samples (Antony et al., 1998) and in worried older adults (Gloster et al., 2008). In the current study, Cronbach's alphas for stress (.89), anxiety (.82) and depression (.91) were good for 7-item scales.

Transgression situation. Participants were asked to describe an event where someone they knew said or did something which offended or hurt them, or treated them unfairly, for which they had not completely forgiven the offender and were still feeling resentful, hurt or angry. Participants indicated the type of relationship they had with the offender (e.g., partner, employer) and the amount of time elapsed since the transgression occurred, and rated the severity of the offence and how close the relationship was prior to the transgression on scales from 1 (*not at all*) to 10 (*extremely*).

State forgiveness. Several measures assessed participants' self-rated forgiveness of the person who hurt them. A single item asked participants to rate the extent of current forgiveness for the offender from 1 (*not at all*) to 10 (*completely*). Another single item, *willingness to forgive*, measured the extent to which they would like to forgive the person if they could on a scale from 1 (*no desire to forgive*) to 10 (*wish I could forgive*).

Emotional and decisional forgiveness. The Emotional Forgiveness Scale (EFS) and Decisional Forgiveness Scale (DFS) were developed to aid research into forgiveness processes (Worthington, Hook, Utsey, Williams & Neil, 2007). Each 8-item scale measures a distinct form of forgiveness: the DFS assesses behavioural intention to behave less negatively and more positively towards an offender, whilst the EFS assesses the degree to which respondents have begun to replace negative other-oriented emotions with positive ones (Worthington, Hook, et

al., 2007). Sample items from the DFS include "If I see him/her I will act friendly" and "I will not talk with him/her" (reversed item) and the EFS includes "I care about him/her" and "I'm bitter about what he/she did to me" (reversed). Participants rated their agreement with item statements on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) with some items reverse scored. Scale totals were calculated, with higher scores indicating greater levels of decisional or emotional forgiveness.

Construct validity for the DFS and EFS has been supported by correlations with established measures of state forgiveness and forgiveness-related constructs. Internal reliability coefficients for the DFS (α = .80, .82) and EFS (α = .76, .69) were deemed acceptable (Worthington, Hook, et al., 2007) and three-week test-retest reliability coefficients were *r* = .73 for both DFS and EFS. In later studies, Cronbach's alpha for the DFS have ranged from .77 to .86 and for the EFS from .69 to .86 (Dorn, Hook, Davis, Van Tongeren & Worthington, 2014; Hook, Worthington, Utsey, Davis & Burnette, 2012; Sandage et al., 2015). Cronbach's alpha coefficients in the current study for decisional forgiveness (.78) and emotional forgiveness (.72), and mean inter-item correlations of .34 and .23 were acceptable for 8-item scales.

Overall state forgiveness. The Rye Forgiveness Scale (RFS; Rye et al., 2001) measures forgiveness towards a specific offender. Participants indicated their agreement with 15 statements (e.g., "I feel resentful toward the person who wronged me") on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Subscale and scale totals were calculated (after reversing negatively worded items), with higher scores indicating greater levels of forgiveness.

In the original study sample (Rye et al., 2001) of *N* = 287, internal consistency reliability (α = .87) and test-retest reliability over an average of 15 days (.80) was acceptable. Construct validity of the RFS has been established by positive correlations with other forgiveness measures and with related constructs (Rye et al., 2001). In the current study Cronbach's alpha for the RFS (.83) was acceptable.

State unforgiveness. Two subscales of the Transgression Related Interpersonal Motivations Inventory (TRIM) (McCullough & Hoyt, 2002; McCullough et al., 1998) were used to measure unforgiving motivations towards a particular offender. The 5-item *revenge* subscale measured motivation to seek revenge upon an offender (example item: "I want to see him hurt and miserable") whereas the 7-item *avoidance* subscale described motivation to avoid the offender ("I keep as much distance between us as possible"). Participants rate their agreement with items on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Mean subscale and total scores were calculated, with higher scores indicating greater revenge or avoidance motivations. A third subscale, measuring benevolence towards an offender, was not used due to its high negative correlation with the avoidance subscale (McCullough & Hoyt, 2002).

Construct validity of the TRIM has been supported by correlations with a variety of relationship-specific and offense-specific variables (McCullough et al., 1998). High internal reliability has been reported for each of the TRIM subscales, with Cronbach's alphas across various samples ranging from .83 to .94 for the avoidance subscale and .83 to .94 for revenge (McCullough & Hoyt, 2002; McCullough et al., 1998)). In the current study, Cronbach's alphas for Revenge (.88) and Avoidance (.90) were acceptable.

State empathy. Batson's Empathy Scale (BES) (Coke, Batson, & McDavis, 1978) measured current affective empathy for the offender. Participants rated empathy related adjectives for the extent that they describe feelings for the offender from 1 (*not at all*) to 6 (*extremely*). Higher mean scores indicate that the respondent experiences more empathy for the identified other. Factor analyses have found the eight adjectives to load on two factors of empathic concern (softhearted, empathic, warm, concerned and compassionate) and personal distress (upset, alarmed and troubled) (Coke et al., 1978). Only the five empathic concern items were used in this study, as personal distress has been shown to impact forgiveness in a different way to other oriented aspects of empathy (Davis, 1983; Hodgson & Wertheim, 2007). Subsequent studies have varied the number of items in this frequently used scale (Batson &

Shaw, 1991; Eisenberg & Miller, 1987); however, a 6-item version of the scale (sympathetic, moved, compassionate, warm, soft-hearted, tender) has demonstrated internal consistency reliability of α = .82 and adequate construct validity via moderate positive correlations with IRI subscales Perspective taking (*r* = .27) and Empathic concern (.37) (Batson, Bolen, Cross, & Neuringer-Benefiel, 1986). Cronbach's alpha for the 5-item scale used in this study (.93) was excellent.

Rumination. The Rumination about an Interpersonal Offense Scale (RIOS; Wade, Vogel, Liao, & Goldman, 2008) assesses rumination in relation to a specific offender and transgression. Participants rated the extent of their agreement with six statements ("I can't stop thinking about how I was wronged by this person") from 1 (*strongly disagree*) to 5 (*strongly agree*) and item scores were totalled to give a scale score. Higher scores indicated more rumination.

Exploratory and confirmatory analyses have supported a one-dimensional structure for the RIOS, with high estimates of internal consistency (Cronbach's α > .90) (Wade et al., 2008). Convergent and discriminant validity has been supported by correlations in appropriate directions with constructs including revenge, avoidance, forgiveness and anger (Wade et al., 2008). In the current study Cronbach's α = .91, which is high for a 6-item scale.

Treatment fidelity and manipulation checks. The number of hours participants spent logged into REACH modules was calculated by extracting start and finish times from the Qualtrics system. Similarly, the number of words typed by participants whilst completing the modules was also calculated by downloading participant response sets, downloaded into word documents and extracting word counts. These measures were used as indicators of the extent to which participants had used the learning materials as intended.

Forgiveness understanding. Seven items were developed to ascertain the effectiveness of the REACH course in inducing understanding of forgiveness processes and definitions. These items were only administered at Time 2 and were utilised as manipulation checks. As such, it was

expected that those in the treatment condition would score higher after completing the REACH course than waiting list participants who had not yet completed the course.

Statements representing various definitions of forgiveness were adapted directly from Module 1 of the REACH course. Participants indicated the extent of their agreement about whether statements such as "excusing the person from punishment" were true of forgiveness on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Six items were reverse scored. Mean total scores were calculated, with higher scores indicating closer agreement with the definitions of forgiveness taught in the REACH course. In the current study at Time 2 (*n*=62), Cronbach's α = .71, which is adequate for a 7 item scale, and mean inter-item correlations was .25.

Online REACH evaluation. A five-item evaluation questionnaire was previously used to assess the degree to which participants thought that the REACH workshop was valuable and beneficial for them (Wade et al., 2009). In this earlier study, Cronbach's alpha = .76, and corrected item-total correlations ranged from .44 to .70 (Wade et al., 2009). For the current study, these items were adapted and expanded (to seven items) to evaluate participants' overall experience of the self-help, online version of REACH. Sample items included, "I liked the fact that the REACH course was available online" and "I would recommend the REACH course to others". Participants indicated the extent of their agreement with seven statements on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) and were optionally invited to recommend improvements or make any other comments. Mean scores were calculated, with higher scores indicating greater overall satisfaction with the experience of completing the REACH program. Reliability estimates for the REACH evaluation scale completed by participants in both conditions who completed the course (*n*= 36) were satisfactory, Cronbach's *α* = .89, mean inter-item correlations = .51.

Participant equipment. In order to gain additional information about their online experience, participants who had completed the REACH course (*n* = 36) also responded to

questions identifying the type (computer, laptop, tablet, phone) and platform (Mac, PC, Apple, Android, Windows) of device used to complete study questionnaires and REACH course modules.

Other measures used in later studies. In addition to the measures described above, other measures were included which are described in later studies. These include estimates of time spent working on the modules, actual time logged onto modules, number or words typed by participants during modules, and social-cognitive factors related to state forgiveness.

Online REACH Intervention

For this study, the REACH self-help workbook (Worthington, Lavelock, & Scherer, 2012), was adapted for online delivery (online REACH) in collaboration with the first author of the REACH method. REACH comprises six components: defining and exploring beliefs about forgiveness, recalling the hurt (R), building empathy for the offender (E), promoting an altruistic (A) response to the offender based upon participants' own experiences of being forgiven, making a commitment (C) to forgiving the offender, and developing strategies to hold on (H) to forgiveness. An outline of the activities included in online REACH is shown in Appendix D.

Online REACH was accessed through a study-specific website[1], *Learning Forgiveness*, which served as a home page for participants undertaking the REACH course. The website was developed by the researchers on Weebly, a commercial web-hosting service. The website was primarily designed to host links to each module and facilitate easy contact with the researchers, but also provided access to support and supplementary materials. Separate pages provided background information about forgiveness research and the development of the REACH model,

[1] The study website is not open access, but has been made available for examiners to review at www.learningforgiveness.net . Links to REACH modules can also be reviewed.

provided tips for online participation, and access to all course materials including links to videos and information sheets summarising aspects of the REACH model.

Online REACH comprised a six-module structure parallel to that of the self-help workbook and group versions of REACH. The six online modules were developed using Qualtrics Survey Software; Qualtrics was selected in preference to available online education packages due to its facility to easily capture and analyse participant responses at each stage of the course. Each module was designed to be completed in one sitting; however, participants were able to take a break without losing their work for up to 24 hours. The online delivery method allowed for integration of audio-visual elements such as links to externally hosted videos and audio-recordings of instructions for experiential exercises. Interactive elements of the program included the use of click-and-drag visual rating scales, customised display of questions or course elements (including some optional additional episodes), and retrieval of selected earlier participant responses for review at the end of the module. Downloadable certificates and handouts were also made available within modules and via the Learning Forgiveness website. In addition, participants could opt in to receive email transcripts of their written exercises at the end of each module.

The pre-treatment survey and online REACH course was tested in a pilot trial in April 2014. Reviewers included a psychology honours student, a clinical psychology doctoral candidate (paid as a research assistant) and three other interested people (social network of the investigators). In addition, the original author of the REACH forgiveness method, Dr Everett Worthington, Jr., reviewed the pre-treatment survey and course materials. All reviewers offered positive appraisals of the project materials and made constructive suggestions for improvement. Feedback concerned minor changes to language and concerns regarding accessibility and functionality of the course materials on different devices. All suggested improvements were integrated prior to the main study being launched.

Design

The study utilised a randomised controlled trial design to assess post-course outcomes, comparing an immediate treatment group (IT) with a delayed treatment control (DT), see Figure 2, using the method of previous REACH workbook studies (Greer et al., 2014; Harper et al., 2014). Participants were allocated to one of the two groups randomly; however, participants were paired (with the DT participant receiving the Time 2 survey when their paired IT participant had completed the course or after a similar time period had elapsed) to ensure that time elapsed between pre-treatment and post-treatment comparison analyses was similar in each group. Once control participants completed their Time 2 questionnaire, they were given access to the intervention program to complete. Follow-up analyses did not use a control group as participants who completed the REACH course from both IT and DT conditions were combined.

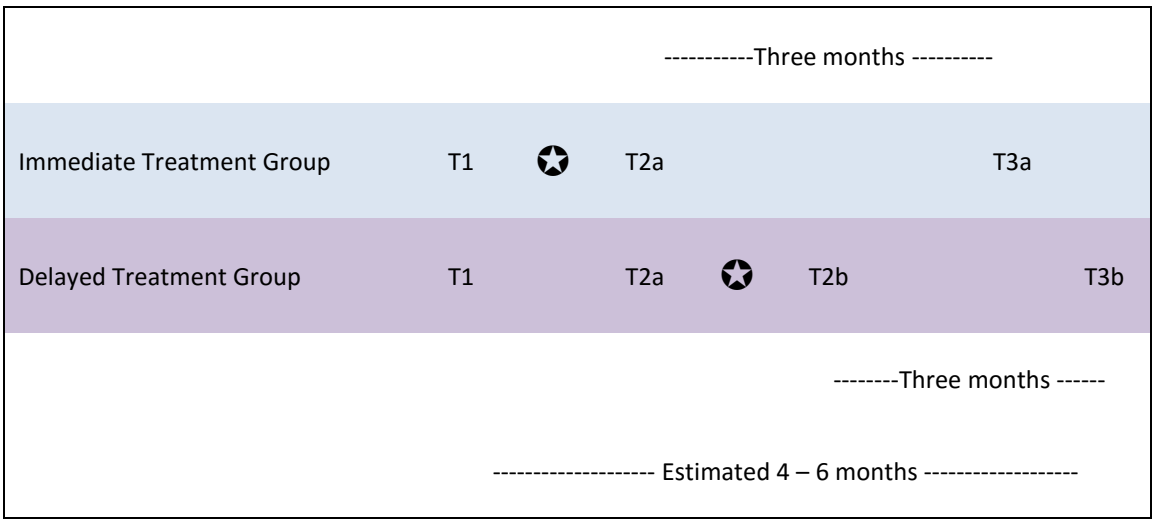

Figure 2. Schematic diagram of the research design. ✪ = REACH Intervention; T1 = Pre-treatment; T2a = Post-treatment comparison (REACH completed by IT group); T2b = Post-treatment (DT group only); T3 = Follow-up (three months after completion of REACH).

Procedure

This study was approved by La Trobe University Human Ethics Committee. Participants were invited into a study called the Learning Forgiveness Project, which was delivered online via hyperlink to the Qualtrics website. Recruitment methods are described in the Participants section (page 59). Participants were advised that they could withdraw from the study at any stage by ceasing their involvement. Information provided to prospective participants is shown in Appendix E.

Participants interested in the study accessed a direct link to a Qualtrics survey, indicating informed consent by agreeing that they had read the participant information and selecting "I consent". Next, participants constructed a unique identification code which was entered at each phase of the study and facilitated matching of participant data. For pre-treatment (Time 1) measures, participants completed demographic items and measures of trait forgiveness, trait empathy, personality, and psychological wellbeing. Next, they described a transgression situation and completed measures of state forgiveness, state empathy, and transgression related rumination. Detailed suggestions were made to participants regarding the optimal choice for a transgression to work on throughout the experimental phase of the study to allow participants to develop forgiveness skills without experiencing excessive distress. Specifically, it was recommended that participants chose a relatively isolated or distinct incident of moderate hurtfulness or offensiveness. Using logic in the Qualtrics program, participants were encouraged to select another transgression if their responses to selected state forgiveness measures indicated they had already substantially forgiven their transgressor (a score of 8 or more out of 10 on a single item rating extent of current forgiveness, or if the participant endorsed "agree" or "strongly agree" on item 2 of the EFS, "I no longer feel upset when I think of him/her").

At the end of the Time 1 survey, participants were asked whether they wished to proceed to Part 2 of the research study, which involved completing online REACH. After giving

their consent, participants who chose to proceed were randomly allocated to immediate treatment (IT) or delayed treatment (DT) conditions. The randomisation was performed as a function within the online survey (hosted by Qualtrics Survey Software) to ensure unbiased allocation to conditions. Initially, the block randomisation method, or even distribution between groups, was used to maintain a similar sample size in each condition. Given the higher dropout rate observed in the IT condition, the proportion of cases allocated to the IT condition was later increased to ensure a viable sample for analysis.

The IT group were invited to begin online REACH immediately, and were given the link to the website, whilst the DT group were advised of a delay of up to four weeks. Each DT participant was paired with an IT participant for the purpose of minimising variation in the delay before completing outcome measures. The online REACH intervention was completed by participants at their own pace in multiple sessions estimated to take up to six hours over a recommended period of two weeks. All REACH modules were available simultaneously, and clear directions were provided regarding accessing modules in sequence, estimated times for completion, and module themes and contents. Each of the six REACH modules was stand-alone, hosted by Qualtrics. It was recommended to participants that they complete each module in one session and they had the option of receiving the full text of the module and their responses by email (automated function). Direct support from researchers was limited to responding by email or telephone to specific participant enquiries. Email reminders were sent to participants who had not accessed the program for seven days encouraging them to persist with the study and providing a link directly to the next module they were scheduled to attempt. Participants could opt out of online REACH, and the study, at any time by ceasing program-related activity.

At completion of the final REACH module by the IT group, participants were directed by hyperlink (and follow-up automated email) to post-course measures (Time 2a). The questionnaire included the outcome measures of state forgiveness, state empathy, psychological wellbeing, and forgiveness understanding (manipulation check). A link for completing those

outcome measures was emailed individually to DT group participants when the IT participant with whom they were paired completed the program. On completing that questionnaire (Time 2a), the DT group members were invited to begin online REACH, after which they completed the outcome measures a second time (Time 2b).

For all participants who completed online REACH (i.e., all participants in the IT group and those in the DT group who continued to the program), REACH program evaluation and participant experience (time taken and equipment used) items were included with the outcome measures after online REACH had been completed. Of all course completers, 21 participants (58.3%) reported using a laptop computer, 14 (38.9%) used a desktop computer, 2 used an iPad or tablet (5.5%) and 1 used a smartphone (iPhone; 2.8%) to complete REACH modules. Of computer users, 28 (80%) reported using PC based systems and 7 (20%) used Mac based systems.

Participants were invited by email with a Qualtrics survey link to complete follow-up measures three months after finishing the REACH program (Time 3a and b). Follow-up measures included state forgiveness, state empathy, psychological wellbeing, trait forgiveness, and trait empathy.

Participants had the option of claiming a $15 AUD reward voucher upon completion of the post-treatment and follow-up surveys (i.e., completion of Part 2 or 3 of the study). In total, IT group participants could claim a maximum of $30 for completing all components of the study, whereas DT participants, who completed post-treatment measures as comparisons and also following completion of the course, could claim a total of $45 for completing all components.

Data Analysis

Attrition analyses. Differences between Time 2 completers and non-completers on demographic, trait, situation and outcome variables were assessed using independent samples *t*-tests and chi-square tests for independence. Participants included in analyses were all those who consented to participate in Part 2 of the study and were randomised to IT or DT conditions. For all chi-square tests, Yates Continuity Correction values are presented, unless cell frequencies fell below 10, in which case significance value was derived from Fisher's Exact Probability test (Pallant, 2011).

Baseline analyses. Differences on demographic, trait, situation and outcome variables between conditions (IT vs. DT) at Time 1 for all those participants who completed Time 2 measures were assessed using independent *t*-tests and chi-square tests for independence. A conservative critical value of .10 was used to determine significance for these analyses to minimise the possibility of group differences confounding treatment effects in the main analyses.

Correlations. To check for violations of the assumption of singularity, bivariate correlations (Pearson's product moment correlation) among state forgiveness variables and psychological wellbeing variables were calculated at Time 1 and Time 2 for both conditions. To identify potential covariates for the main analyses, bivariate correlations were also calculated between those variables which differed between IT and DT conditions (age, severity, willingness to forgive, time since transgression, trait forgiveness and perspective taking) and psychological wellbeing and forgiveness-related outcome variables.

Treatment fidelity and manipulation checks. Mean scores for time spent and words typed whilst logged into the REACH modules were calculated to evaluate the extent to which participants experienced the treatment as intended. Proximal learning outcomes of the REACH

course were assessed by independent-samples *t*-tests comparing mean group responses for forgiveness understanding at Time 2.

Post-course outcomes (H1.1 – 1.2). Post-course outcomes analyses were conducted for all participants who completed Time 2 measures. Outcome variables for the main analyses were grouped as follows: 1) overall state forgiveness; 2) transgression-specific responses (emotional forgiveness, decisional forgiveness, avoidance, revenge and rumination); 3) state empathy; and, 4) psychological wellbeing (depression, stress). Anxiety was not included in analyses due to data being severely skewed and having a high correlation with stress (r = .78).

Mixed between-within subjects ANCOVA analyses were conducted to examine the interaction effect (condition X time) and main effects of condition (IT vs. DT) and time (Time 1, Time 2) on single outcome measures (state forgiveness and empathy). Covariates were severity, willingness to forgive, perspective taking and trait forgiveness measured at baseline. The interaction effects were the effects of primary interest. For significant interactions, post-hoc one-way ANCOVA analyses examined differences between IT and DT conditions on the dependent variable of interest at Time 2. For these analyses, Time 2 scores on the relevant outcome variable was the dependent variable, condition (IT vs. DT) was the independent variable, and covariates included Time 1 scores and other covariates as listed above.

Mixed within-between MANCOVA analyses were performed to further assess the effect of online REACH on transgression-specific responses and on psychological wellbeing when the IT group was compared to the control group (DT) who had not yet completed the course. In each MANCOVA, the within-subjects factor was time, and the between-subjects factor was condition (IT, DT). For transgression-specific responses, covariates included in the model were severity, willingness, perspective taking and trait forgiveness; for psychological wellbeing, covariates were trait forgiveness and perspective taking only. Levene's test indicated that the assumption of equality of error variances was violated for revenge (T1 and T2) and rumination (T1), therefore a

more conservative significance level (.01) was planned for these variables in univariate *F* tests. As above, post-hoc one-way ANCOVA analyses were conducted for variables showing significant univariate interactions.

In relation to all post-course outcomes, parallel analyses were conducted with covariates excluded (mixed ANOVA and MANOVA) to examine results for consistency between analyses with and without covariates. Interaction effects for these analyses are also reported in the Results section. Although the high attrition rate (51.5%) indicated intention-to-treat analyses (ITT) may not provide meaningful information (Little et al., 2012), main post-course outcome analyses were repeated using the last observation carried forward (LOCF) method, in which T2 scores were set at T1 levels for participants who did not complete T2 measures. Covariates were included in ITT analyses as described above.

Follow-up analyses (H1.3 – 1.5). To evaluate maintenance of REACH program effects at 3-month follow-up, analyses were conducted on the combined sample of participants who completed the program (i.e., IT and DT groups combined). Therefore, Time 2 refers to data collected at immediate post-treatment for all participants. To evaluate any systematic differences between participants originally allocated to immediate treatment and delayed treatment conditions, standardised residual change scores were first calculated for all outcome variables at Time 1-2, Time 1-3 and Time 2-3 and then the two groups were compared using independent *t*-tests. Because there were no significant differences the groups were combined.

Time 3 completer analyses. For all participants who completed Time 3 measures (T3 completers), repeated-measures ANOVAs were conducted to examine the effect of time (Time 1, Time 2, Time 3) on all outcome measures. For the purpose of reducing the chance of Type 1 error given multiple comparisons, family-wise Bonferroni adjustments were calculated, setting a significance level of $p < .007$ for the group of forgiveness-related variables and $p < .025$ for psychological wellbeing variables. Pairwise comparisons, also using Bonferroni adjustments ($p <$

.01), compared scores at each pair of time points. To assess the effect of the REACH course on trait variables (trait forgiveness, empathic concern and perspective taking), paired samples *t*-tests compared scores for all participants at Time 1 and Time 3.

Intention-to-treat analyses. The above analyses were repeated for all participants who completed the REACH program. A conservative approach to follow-up analyses was taken in which it was assumed that if someone did not complete T3 (follow-up) measures they had regressed to T1 levels of forgiveness and other outcome measures. Thus, those who did not complete T3 measures had their T1 data recorded at T3.

Overall. Effects sizes were calculated using eta squared (η^2) or partial eta squared (η_p^2) to demonstrate the association between the independent variable and dependent variable. Cohen's (1988) effect size conventions were used to assess the strength of association, with effect sizes of .01, .06, and .14 demonstrating small, moderate and large effect sizes, respectively. In addition, effect sizes for main post-outcome and follow-up analyses were converted to Cohen's *d* for ease of use by future researchers. These are included in Tables 8-12 and 14-17 in the Results section, with effect sizes of .2, .5, and .8 indicating small, moderate and large effects respectively (Cohen, 1988). Significance values are set at $p = .05$ unless stated otherwise, and all *p* values are two tailed.

Results

Preliminary Analyses

Data were prepared for analysis following guidelines by Tabachnick and Fidell (2013). All measures were checked for accuracy of data entry and missing values prior to analysis. In order to preserve cases, missing item values (fewer than 5% of the full participant data set and randomly spread) were addressed by casewise substitution of the relevant mean subscale value.

Univariate outliers were detected by inspecting boxplots and histograms. Outliers with *z* scores in excess of +/-3.29 were identified for empathic concern (2 cases), revenge (1 case), and time since transgression (2 cases); these scores were adjusted to equal one unit lower (or higher) than the next lowest (or highest) score (Tabachnick &Fidell, 2013). For the combined sample in follow-up analyses, outliers with *z* scores in excess of +/-3.29 were identified for revenge (1 case) at Time 1 and Time 2; these scores were adjusted to equal one unit higher than the next highest score (Tabachnick &Fidell, 2013), whilst also preserving the direction of change for that individual.

Normality of continuous variables used in analyses was assessed by inspecting histograms and calculating standardised values for skewness and kurtosis indices. Skewness and kurtosis indices for most scales fell within *z* = +/- 3.29, indicating that assumptions of normality were not violated. Proposed outcome variables with non-normal distributions included anxiety and depression which demonstrated severe positive skew (i.e., a higher frequency of low scores) as might be expected in a non-clinical community sample, and revenge motivation, which showed moderate positive skew. Of potential covariates or predictor variables, time since the reported transgression demonstrated moderate positive skew, whilst ratings of relationship closeness and transgression severity demonstrated moderate negative skew; these variables were also skewed in the direction that would be expected for people who have volunteered to participate in a forgiveness study and the type of transgression they were asked to identify. Logarithmic (depression) or square root (revenge, severity, time since transgression, closeness)

transformations of these variables were used in analyses except where noted (Tabachnick & Fidell, 2013). In follow-up analyses, revenge and depression again demonstrated severe and moderate positive skew respectively (i.e., a higher frequency of low scores) as might be expected in a non-clinical community sample of volunteers in a forgiveness study and the type of transgression they were asked to identify. Logarithmic 10 (revenge) and square root (depression) transformations were used in analyses (Tabachnick & Fidell, 2013).

Linearity was established by inspection of scatterplots. Homogeneity of variance was checked for all parametric tests using Levene's test for equality of variance; where violations are noted ($p < .05$), values reported are for equal variances not assumed.

Sample Characteristics

Figure 3 summarises the participant flow for this study with reasons, if known, for attrition or exclusion at each stage. Overall, 254 people responded to the invitation to participate by following the link to the online survey and 184 completed preliminary measures at Time 1. Participants were given the choice to continue with the experimental (non-anonymous) phase of the study, and 130 consented to proceed and completed the randomiser step. Of those randomised to immediate and delayed treatment conditions, 63 completed measures at Time 2a (48% retention), with the remaining 67 excluded from analysis for various reasons as shown.

For follow-up analyses, the 23 immediate treatment participants who completed the REACH intervention were combined with 13 delayed treatment participants who subsequently completed the REACH program, giving a "completers" sample of $n = 36$. Of these, 32 completed three-month follow-up measures at Time 3 (89% retention). Data at Time 3 for one participant was incomplete.

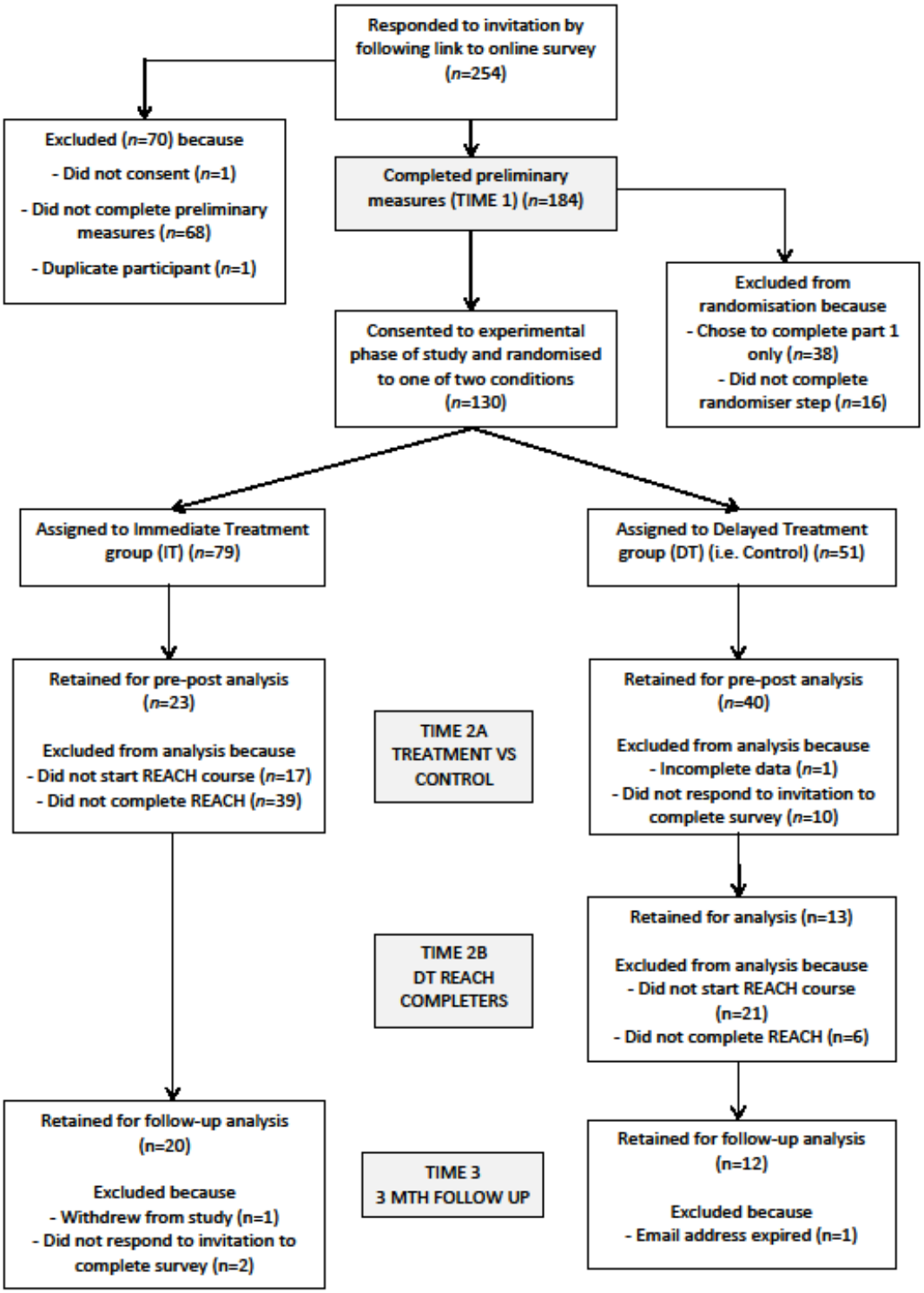

Figure 3. Participant flow diagram for Study 1

Categorisation of offences. In the current study, participants described transgressions perpetrated primarily by family members (36.2%) and friends (20.0%), as well as current (10.0%) or former (13.1%) partners or spouses, colleagues or co-workers (7.7%), bosses or supervisors (6.2%) and health professionals (2.3%). The amount of time elapsed since the transgression ranged from 1 day to 68 years, with a mean time elapsed of 6.26 years (*SD* = 9.44 years), or a median time elapsed of two years (25th percentile = five months and 75th percentile = 7.25 years). That is, a quarter of participants described transgressions occurring less than five months prior to the study, 25% identified transgressions occurring between five months and two years prior to the study, 25% between two and 7.25 years, and 25% identified transgressions occurring more than 7.25 years prior to beginning the study.

The nature of transgressions described by participants was rated according to guidelines developed by Leary, Springer, Negel, Ansell and Evans (1998). Transgression situations were classified into one of seven categories: (a) active disassociation (explicit rejection, ostracism, or abandonment); (b) passive disassociation (being ignored, not being included in others' activities, and other instances of implicit rejection); (c) criticism (including verbal abuse); (d) betrayal (including infidelity, betraying confidences and behavior outside role expectations); (e) teasing; (f) feeling unappreciated, used, or taken for granted; and (g) other or unclassifiable (including examples of insensitivity and disagreements). Frequencies in each category are given in Table 3. In the sample of participants who completed post-course outcomes (*n* = 63), 41.3% of participants described situations in which they were actively or passively rejected or abandoned, 25.4% reported betrayal, and 17.5% reported criticism or verbal abuse.

Table 3

Categories of Hurtful Transgressions Described by Participants

Transgression category	Completers, *N* = 63 Frequency (%)	Follow-up, *N* = 36 Frequency (%)
Active dissociation	10 (15.9%)	3 (8.3%)
Passive dissociation	16 (25.4%)	13 (36.1%)
Criticism	11 (17.5%)	6 (16.7%)
Betrayal	16 (25.4%)	9 (25.0%)
Teasing	0 (0%)	0 (0%)
Under appreciation	5 (7.9%)	2 (5.6%)
Other / Unclassifiable	5 (7.9%)	3 (8.3%)
Total	63 (100%)	36 (100%)

Note. Transgressions categorised according to a schematic developed by Leary, Springer, Negel, Ansell and Evans (1998).

Post-Course Outcomes, Hypotheses 1.1 – 1.2

Attrition analyses. Statistics for **i**ndependent samples *t*-tests and chi-square tests for independence used to evaluate systematic attrition biases for those participants who consented to participate in part 2 are located in Appendix F. Analyses revealed no significant differences between participants who completed Time 2 measures (completers, *n* = 63) compared to those who consented to the experimental component of the study but did not complete Time 2 measures (non-completers, *n* = 67) on any demographic variables, except age for which completers (*M* = 50.98, *SD* = 13.81) were older than non-completers (*M* = 45.27, *SD* = 13.66), $t(128) = -2.37$, $p = 0.019$, mean difference = -5.71, 95% CI [-10.48, -0.94], $\eta^2 = .04$.

No significant differences were found between completers and non-completers on trait variables, $t(128) < -1.91$, $p > .059$. Analyses found no significant differences between completers and non-completers on situation variables, $p > .079$, or wellbeing measures at Time 1, $t(128) < 0.34$, $p > .737$. However, there was a significant difference between completers and non-completers in several state forgiveness measures at Time 1, including emotional forgiveness, $t(128) = -2.03$, $p = .044$, mean difference = -1.97, 95% CI [-3.88, -0.05], $\eta^2 = .03$, decisional

forgiveness, $t(128) = -3.07$, $p = .003$, mean difference = -3.09, 95% CI [-5.08, -1.10], $\eta^2 = .07$, state empathy, $t(128) = -2.16$, $p = .033$, mean difference = -0.48, 95% CI[-0.92, -0.04], $\eta^2 = .03$, and revenge motivation, $t(128) = 2.66$, $p = .009$, mean difference = 0.37, 95% CI [0.09, 0.65], $\eta^2 = .05$. These results suggest that, at Time 1, completers were already somewhat more forgiving, more empathic and less vengeful toward the people who had hurt them than people who did not complete the measures at Time 2. In contrast, on other measures of forgiveness, including willingness to forgive, avoidance motivation and overall state forgiveness, no significant differences between completers and non-completers were found, $t(128) < -1.46$, $p > .116$.

Baseline analyses examining differences between conditions at Time 1 (T1).

Independent *t*-tests and chi-square tests for independence were used to assess for any systematic differences between participants who completed Time 2 measures after being randomised to either immediate treatment (IT; $n = 23$) or delayed treatment (DT; $n = 40$) conditions. A conservative critical value of .10 was used to determine significance for these analyses to minimise the possibility of group differences confounding treatment effects in the main analyses. Table 4 shows all significant independent *t*-test results; the remainder can be found in Appendix G, along with full details of chi-square tests.

Analyses revealed that IT participants were significantly younger and more educated than DT participants. A Chi-square test for independence indicated a significant association between highest education level completed and condition, with people in the delayed condition evenly spread between categories (school, TAFE, undergraduate and postgraduate) whilst in the immediate treatment condition most participants (73.9%) had completed an undergraduate or postgraduate qualification, $\chi^2(3, 63) = 6.59$, $p = .086$, moderate effect size of Cramer's $V = .32$ (Pallant, 2011). No significant differences were observed on other demographic variables, $\chi^2(3, 63) < 1.51$, $p > .470$.

No significant differences were found between IT and DT groups on trait variables, except for trait forgiveness and perspective taking, suggesting that participants in the immediate

treatment group had a greater tendency to take the perspective of others and be forgiving of interpersonal offences than those in the control condition. Analyses indicated significant differences between IT and DT groups on situation variables including the time elapsed since the transgression and participant rating of the severity of the offence committed against them. Participants in the IT group had selected more recent transgressions than those in the DT group, whilst IT participants rated the severity as lower than those in the DT condition.

No significant differences were found between IT and DT groups on wellbeing measures at Time 1, $t(61) < 1.21$, $p > .233$. For state forgiveness and empathy measures at Time 1, significant differences were found between IT and DT groups on willingness to forgive, overall state forgiveness and on state empathy. These results indicate that IT participants were already more forgiving, more willing to work on forgiveness of their identified offender and more empathic towards their offenders than those in the DT group. No significant differences were observed between IT and DT groups for other state forgiveness measures and rumination, $t(61) < 1.42$, $p > .161$.

Correlations. Table 5 shows bivariate correlations among outcome variables. Correlations among psychological wellbeing measures and among state forgiveness and empathy measures support construct validity.

In addition, bivariate correlations among psychological wellbeing variables and among state forgiveness variables were calculated at Time 2 for the two conditions. High correlations were observed between anxiety and stress at Time 1 for the DT group ($r = .78$) and between scores at Time 2 on emotional forgiveness and overall forgiveness and between emotional forgiveness and state empathy for the IT group ($r > .80$). No other violations of the assumption of singularity were detected; therefore multivariate analyses of variance could proceed with appropriate exclusions from the forgiveness-related outcomes (overall forgiveness and state empathy were analysed separately) and psychological wellbeing outcomes (anxiety). Stress was retained in analyses in preference to anxiety, as scores on anxiety were less normally distributed than on stress.

Table 4

Significant Independent T-tests Comparing Immediate Treatment Versus Delayed Treatment Participants for Demographic and Continuous Outcome Variables

	Immediate treatment (*n*=23)		Delayed treatment (*n*=40)				95% Confidence Interval			
Variable	*M*	*SD*	*M*	*SD*	*t*(61)	*p*	Mean Difference	Lower	Upper	Effect size η^2
Age (years)	46.91	13.03	53.32	13.86	-1.81	.076	-6.41	-13.51	0.69	.05
Trait forgiveness	34.13	7.17	28.70	6.12	3.04	.003	5.43	1.86	9.00	.13
Perspective taking	4.09	0.53	3.66	0.70	2.55	.013	0.43	0.0-	0.76	.09
Time since transgression (months)[a]	49.19	73.85	104.81	117.32	-2.45	.017	-55.63	-103.84	-7.41	.09
Severity of offence[a]	7.48	1.93	8.55	1.72	2.46	.017	-1.07	-2.01	-0.13	.09
Willingness to forgive[b]	9.22	1.54	6.20	3.47	4.75	<.001	3.02	1.49	4.55	.27
State Forgiveness	50.48	8.89	45.50	10.81	1.87	.066	4.98	-0.34	10.29	.05
State empathy	3.14	1.59	2.25	1.19	2.51	.015	0.88	0.18	1.59	.09

Note. Means and standard deviations are based on mean scale scores. Levene's Test for Homogeneity of Variance was not violated in any calculations except for Willingness to forgive and Time since transgression in which cases the values given are for equal variances not assumed.

[a] Transformed variables: Means and standard deviations (and mean difference and 95%CI) are for untransformed values; *t* statistic and significance calculated on transformed values.

[b] Construct was measured by single item on a 10-point scale.

Table 5

Pearson's Correlation Matrix Showing Inter-Relationships Among Outcome Variables at Baseline (Time 1)

Variable		2	3	4	5	6	7	8	9	10
1.	Stress	.75**	.62**	-.15	-.21	-.40**	.17	.06	-.12	.41**
2.	Anxiety	-	.56**	-.06	-.12	-.29*	.11	.05	-.06	.34**
3.	Depression		-	-.14	-.25*	-.44**	.22	.08	-.20	.37**
4.	Emotional forgiveness			-	.42**	.56**	-.28*	-.40**	.59**	-.15
5.	Decisional forgiveness				-	.59**	-.63**	-.49**	-.65**	-.20
6.	State forgiveness					-	-.49**	-.43	.49**	-.68**
7.	Revenge motivation						-	.13	-.34**	.30*
8.	Avoidance motivation							-	-.58**	.17
9.	State empathy								-	-.02
10.	Rumination									-

Note. $N = 63$.

*. $p < .05$ (2-tailed). **. $p < .01$ (2-tailed).

Potential covariates. Bivariate correlations between variables which differed between IT and DT conditions and outcome variables at Time 1 are shown in Appendix H. Results show no significant correlations between outcome variables and age ($r < .24$) or time since transgression ($r < .22$). However, participant rating of the severity of the offence and willingness to forgive correlated significantly with measures of forgiveness, empathy and rumination (Pearson's *r* ranged from -.31 to .43). Trait forgiveness and perspective taking showed significant correlations with forgiveness, empathy and psychological wellbeing measures ($r = -.43 - .62$). Accordingly, severity, willingness, perspective taking and trait forgiveness were included as covariates in main analyses for forgiveness outcomes, and trait forgiveness and perspective taking included as covariates in analyses for psychological wellbeing outcomes.

Treatment fidelity and manipulation check. As described in previous self-directed forgiveness studies (Greer et al., 2014; Harper et al., 2014), data were collected to determine the fidelity with which the online intervention was undertaken by those who completed the intervention ($n = 23$). The mean time to complete the REACH modules was 6.63 ($SD = 4.96$) hours, calculated by subtracting login time from logout time for each module. This was considered adequate as the time proposed by researchers for participants to complete the program was roughly six hours. The mean number of words typed in all modules was 3,700 (SD = 1,971), with a range from 644 to 7637 words. Only one participant typed fewer than 1000 words. These results were comparable to published studies of the workbook version of REACH from which the current online intervention was adapted (Greer et al., 2014; Harper et al., 2014). No participants were excluded from analyses due to low levels of engagement, to avoid artificially inflating effect size estimates.

The proximal learning outcomes of the REACH course were assessed by independent-samples *t*-tests comparing mean group responses for forgiveness understanding at Time 2. There was a significant difference between groups, with the immediate treatment group ($M = 4.05$, SD

= 0.49) indicating greater understanding of forgiveness definitions than the delayed treatment group (*M* = 3.75, *SD* = .55), *t*(60) = 2.20, *p* = .031, with a moderate effect size (mean difference = 0.31, η^2 = .07, 95%CI [0.30, 0.59]). These mean differences are in the expected direction and indicate that the proximal effect of completing the REACH course was an increase in understanding the definitions of forgiveness promoted by the course.

REACH program evaluation. For participants completing the REACH program, mean overall satisfaction with the program was high, *M* = 4.41 (*SD* = 0.71). As shown in Table 6, the percentage of participants who agreed or strongly agreed with positive statements related to their experience of the REACH course ranged from 75.0 to 97.2%.

Table 6

Frequency (Percentage) of Participants Indicating Low or High Agreement with Online REACH Evaluation Items

		Disagree / Strongly disagree (%)	Agree / Strongly agree (%)
1	I am glad that I have completed the online REACH course	1 (2.8%)	35 (97.2%)
2	The information and skills in the REACH course have helped me with other hurts I have experienced	2 (5.6%)	33 (91.7%)
3	Completing the REACH course has had an impact on my personal relationships	3 (8.3%)	30 (83.3%)
4	I would recommend the REACH course to others	3 (8.3%)	27 (75.0%)
5	Completing the REACH course has helped me with the specific past hurt that I worked on during the course	2 (5.6%)	32 (88.9%)
6	The online modules in the REACH course were easy for me to access	2 (5.6%)	30 (83.3%)
7	I liked the fact that the REACH course was available online	2 (5.6%)	34 (94.4%)

Note. N = 36.

Main analyses for post-course outcomes. Means, standard deviations and range of scores for all outcome variables were calculated. Results are presented in Table 7.

Table 7

Means and Standard Deviations of the Immediate Treatment and Delayed Treatment Conditions at Time 1 and Time 2

	Range (Time 1)	Time 1		Time 2	
		M	*SD*	*M*	*SD*
Immediate treatment (*N* = 23)					
State forgiveness	26.00 – 71.00	50.48	8.89	61.52	7.91
Emotional forgiveness	8.00 – 32.00	22.00	6.13	29.65	7.21
Decisional forgiveness	14.00 – 40.00	32.56	5.47	34.48	4.44
Avoidance	1.00 – 4.57	3.25	0.95	2.56	1.06
Revenge[1]	1.00 – 3.40	1.18	0.22	1.09	0.20
State empathy	1.00 – 6.00	3.14	1.59	3.78	1.46
Rumination	6.00 – 28.00	16.91	5.71	12.56	5.31
Stress	7.00 – 19.00	13.04	4.77	11.91	3.75
Depression[1]	7.00 – 25.00	10.48	4.08	10.00	4.04
Delayed treatment (*N*= 40)					
State forgiveness	25.00 – 67.00	45.50	10.81	46.70	9.41
Emotional forgiveness	11.00 – 35.00	21.50	5.61	21.77	5.56
Decisional forgiveness	19.00 – 40.00	30.50	5.61	31.90	4.99
Avoidance	1.00 – 5.00	3.43	1.16	3.48	1.02
Revenge[1]	1.00 – 3.60	1.25	0.30	1.18	0.26
State empathy	1.00 – 6.00	2.25	1.19	2.34	1.15
Rumination	6.00 – 30.00	18.02	7.41	18.00	5.17
Stress	7.00 – 25.00	13.30	4.83	13.17	4.62
Depression[1]	7.00 – 27.00	11.90	5.24	11.65	5.01

[1]. Means and standard deviations are untransformed values.

***State forgiveness*.** A greater increase of forgiveness in the IT condition than in the DT condition was predicted. Forgiveness-related variables showed some high intercorrelations (r > .80) for the IT group at Time 2, therefore overall state forgiveness was assessed using analysis of covariance, with the remaining forgiveness-related variables assessed with multivariate analysis of variance.

A mixed between-within subjects ANCOVA with forgiveness as the dependent variable and severity of the offence, willingness to forgive, trait forgiveness and perspective taking (all measures taken at Time 1) included as covariates resulted in a significant time x condition interaction effect, Wilks' lambda = .57, $F(1, 57) = 43.36$, $p < .001$, $\eta_p^2 = .43$. There was a significant main effect of time, Wilks' lambda = .88, $F(1, 57) = 7.66$, $p = .008$, $\eta_p^2 = .12$, but no main effect of condition, $F(1, 57) = 1.86$, $p = .178$, $\eta_p^2 = .03$. Estimated marginal means and summary statistics are shown in Table 8.

Table 8

Estimated Marginal Means (Standard Errors) and Summary Statistics for Mixed ANCOVA Comparing Participants in IT and DT Conditions at Time 1 and Time 2 on State Forgiveness

	Immediate treatment (N = 23)		Delayed treatment (N= 40)		Wilks' lambda	Group x Time $F(1, 57)$	p	η_p^2 (d)
	Time 1	Time 2	Time 1	Time 2				
State forgiveness	45.16 (1.79)	57.96 (1.73)	48.56 (1.30)	48.75 (1.25)	.57	43.36	<.001	.43 (1.74)

Note. State forgiveness was measured using Rye Forgiveness Scale. d = Cohen's d. Covariates appearing in the model are evaluated at the following values: Willingness to forgive = 7.30, trait forgiveness = 30.68, perspective taking = 3.82, severity_sqrt = 1.60.

Post-hoc one-way ANCOVA analyses compared the effect of condition on Time 2 state forgiveness. The independent variable was condition (IT vs. DT), and the dependent variable was Time 2 state forgiveness. Participants' Time 1 state forgiveness scores, as well as other covariates as listed above, were used as covariates in the analysis. A significant condition effect,

$F(1, 56) = 41.89$, $p < .001$, $\eta_p^2 = .43$ (very large effect size), combined with inspection of means, suggested that IT participants improved more on state forgiveness than DT participants.

Transgression-specific responses. A mixed within-between MANCOVA was performed to further assess the effect of the REACH intervention on forgiveness when compared to the control condition of participants who had not yet completed the course. Covariates included in the model were willingness to forgive, severity, trait forgiveness and perspective taking as above. As shown in Table 9, there was a significant interaction of time and condition on the combined dependent variables, Wilks' lambda = .56, $F(5, 53) = 8.22$, $p < .001$, $\eta_p^2 = .44$ (large effect). Neither of the main effects for combined variables were significant, time: Wilks' lambda = .85, $F(5,53) = 1.88$, $p = .113$, $\eta_p^2 = .15$; condition: Wilks' lambda = .98, $F(5, 53) = 0.18$, $p = .969$, $\eta_p^2 = .02$. In associated ANCOVAs there were significant univariate interaction effects for emotional forgiveness, avoidance and rumination, all $p < .001$ and with large effect sizes, but not for decisional forgiveness or revenge. Univariate main effects of time ($p > .502$) and condition ($p > .856$) for decisional forgiveness and revenge were all non-significant.

Post-hoc one-way ANCOVA analyses compared the effect of condition on Time 2 transgression-related outcomes. In each analysis, the independent variable was condition (IT vs. DT), and the dependent variable was Time 2 scores on the relevant outcome variable. Participants' Time 1 scores, as well as other covariates as listed above, were used as covariates in the analysis. Significant interaction effects, as well as inspection of means indicated that IT participants reported significantly greater improvements in emotional forgiveness, $F(1,56) = 17.46$, $p < .001$, $\eta_p^2 = .24$, avoidance, $F(1,56) = 16.13$, $p < .001$, $\eta_p^2 = .22$, and rumination, $F(1,56) = 26.82$, $p < .001$, $\eta_p^2 = .32$ than DT participants. These differences all had large effect sizes.

Table 9
Estimated Marginal Means (Standard Errors) and Summary Statistics for Mixed ANCOVAs Comparing Participants in IT and DT Conditions at Time 1 and Time 2 on Transgression-Specific Responses

	Immediate treatment (*N* = 23)		Delayed treatment (*N*= 40)		Group x Time	*p*	η_p^2 (*d*)
	Time 1	Time 2	Time 1	Time 2	*F (1, 57)*		
Emotional forgiveness	19.54 (1.20)	27.39 (1.33)	22.91 (0.87)	23.07 (0.96)	23.57	<.001	.29 (1.28)
Decisional forgiveness	30.82 (1.24)	32.95 (1.05)	31.50 (0.90)	32.78 (0.76)	0.51	.478	.01 (0.20)
Avoidance	3.65 (0.23)	2.80 (0.22)	3.21 (0.16)	3.34 (0.16)	19.18	<.001	.25 (1.15)
Revenge[1]	1.23 (0.06)	1.13 (0.06)	1.22 (0.05)	1.15 (0.04)	0.18	.671	.00 (0.00)
Rumination	18.80 (1.42)	13.32 (1.19)	16.94 (1.03)	17.57 (0.86)	24.22	<.001	.30 (1.31)

Note. Overall MANCOVA, Wilks' lambda = .56, $F(5, 53) = 8.22$, $p < .001$, $\eta_p^2 = .44$. Covariates appearing in the model are evaluated at the following values: Willingness to forgive = 7.30, trait forgiveness = 30.68, perspective taking = 3.82, severity_sqrt = 1.60. *d* = Cohen's *d*.
[1]. Square root transformation.

***State empathy*.** Table 10 shows results of a mixed ANCOVA conducted to assess the effects of condition and time on state empathy with severity of the offence, willingness to forgive, trait forgiveness and perspective taking included as covariates. There was a significant interaction between condition and time, Wilks' lambda = .89, $F(1, 57) = 6.76$, $p = .012$, $\eta_p^2 = .11$. Neither of the main effects were significant, time: Wilks' lambda = .96, $F(1, 57) = 2.44$, $p = .124$, $\eta_p^2 = .04$; condition, $F(1, 57) = 1.53$, $p = .221$, $\eta_p^2 = .03$.

Table 10

Estimated Marginal Means (Standard Errors) and Summary Statistics for Mixed ANCOVA Comparing Participants in IT and DT Conditions at Time 1 and Time 2 on State Empathy

	Immediate treatment (*N* = 23)		Delayed treatment (*N*= 40)		Wilks' lambda	Group x Time *F (1, 57)*	*p*	η_p^2 (*d*)
	Time 1	Time 2	Time 1	Time 2				
State empathy	2.63 (0.29)	3.36 (0.28)	2.55 (0.21)	2.58 (0.20)	.89	6.76	.012	.11 (0.70)

Note. State empathy was measured by Batson's Empathy Adjectives. Covariates appearing in the model are evaluated at the following values: Willingness to forgive = 7.30, trait forgiveness = 30.68, perspective taking = 3.82, severity_sqrt = 1.60. *d* = Cohen's *d*.

Post-hoc one-way ANCOVA analyses compared the effect of condition on Time 2 state empathy as above. Time 1 state empathy scores, as well as other covariates as listed above, were used as covariates in the analysis. A significant condition effect, $F(1, 56) = 8.42$, $p = .005$, $\eta_p^2 = .13$ (large effect), combined with inspection of means, suggested that IT participants improved more on state empathy than DT participants.

***Psychological wellbeing*.** A mixed within-between MANCOVA comparing the IT condition and the control condition was performed to assess the effect of online REACH on psychological wellbeing, after controlling for baseline trait forgiveness and perspective taking. The MANCOVA showed a non-significant time x condition interaction effect on the combined dependent variables, Wilks' lambda = .92, $F(2, 58) = 2.57$, $p = .085$, $\eta_p^2 = .08$. There was a significant main effect of time, Wilks' lambda = .84, $F(2, 58) = 5.30$, $p = .008$, $\eta_p^2 = .15$, suggesting that overall psychological wellbeing improved for all participants from Time 1 to Time 2. There was no significant main effect of condition Wilks' lambda = .99, $F(2, 58) = .41$, $p = .666$, $\eta_p^2 = .01$.

As shown in Table 11, there was a significant univariate interaction effect for stress. Post-hoc one-way ANCOVA analyses including Time 1 stress scores, trait forgiveness and perspective taking as covariates did not reach significance, $F(1, 58) = 3.39$, $p = .071$, $\eta_p^2 = .05$.

The moderate effect size suggests that these results may be effected by low power in the small sample. In combination with inspection of means, results suggest a near significant tendency for greater improvement on stress for the IT group compared to the DT group.

Table 11
Estimated Marginal Means (Standard Errors) and Summary Statistics for Mixed ANCOVAs Comparing Participants in IT and DT Conditions at Time 1 and Time 2 on Stress and Depression

	Immediate treatment (*N* = 23)		Delayed treatment (*N*= 40)		Group x Time *F (1, 59)*	*p*	η_p^2 (*d*)
	Time 1	Time 2	Time 1	Time 2			
Stress	14.30	12.48	12.58	12.85	5.22	.026	0.08
	(0.95)	(0.94)	(0.71)	(0.70)			(0.59)
Depression[1]	1.02	1.00	1.02	1.02	0.37	.546	0.01
	(0.03)	(0.03)	(0.02)	(0.02)			(0.20)

Note. Overall MANCOVA, Wilks' lambda = .92, $F(2, 58) = 2.57$, $p = .085$, $\eta_p^2 = .08$. Stress was measured by the DASS-21 Stress subscale; depression was measured by the DASS-21 Depression subscale. Covariates appearing in the model are evaluated at the following values: Trait forgiveness = 30.68, perspective taking = 3.82. *d* = Cohen's *d*.
[1]. Log 10 transformation.

Confirmation ANOVA analyses comparing conditions over time. Parallel mixed between-within subjects ANOVA analyses were performed for all outcome variables to confirm the above results without the inclusion of covariates. Table 12 shows the interaction effects for each variable. Significance and sizes of effects are similar to results of analyses as above, with the exception of stress. When covariates were excluded, results for stress showed a non-significant interaction with small effect size in contrast to the significant interaction effect noted above.

Table 12

Summary Statistics for the Interaction Effects of Mixed ANOVAs Comparing Participants in IT and DT conditions at Time 1 and Time 2

	F (1, 61)	*p*	η_p^2	*d*
State forgiveness	33.49	< .001	.35	1.47
Emotional forgiveness	31.37	< .001	.34	1.43
Decisional forgiveness	0.27	.606	.00	0.00
Avoidance	15.66	< .001	.20	1.00
Revenge[1]	0.01	.902	.00	0.00
State empathy	5.99	.017	.09	0.63
Rumination	14.97	< .001	.20	1.00
Stress	1.27	.263	.02	0.28
Depression[2]	0.17	.682	< .01	< 0.20

Note. *d* = Cohen's *d*.

[1]. Square root transformation.

[2]. Log10 transformation

Intention-to-treat analyses comparing conditions over time. Parallel mixed between-within subjects ANCOVA and MANCOVA analyses were performed as described above for all participants randomised to IT (*N* = 79) and DT (*N* = 51) conditions. For non-completer participants, T1 scores were repeated at T2, on the assumption that those who dropped out of the study experienced no changes on outcome measures. Supporting the efficacy of the intervention, significant time x condition interaction effects were observed for emotional forgiveness, $F(1,128) = 4.23$, $p = .042$, $\eta_p^2 = .03$, avoidance, $F(1,128) = 5.47$, $p = .021$, $\eta_p^2 = .04$, and rumination, $F(1,128) = 5.13$, $p = .025$, $\eta_p^2 = .04$, and a near significant interaction for overall state forgiveness, $F(1,128) = 3.62$, $p = .059$, $\eta_p^2 = .03$. Interaction effects for the remaining outcome measures were non-significant, $F(1, 128) < 1.67$, $p > .198$, $\eta_p^2 < 0.01$.

Maintenance of Treatment Gains at Three-Month Follow-Up, Hypotheses 1.3 – 1.5

Follow-up analyses were conducted on the combined participants from both IT and DT groups who completed the REACH program and post-course outcomes at Time 2. Completer analyses (*n* = 32) include only those participants who went on to complete Time 3 measures at three months post-course, whilst in intention-to-treat analyses (ITT; n = 36), those who did not complete T3 measures had their T1 data recorded at T3.

Group differences. Standardised residual change scores were calculated for all outcome variables at Time 1-2, Time 1-3 and Time 2-3. Independent *t*-tests were used to assess for any systematic differences between participants originally allocated to immediate treatment (IT; *n* = 20) or delayed treatment (DT; *n* = 12) conditions. There was a near significant difference between groups on the standardised change in overall state forgiveness between Time 2 and Time 3, with IT participants (*M* = -0.22, *SD* = 1.15) making smaller changes than DT participants (*M* = 0.36, *SD* = 0.46), *t*(30) = -1.99, *p* = .056, 95%CI [-1.17, 0.02]. Analyses revealed no significant differences in change scores between IT participants and DT participants on any other outcome variable, *t*(30) < 1.43, *p* > .162). Accordingly, participants from the two groups were combined in subsequent analyses.

Correlations. Bivariate correlations among outcome variables of psychological wellbeing (depression, stress), state forgiveness and empathy at Time 1 were calculated (see Table 13). Correlations among psychological wellbeing measures and among state forgiveness and empathy measures support construct validity.

Table 13

Pearson's Correlation Matrix Showing Inter-Relationships Among Outcome Variables at Baseline

Variable	2	3	4	5	6	7	8	9
1. Stress	.65**	-.16	-.10	-.18	.05	.29	-.11	.42*
2. Depression	-	-.42*	-.35	-.47**	.45*	.49**	-.16	.57**
3. Emotional forgiveness		-	.77**	.93**	-.65**	-.71**	.80**	-.62**
4. Decisional forgiveness			-	.83**	-.68**	-.65**	.70**	-.56**
5. State forgiveness				-	-.80**	-.76**	.75**	-.80**
6. Revenge motivation					-	.52**	-.51**	.71**
7. Avoidance motivation						-	-.59**	.71**
8. State empathy							-	-.45*
9. Rumination								-

Note. N = 32.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

In addition, bivariate correlations among psychological wellbeing variables and among state forgiveness variables were calculated at Time 2 and Time 3. High correlations ($r > .80$) were observed between scores on overall forgiveness and emotional forgiveness (T2 and T3), emotional forgiveness and state empathy (T2 and T3), and between overall forgiveness and decisional forgiveness, revenge and rumination (T3). Given these high correlations, main analyses were conducted using ANOVAs with Bonferroni adjustment to account for family-wise error instead of MANOVAs.

Main analyses for follow-up outcomes: Time 3 completer analyses. Follow-up analyses were first conducted with the sample of participants who had completed questionnaires at all three time points.

Maintenance of effects at follow-up. A series of repeated-measures ANOVAs were conducted to examine the effect of time (Time 1, Time 2, Time 3) on all outcomes measures. Means, standard deviations and summary statistics are shown in Table 14. Analyses indicated a significant effect of time in the expected directions for overall state forgiveness, emotional

forgiveness, decisional forgiveness, avoidance, rumination, state empathy and stress, but not for depression or revenge.

Table 14
Means (Standard Deviations) and Summary Statistics for Repeated-Measures ANOVA Comparing Time 1, Time 2, and Time 3 for Completer Participants

	Time 1	Time 2	Time 3	*N*	*Wilks' lambda*	*F*	*p*	η_p^2 (*d*)
State forgiveness	49.74_a (10.82)	60.48_b (10.55)	60.03_b (10.67)	31	.32	27.60	<.001*	.66 (2.79)
Emotional forgiveness	21.12_a (6.62)	28.28_b (7.78)	28.00_b (7.35)	32	.40	22.43	<.001*	.60 (2.45)
Decisional forgiveness	*32.25_a (5.67)*	*34.97_b (4.07)*	*34.03_{ab} (4.77)*	*32*	*.66*	*7.67*	*.002**	*.34 (1.44)*
Avoidance	3.20_a (1.06)	2.50_b (1.16)	2.64_b (1.18)	31	.61	9.35	.001*	.39 (1.60)
Revenge[1]	*0.09_a (0.13)*	*0.05_a (0.12)*	*0.10_a (0.15)*	*31*	*.81*	*3.30*	*.051*	*.18 (0.94)*
Rumination	16.55_a (6.11)	12.03_b (6.16)	10.97_b (5.30)	31	.45	17.90	<.001*	.55 (2.21)
State empathy	2.75_a (1.68)	3.41_b (1.65)	3.09_{ab} (1.81)	31	.67	7.17	.003*	.33 (1.40)
Depression[2]	*3.18_a (0.53)*	*3.09_a (0.51)*	*3.03_a (0.41)*	*31*	*.90*	*1.61*	*.218*	*.10 (0.67)*
Stress	13.32_a (4.63)	11.64_b (3.74)	11.00_b (3.84)	31	.77	4.20	.025*	.22 (1.06)

Note. Means with different subscripts differ at $p < .05$ (pairwise comparisons with Bonferroni adjustment); subscript ab = the mean is not significantly different to either time point. Alpha values for *F* statistic use family-wise adjustments using Bonferroni adjustments for multiple comparisons. Alpha for forgiveness-related variables = .007, for psychological wellbeing variables = .025. Italicised measures are those which did not show significant differences from T1 to T2 when compared to a control group. Differences in sample sizes are due to one participant partially completing Time 3 measures. *d* = Cohen's *d*.
*. Result is significant after Bonferroni adjustment for multiple comparisons.
[1]. Logarithmic transformation (Log_{10})
[2]. Square root transformation

Pairwise comparisons with Bonferroni adjustment compared scores at each pair of time points. Results indicated significant ($p < .01$) differences for Time 1-2 and Time 1-3 and no differences ($p > .728$) for Time 2-3 for state forgiveness, emotional forgiveness, avoidance, rumination and stress, suggesting that post-treatment gains were maintained at follow-up for

these measures. For decisional forgiveness and state empathy, differences were significant for Time 1-2 but not for Time 1-3, indicating that treatment gains were observed at Time 2 but these were not maintained at Time 3. For depression and revenge motivation, the *t*-tests showed no significant differences for Time 1-2, Time 2-3 or Time 1-3, indicating that scores did not change substantially at post-treatment or follow-up. As previously noted, results for depression and revenge may be confounded by floor effects.

Trait variables at Time 3. Statistics for paired samples *t*-tests conducted to assess for differences in trait variables between Time 1 and Time 3 for participants who completed all measures are shown in Table 15. Trait forgiveness scores increased significantly from Time 1 (*M* = 32.13, *SD* = 7.64) to Time 3 (*M* = 36.03, *SD* = 6.65), *t*(30) = -3.88, *p* = .001, mean score difference = -3.90, 95% CI [-5.96, -1.85], $\eta^2 = 0.33$. Results indicated that increases in trait empathic concern and perspective taking were non-significant; however, the effect size for the increase in perspective taking was moderate to large.

Table 15
Means (Standard Deviations) and Summary Statistics for Paired Sample T-Tests Comparing Trait Variables from Time 1 to Time 3 for Completer Participants

	Time 1 *M (SD)*	Time 3 *M (SD)*	95% CI Lower	95% CI Upper	*t*	*p*	η^2 (*d*)
Trait forgiveness	32.13 (7.64)	36.03 (6.65)	-5.96	-1.85	-3.88	.001	0.33 (1.40)
Empathic concern	4.40 (0.51)	4.45 (0.52)	-0.20	0.11	-0.61	.544	0.01 (0.20)
Perspective taking	3.96 (0.52)	4.11 (0.65)	-0.30	0.01	-1.94	.062	0.11 (0.70)

Note. *N* = 31. *d* = Cohen's *d*.

Main analyses for follow-up outcomes: Intention-to-treat analyses. Analyses were repeated for all participants who completed the REACH program; those (*n* = 4) who did not complete T3 measures had their T1 data recorded at T3.

Maintenance at follow-up. Means, standard deviations and summary statistics are shown in Table 16. As before, analyses indicated a significant effect of time in the expected directions for overall state forgiveness, emotional forgiveness, decisional forgiveness, avoidance, rumination, state empathy and stress, but not for depression or revenge. Pairwise comparisons confirm the pattern of changes reported above, except for revenge, for which the decrease between T1 and T2 was significant (as was the subsequent increase to pre-intervention levels by follow-up) and stress, for which the decrease in scores did not reach significance until T3.

Table 16
Means (Standard Deviations) and Summary Statistics for Repeated-Measures ANOVA Comparing Time 1, Time 2, and Time 3 for Intention-to-Treat Participants

	Time 1	Time 2	Time 3	*N*[3]	*Wilks' lambda*	*F*	*p*	η_p^2 (*d*)
State forgiveness	49.66_a (10.31)	60.17_b (10.48)	58.77_b (10.77)	35	.34	32.23	< .001*	.66 (2.79)
Emotional forgiveness	21.36_a (6.34)	28.39_b (7.70)	27.47_b (7.15)	36	.40	25.38	<.001*	.60 (2.45)
Decisional forgiveness	32.36_a (5.36)	34.78_b (4.20)	33.94_{ab} (4.52)	36	.72	6.47	.004*	.28 (1.25)
Avoidance	3.28_a (1.04)	2.54_b (1.12)	2.78_b (1.19)	35	.61	10.47	<.001*	.39 (1.60)
Revenge[1]	0.10_a (0.13)	0.05_b (0.12)	0.11_a (0.15)	35	.76	5.11	.012	.24 (1.12)
Rumination	16.88_a (5.91)	12.86_b (6.54)	11.94_b (5.79)	35	.51	15.54	<.001*	.48 (1.92)
State empathy	2.78_a (1.59)	3.44_b (1.63)	3.07_{ab} (1.71)	35	.67	8.09	.001*	.33 (1.40)
Depression[2]	3.17_a (0.52)	3.10_a (0.50)	3.03_a (0.41)	35	.92	1.39	.263	.08 (0.59)
Stress	13.08_a (4.49)	11.94_a (3.79)	11.03_b (3.71)	35	.83	3.34	.048	.17 (0.91)

Note. Means with different subscripts differ at $p < .05$ (pairwise comparisons with Bonferroni adjustment); subscript ab = the mean is not significantly different to either time point. Alpha values for *F* statistic use family-wise adjustments using Bonferroni adjustments for multiple

comparisons. Alpha for forgiveness-related variables = .007, for psychological wellbeing variables = .025. *d* = Cohen's *d*.
*. Result is significant after Bonferroni adjustment for multiple comparisons.
[1]. Logarithmic transformation (Log_{10})
[2]. Square root transformation
[3]. Differences in sample sizes are due to one participant partially completing Time 3 measures.

Trait variables at Time 3. Results from paired samples *t*-tests conducted to assess for differences in trait variables between Time 1 and Time 3 for ITT participants are shown in Table 17. As before, there was a significant increase in trait forgiveness scores from Time 1 (*M* = 32.34, *SD* = 7.34) to Time 3 (*M* = 35.80, *SD* = 6.43), *t*(34) = -3.78, *p* = .001, mean score difference = -3.90, 95% CI [-5.32, -1.60], $\eta^2 = 0.29$. Results indicated that increases in trait empathic concern and perspective taking were non-significant.

Table 17
Means (Standard Deviations) and Summary Statistics for Paired Sample T-Tests Comparing Trait Variables from Time 1 to Time 3 for Intention-to-Treat Participants

	Time 1 *M (SD)*	Time 3 *M (SD)*	95% CI		*t*	*p*	η^2 (*d*)
			Lower	Upper			
Trait forgiveness	32.34	35.80	-5.32	-1.60	-3.78	.001	0.29
	(7.34)	(6.43)					(1.28)
Empathic concern	4.37	4.41	-0.17	0.09	-0.61	.543	0.01
	(0.52)	(0.55)					(0.20)
Perspective taking	3.94	4.07	-0.27	0.01	-1.93	.062	0.10
	(0.52)	(0.64)					(0.67)

Note. *N* = 35. *d* = Cohen's *d*.

Discussion

Study 1 aimed to determine whether participants who completed a six-module online forgiveness course scored higher on overall state forgiveness, other forgiveness-related outcomes (revenge, avoidance, emotional and decisional forgiveness, rumination about the offence, and empathy toward the offender) and psychological wellbeing (depression and stress) compared with a waitlist control group, and whether any changes were maintained at three-month follow-up. An additional aim was to assess whether participants who completed the course scored higher on trait forgiveness and empathy at three-month follow-up compared to baseline. In this discussion the main findings will be summarised in brief, and the significance of the findings in relation to previous research and theories of forgiveness intervention will be discussed. Implications of the present study for theory and psychological practice will be acknowledged briefly, with a more comprehensive discussion deferred until the thesis general discussion section. Discussion of the strengths and limitations of the current research will also be deferred until the general discussion.

The main findings of this study in relation to pre-post changes were as follows: 1) while the waitlist control group showed no improvements, participants who had completed the online REACH intervention improved at post-intervention on overall state forgiveness, emotional forgiveness, avoidance motivation, and rumination with large effect sizes, and on state empathy with a moderate effect sizes; 2) there was a tendency for IT participants to improve more than DT participants at post-intervention on stress, with a moderate effect size; 3) there were no post-course differences between groups in revenge, decisional forgiveness or depression; and, 4) improvements in the IT group were evident after controlling for group differences in severity of the offence, willingness to forgive, trait forgiveness and perspective taking.

In relation to follow-up measures, where a control group was not included, findings were as follows (continuing the numbering from previous paragraph) : 5) participants who completed online REACH (IT and DT combined) showed post-course improvements in state forgiveness, emotional forgiveness, decisional forgiveness, rumination, avoidance motivation and stress, but not in revenge motivation or depression; 6) participants who completed the REACH program maintained treatment gains in state forgiveness, emotional forgiveness, rumination, avoidance motivation, and stress from post-course to three-month follow-up, with a tendency for maintaining treatment gains in decisional forgiveness; 7) there was a tendency for post-course gains in state empathy for the offender to diminish in the months following the intervention; and 8) at follow-up compared to pre-intervention those who completed the REACH program showed a significant and large increase in trait forgiveness scores and a tendency for improvement in perspective taking, but this needs to be confirmed by research that includes a control group.

Post-Course Outcomes

Forgiveness-related outcomes. The hypothesis that participants who completed the REACH course would report higher levels of state forgiveness, emotional forgiveness and state empathy, and lower levels of rumination and avoidance motivation compared to waitlist controls was supported. Contrary to expectations, decisional forgiveness and revenge motivation were not significantly different when compared to waitlist controls.

Analyses for overall state forgiveness and state empathy revealed significant interaction effects. Similarly, multivariate analyses for emotional forgiveness, rumination and avoidance motivation also revealed significant overall and univariate interaction effects with large effect sizes. Post-hoc analyses and inspection of means confirmed that IT participants reported greater increases in forgiveness (or less unforgiveness) at Time 2 compared to participants in the DT

group. Significant results were all obtained after severity of the offence, willingness to forgive, trait forgiveness, and perspective taking were included as covariates to control for higher scores (except for severity which was lower) in the treatment group at baseline.

These results are consistent with previous studies finding that forgiveness targeted interventions improve forgiveness compared to no-treatment controls (Wade et al., 2014) and with other research evaluating the effectiveness of the REACH program in psychoeducational groups for community based adults (Allemand et al., 2013; Rye et al., 2005) and in self-directed workbook format (Greer et al., 2014; Harper et al., 2014). It is notable that in this study participants who completed the program reported both increased forgiveness (overall forgiveness, emotional forgiveness, state empathy) and decreased unforgiveness (avoidance, offence-related rumination), in support of forgiveness models which emphasise the gradual replacement of negative offender oriented emotions, cognitions and motivations with positive ones (McCullough et al., 1997). Large treatment versus control effect sizes for pre-post changes in overall forgiveness (η_p^2 = .43, equivalent to Cohen's *d* = 1.74; Cohen, 1988) and emotional forgiveness (η_p^2 = .34, equivalent to Cohen's *d* = 1.43) were greater than those observed in both secular and Christian versions of the REACH self-directed workbook (Cohen's *d* ranged from .5 to 1.37; Greer et al., 2014; Harper et al., 2014). As the latter results were themselves compared to standardised change scores in three to seven group REACH studies, finding that change in workbook participants was the same (Greer et al., 2014) or greater (Harper et al., 2014) than those who received in-person group interventions, a cautious conclusion is that the online REACH program may be at least as effective as other versions of the REACH model for those who complete the intervention. It should be noted that dropout rates in the current study were high, suggesting that effect sizes may be inflated.

The finding that REACH course participants increased on state empathy is consistent with the emphasis on empathic perspective taking and compassion for the offender in the REACH program (Worthington, 2001; Worthington et al., 2012). This result is also consistent with

previous research using the same measure (Goldman & Wade, 2012; Sandage & Worthington, 2010), although it contradicts findings in other studies (Wade & Meyer, 2009; Wade et al., 2009). Tentatively, these findings suggest that, as the state empathy measure in these studies is regarded as a measure of affective empathy, including compassionate and warm feelings towards the offender, changes in emotional empathy may be necessary to, or at least associated with, increases in emotional forgiveness. Previous REACH intervention studies have found that affective empathy has mediated change in forgiveness scores (McCullough et al., 1997; Sandage & Worthington, 2010) and time spent on an empathy component was found to be a significant predictor of forgiveness effect size in a meta-analysis of forgiveness interventions (Wade et al., 2005).

The non-significant finding for revenge is in contrast to previous research showing reductions in revenge motivation after completing a REACH program (Sandage et al., 2015; Shechtman et al., 2009; Wade & Meyer, 2009). For decisional forgiveness, some previous REACH studies found post-intervention effects (Greer et al., 2014; Harper et al., 2014; Sandage et al., 2015), whilst another did not (Y. Lin et al., 2014). Baseline scores for decisional forgiveness in this study were higher than those reported elsewhere (Greer et al., 2014; Harper et al., 2014; Y. Lin et al., 2014; Sandage et al., 2015) and revenge scores lower (Sandage et al., 2015; Shechtman et al., 2009; Wade & Meyer, 2009), suggesting that most participants who volunteered for the study and remained in it until Time 2, whether they received the intervention or not, were at least somewhat motivated to forgive and to forgo revenge at pre-intervention. A further point regarding the non-significant findings for revenge, is that other studies have reported results for revenge and avoidance combined (i.e., the TRIM scale total) (Greer et al., 2014; Harper et al., 2014), therefore similar non-significant findings for revenge may have been masked by strong reductions in avoidance or control group reductions in revenge.

In this study there was a large dropout rate of 51.5% overall (70.9% for those in the immediate treatment group and 21.6% for delayed treatment participants). This dropout rate is

high even considering attrition rates for internet-based mental health intervention studies ranging from zero to 50% (Christensen, Griffiths & Farrer, 2009) and an average treatment adherence (i.e., the extent that the participant experienced the content of the treatment) rate of 50% (Kelders, Kok, Ossebaard, & Van Gemert-Pijnen, 2012). Attrition analyses indicated that participants who completed Time 2 questionnaires (i.e., completers, *n* = 63), either as post-course or control measures, were more likely to be older in age than those who did not complete Time 2 (non-completers, *n* = 67). At baseline, those who went on to complete the study were also more likely to score higher in state empathy and in emotional and decisional forgiveness, and reported being less motivated to take revenge upon the people who had hurt them than non-completers; these differences all had small to medium effect sizes. These results indicate that the findings regarding the efficacy of the online REACH intervention are somewhat limited to those people who are comparatively older and more empathic, emotionally forgiving and non-vengeful towards their offender, and that the effectiveness of the program for people who are experiencing higher levels of unforgiveness, or who have not decided to attempt forgiving, is unknown.

Reasons for dropout are not certain, although those allocated to immediate treatment appeared to discontinue the study at all points of the program. In future studies of online forgiveness interventions, some means of identifying reasons for dropout would be a useful addition to the literature. In the current research, attrition is higher than that reported for forgiveness interventions offered face to face or by self-directed workbook, therefore consideration of the effectiveness of online REACH must be tempered by consideration of the likelihood that people who may not have benefitted from the program dropped out of the study prior to Time 2, thereby inflating the resultant study effect sizes. Factors affecting individual persistence with the REACH online program are the focus of Study 2.

Psychological wellbeing outcomes. The hypothesis that participants who completed the REACH course would report lower levels of stress and depression compared to waitlist controls

was partially supported for stress but not for depression. After including trait forgiveness and perspective taking as covariates to control for higher scores in the IT group at baseline, multivariate analyses showed no interaction effect for stress and depression when included together in a MANCOVA. However, when stress was examined on its own, a significant univariate interaction effect with moderate effect size was observed. Whilst post-hoc analyses did not reach significance in the current small sample, the moderate effect size and inspection of means suggested that IT participants tended to make greater improvements in stress at Time 2 than DT participants.

Inspection of estimated marginal means for stress for both conditions indicates that, after adjusting scores for the influence of covariates, IT participants may have been experiencing more subjective stress at baseline than control participants. Therefore, a conservative explanation is that the improvement in stress in the IT group could be explained by regression to the mean rather than as an effect of online REACH. Nevertheless, the finding that REACH participants reported reduced stress, whilst modest and requiring replication in a larger sample, is somewhat consistent with the proposition that forgiveness interventions have a positive effect on psychological wellbeing (Griffin et al., 2015; Toussaint & Webb, 2005) and with stress-coping models of forgiveness which consider unforgiveness as a stress reaction to a transgression (Strelan & Covic, 2006; Worthington, 2006). Although most previous forgiveness intervention research has not investigated stress as an outcome, these results are somewhat consistent with one previous study that found reductions in perceived stress associated with a group cognitive-behavioural forgiveness intervention (Harris et al., 2006), and with previous research indicating forgiveness interventions may be associated with improvements in general psychological wellbeing (Baskin & Enright, 2004; Sandage et al., 2015; Wade et al., 2014), reduced psychiatric symptoms (Goldman & Wade, 2012; Sandage et al., 2015; Wade & Meyer, 2009) and decreased negative affect (Freedman & Enright, 1996; W. F. Lin et al., 2004; Lundahl et al., 2008). In contrast to large effect sizes for improvements in forgiveness and other transgression-specific

outcomes, the effect size for the more generalised measure of subjective stress was moderate. This difference is consistent with meta-analytic findings (Wade et al., 2014) for psychological wellbeing outcomes of forgiveness interventions.

The non-significant finding regarding depression contradicts previous research showing improvements to depression following forgiveness interventions, including a meta-analysis of 10 studies (Wade et al., 2014) which showed a moderate effect size. A possible explanation for the absence of an effect for depression might be low baseline scores. However, in this study the average reported depression score (*M* = 11.38, *SD* = 4.86 for combined groups at baseline), whilst positively skewed (median = 9), is actually comparable to DASS-21 norms for a clinical sample (*M* = 10.65, *SD* = 9.30; Brown et al., 1997) and falls in the moderate to severe clinical range for the DASS-21 (S. H. Lovibond & Lovibond, 1996). Therefore the absence of an effect of online REACH on depression cannot be explained by floor effects. It is possible that non-specific factors explain findings from other programs; for example, meeting with similar people in group interventions may have a positive effect on mood. The absence of an effect for depression was replicated in the follow-up study reported below, which found no effect on depression among all completers of the REACH program.

Maintenance of Gains at Follow-Up

Forgiveness-related outcomes. The hypothesis that REACH course completers would maintain improvements in forgiveness-related outcomes at three-month follow-up was partially supported. Significant improvements in state forgiveness, emotional forgiveness, rumination, and avoidance motivation at T2 were maintained at T3, that is, there were no significant differences between T2 and T3. Significant post-course improvements in decisional forgiveness and state empathy were not maintained at follow-up, although the reduction between T2 and T3 was non-significant. Consistent with findings reported above for the IT versus DT comparison,

the hypothesis was not supported for revenge. As for the pre-post outcome analyses described above, REACH course completers did not show improvements in revenge motivation at either T2 or T3 compared to baseline scores.

Both completer and intention-to-treat analyses revealed main effects for time for state forgiveness, emotional forgiveness, avoidance motivation and rumination, with large to very large effect sizes (η_p^2 from .33 to .66), with pairwise comparisons indicating significant improvements with large effects from T1 to T2, T1 to T3 and non-significant changes from T2 to T3. These results indicate that, for participants who completed the REACH course (i.e., the IT and DT groups combined), significant improvements in overall state forgiveness, emotional forgiveness, avoidance motivation and rumination were observed at post-course and maintained for three months after completing the program.

A similar pattern was observed for decisional forgiveness and state empathy. Both completers and intention-to-treat analyses showed significant time effects with large effect sizes, and pairwise comparisons indicated that intervention participants made significant post-course improvements; however, these were diminished by three-month follow-up. For decisional forgiveness this T2-T3 decrease was small, with a large effect size still observable from T1 to T3, suggesting that with a larger sample the results may have reached significance. As there was no control group at follow-up, and recalling that both IT and DT groups showed significant increases in decisional forgiveness from baseline to post-test, it is likely that these effects are unrelated to the intervention and may be a product of time and/or the salience of the study. Hence it is important that these results are replicated in an extended study with a no-intervention control at follow-up.

For state empathy, the decline in scores in the months following treatment accounted for about half the gains made at post-test. Whilst few studies have measured empathy as an outcome, examples have included a forgiveness seminar which was associated with gains in

empathy at post-test which increased further by six-week follow-up (Sandage et al., 2010), and another study which used REACH to help adolescents overcome unforgiveness and hostility towards a rival group found empathy scores in the treatment group continued to increase to three-month follow-up (Shechtman et al., 2009). Therefore the results of the current study, which suggest a tendency for post-course gains in state empathy for the offender to diminish in the months following the intervention, are in contrast to previous research which has found that empathy continued to increase following a forgiveness intervention.

Analyses for revenge motivation found a near significant time effect with a large effect size. Pairwise comparisons showed a large improvement from T1 (*M* = 1.29, *SD* = 0.47; untransformed mean scores) to T2 (*M* = 1.19, *SD* = 0.45) which was reversed from T2 to T3 (*M* = 1.35; *SD* = 0.53). Cautiously, these results suggest that post-course reductions of less than a quarter of one standard deviation in revenge motivation may be both clinically insignificant and temporary.

Psychological wellbeing outcomes. The hypothesis that REACH course completers would maintain improvements in psychological wellbeing outcomes at three-month follow-up was partially supported. For stress, significant improvements at T2 were maintained at T3. Consistent with findings reported above for the IT versus DT comparison, the hypothesis was not supported for depression.

Both completer and intention-to-treat analyses revealed a significant effect of time (T1 to T3) for stress with a large effect size ($\eta^2 = .17$ in the ITT analysis), and pairwise comparisons indicated significant improvements. These results indicate that participants made improvements in stress which were maintained for three months after completion. The results are consistent with the one previous study that examined perceived psychosocial stress as an outcome of a forgiveness intervention, that observed significant reductions in stress compared to a control group at four-month follow-up with a moderate effect size (Harris et al., 2006). Together with

the finding that stress for REACH participants was lower at post-test than in the control group, reported above, this is an important addition to the REACH intervention literature as it suggests that people completing the program in self-help online format may experience decreases in stress that are maintained over time. However, further longitudinal research examining the maintenance of forgiveness intervention effects over longer periods, and in comparison with a control group, is needed.

Trait forgiveness and trait empathy. The hypothesis that REACH course completers would show increases in trait forgiveness from baseline to three-month follow-up was supported. Contrary to expectations, trait empathic concern and perspective taking were not significantly different but there appeared to be a strong tendency for an improvement in perspective taking.

Both completer and intention-to-treat analyses revealed a significant increase in trait forgiveness scores between Time 1 and Time 3 with large effects sizes. The increase in perspective taking scores approached significance (p = .062) and showed a moderate to large effect size, suggesting that, with more power, a significant change in perspective taking might be observed. These results suggest that, according to self-reports, people were more inclined to forgive others across a range of situations three months after completing online REACH.

The finding that online REACH participants improved on trait forgiveness is consistent with Hill and colleagues' (2013) suggestion that trait forgiveness may be improved or acquired as a result of a forgiveness promoting intervention. These improvements are also consistent with previous findings in a clinical sample (Sandage et al., 2015), although in contrast to research with Christian university students, in which significant changes to trait forgiveness did not occur (Lampton et al., 2005). In the latter study baseline trait forgiveness was already at high levels (M = 37.3, SD = 6.11) compared to published norms for college students (M range = 30.4 – 36.3; SD range = 5.04 – 7.47; Berry et al., 2005) whereas the participants in the present study had lower

trait forgiveness scores (*M* = 32.13, *SD* = 7.64) suggesting they may have had more room to improve. Similarly, Greer and colleagues (2014) found significant improvements in trait forgiveness from baseline (*M* = 30.20, *SD* = 6.64) in the REACH self-directed workbook group. However, improvements of similar magnitude were also observed in the waitlist group so these changes were attributed to motivation to be more forgiving, related to volunteering for the study, rather than to the intervention. Similarly, trait forgiveness improvements in the current study cannot necessarily be attributed to the effects of the REACH intervention as trait measures were not included at post-course when a control group was available for comparison. Nevertheless, along with the trend towards significance for improvements in empathic perspective taking which is targeted as a forgiveness-related skill in the REACH intervention, the increases in trait forgiveness are potentially meaningful results which need replication in longitudinal studies in which a control group is also utilised at follow-up. Given the accumulated evidence supporting the association between forgivingness and physical and mental wellbeing, interventions which target generalised forgivingness rather than, or in addition to, forgiveness of a specific transgression or offender may provide significant benefits to individual wellbeing.

Summary of Findings from Study 1

In summary, the online, self-directed adaptation of REACH evaluated in the present study was effective at increasing overall forgiveness, emotional forgiveness and state empathy, and reducing avoidance of the offender, rumination about the offence, with a near significant effect for reduction of stress when compared to those in a waitlist control condition and after controlling for baseline scores in severity of the offence, willingness to forgive, trait forgiveness and perspective taking. Most treatment effects, with the exception of state empathy, were maintained for three months. Importantly, as few studies have examined the possibility that forgiveness promoting interventions may have an effect on trait forgiveness, participants in this

study reported a greater cross-situational tendency to forgive three months after completing the online REACH program.

Online adaptations of evidence-based psychological programs offer important opportunities for people unable to access expensive and time-consuming individual and group specialist programs in forgiveness therapy. Whilst research into self-directed workbook versions of REACH have shown promising results (Greer et al., 2014; Harper et al., 2014), previous forgiveness intervention research had not evaluated a self-directed forgiveness intervention offered with the additional benefits of online technology. However, the high rate of attrition from this study, whilst not unusual for internet-based interventions, suggests that the positive outcomes for completers in this study should be interpreted with caution as they may be limited to people with specific attributes. Accordingly, the factors associated with early dropout and engagement in the REACH program are the focus of Study 2, whilst factors which moderate the effectiveness of the program are investigated in Study 3.

Study 2: Factors Predicting Persistence with the Online REACH for Forgiveness Program

Overview of Study 2

As highlighted in the previous chapter, Study 1 showed that a self-directed, online adaptation of the REACH program was effective in promoting forgiveness and relieving stress for participants who completed the program, and that these outcomes were sustained for three months following the intervention. However, the study reported high attrition rates of 51.5% overall, and 70.9% for those participants given immediate access to the REACH program. Given the apparent benefits of online REACH, it is important to identify factors such as individual differences or early program experiences which might contribute to people not starting REACH or discontinuing after commencing work in the course modules. If these factors are understood, improvements might be made to the promotion, contents or delivery of REACH and other forgiveness promoting programs, to target the most appropriate populations and facilitate wider uptake. Therefore the broad aim of Study 2 was to understand individual differences, situation related factors, and early program behaviours predicting participants' engagement in, and persistence with, the online REACH program.

Definitions and measurement of adherence and attrition. In the current study, intervention outcomes for those who dropped out before completing post-course outcome measures are unknown. However, previous research suggests poor adherence to internet-based therapies reduces treatment effects (Donkin et al., 2011; Kelders et al., 2012). In the literature reporting internet-based therapies, adherence is distinguished from attrition as follows: attrition, or dropout, refers to study participants who do not complete outcome measures as defined in the research protocol, whereas adherence refers to the extent to which individuals experience the content of an intervention (Christensen et al., 2009; Kelders et al., 2012; Mohr,

Cuipers, & Lehman, 2011). These concepts are more distinct in the medical literature, where adherence refers to the extent to which a person's behaviour is consistent with health care recommendations (Dunbar-Jacob & Mortimer-Stephens, 2001), and typically includes both compliance with prescribed medications and doctors' recommendations regarding health behaviours (Hill & Roberts, 2011). In the current study, as with many studies involving treatments administered over time, these concepts overlap. For example, in the immediate treatment group, Time 2 data was only collected from those who completed the treatment; meaning that all non-adherent participants were dropouts, and all dropouts were non-adherent, although some persisted with the treatment for longer than others. Therefore, previous research regarding both dropout and adherence may be relevant when considering factors predicting early dropout of the current study, as well as those predicting how far people persist with the intervention.

Adherence to online health programs has been operationalised in a number of ways, including number of logins, time on site, number of modules completed, and number of characters or words typed into the site (Mohr et al., 2011). These measures thus describe adherence in terms of the degree to which a program has been completed, or the extent of engagement in program activities. In Study 2, whilst factors associated with early dropout prior to starting the intervention was considered initially, the extent of completion of the REACH program is the main focus. Adherence in Study 2 was described as persistence with REACH and was measured in terms of the number of successive modules attempted. In addition, engagement in the early stages of the program, measured by time spent and words typed during Module 1, will also be considered as a potential predictor of persistence with REACH. If it could be established that behaviours predicting later disengagement were observable during early stages of the program, then additional interventions such as reminders, additional support or program customisations could be developed to increase the likelihood of disengaged participants persisting with the program.

Adherence in forgiveness intervention studies. While adherence to medical treatment regimens has been the subject of decades of research (Di Matteo, 2004; Dulmen et al., 2007), dropout and adherence in forgiveness intervention studies is less well understood. Where reported, study dropout and treatment adherence rates in forgiveness intervention studies are highly variable, with few studies commenting on reasons for dropout or non-adherence.

In a study of forgiveness treatment compared to treatment as usual for participants recruited from drug rehabilitation centres, W. F. Lin and colleagues (2004) reported a treatment completion rate of 35% for both conditions, attributing the high attrition to the severity and complexity of participants' comorbid psychological and substance abuse disorders. Another study of adult children of alcoholics recorded a treatment completion rate of 63%, which was attributed to participants' personal reasons, moving away, and pregnancies (Osterndorf et al., 2011). In two other studies of community-based participants, completion rates for those allocated to treatment conditions included 80% for a four-week group program (Wade & Meyer, 2009) and 81% for an eight-week group program (Rye et al., 2005). Studies in student populations recorded adherence rates in treatment groups from 90 – 93% (Y. Lin et al., 2014; Wade et al., 2009).

Of most relevance to the current study, one self-directed REACH workbook study reported an overall dropout rate of 20% (i.e., 13 of the 65 randomised participants failed to complete all measures), with 76% of the immediate treatment group completing the workbook and post-course measures (Greer et al., 2014). In contrast, the other self-directed workbook study reported an overall dropout rate of only 5%, with all participants allocated to immediate treatment completing the intervention (Harper et al., 2014). In both workbook studies, participants received course credit for participation, which may have contributed to retention. In the current study, the completion rate for REACH in the immediate treatment group of 29% was low in comparison to these self-directed workbook studies. A significant concern in relation to high attrition and low adherence in treatment effectiveness studies is the possibility that

effect sizes are inflated by elimination of participants who may not have benefited from the intervention. Therefore, in Study 2, potential predictors of persistence with the REACH program were explored.

One explanation of the high attrition and low adherence noted in Study 1 in comparison to other forgiveness intervention studies may be the online delivery mode of the intervention. However, one review found that adherence rates (ranging from 50% to 100%) for online treatments delivered in the context of RCTs were similar to those reported in non-internet based RCTs (Christensen et al., 2009). Several reviews have examined factors which predict adherence in research into internet interventions, with factors predicting greater online treatment adherence including lower baseline rates of depression or anxiety symptoms, younger age, the study being an RCT rather than an observational study, more interaction with a counsellor, and more frequent intended usage of the program (Christensen et al., 2009; Kelders et al., 2012). However, few, if any, studies have focused on individual differences in personality or situation proximal attitudes relevant to the intervention as possible predictors of adherence to, or persistence with, the treatment being offered.

Personality factors associated with treatment adherence and health behaviours. Research into the influence of personality variables on adherence to health treatments has largely focused on medication adherence. The five-factor model (or Big Five) has been widely adopted as a consensual framework for individual differences in personality (McCrae & Costa, 2003). The five factors are usually labelled extraversion, neuroticism, agreeableness, conscientiousness and openness to experience. The personality factors most commonly associated with treatment adherence are conscientiousness, agreeableness and neuroticism. A pattern of associations between conscientiousness and agreeableness and higher treatment adherence, and neuroticism with poorer adherence, was observable in several studies: an epidemiological study (*N* = 749) of people with chronic disease (Axelsson, Brink, Lundgren, & Lotvall, 2011), a population-based study (*N* = 445) of adherence to antibiotic medication

(Axelsson, 2013), and a study of adolescents with Type I diabetes (Wheeler, Wagaman, & McCord, 2012). Conscientiousness also predicts better adherence to prescribed medications in patients with high cholesterol (Stilley, Sereika, Muldoon, Ryan, & Dunbar-Jacob, 2004) and in renal patients (Christensen & Smith, 1995), and better adherence with multiple sclerosis disease-modifying therapies (Bruce, Hancock, Arnett, & Lynch, 2010). Higher scores on neuroticism have been associated with non-adherence to medication in a six-year RCT placebo controlled trial of *Gingko biloba* for prevention of dementia (Jerant, Chapman, Duberstein, Robbins, & Franks, 2011) and with poor treatment adherence in multiple sclerosis patients (Bruce et al., 2010). However, personality traits were not related to medication adherence in men and women living with HIV/AIDS (Penedo et al., 2003). Studies focused on other health related behaviours have noted similar associations. For example, exercise behaviours in undergraduates have been positively correlated with conscientiousness and negatively correlated with neuroticism (Courneya, & Hellsten, 1998).

In relation to broader health promoting behaviours, although each of the five personality dimensions have been related to various aspects of health, evidence for the association between high conscientiousness and health related behaviour is especially strong (Hill & Roberts, 2011; Raynor & Levine, 2009; Roberts, Walton & Bogg, 2005). Conscientiousness is believed to be related to health promoting behaviours via conscientious individuals being more likely to be constrained by long term consequences of their behaviours, or by a sense of responsibility to uphold social norms and avoid trouble (Bogg and Roberts, 2004). One study of male U. S. Navy enlisted personnel found significant associations between all of the Big Five personality factors and wellness behaviours, accident control, and traffic risk taking. However, after controlling for the effects of other personality factors, only conscientiousness was a significant predictor of health promoting behaviours (r_p = .27) and accident control (r_p = .43; Booth-Kewley & Vickers, 1994). Another cross-sectional study (*N* = 583) found that college students high in conscientiousness were more likely to wear seat belts, exercise, get enough

sleep, eat fruits and vegetables, and less likely to smoke cigarettes and binge drink (Raynor & Levine, 2009). Similarly, a meta-analysis of 194 studies found that conscientiousness-related traits were negatively related to all risky health-related behaviours and positively related to all beneficial health-related behaviours (Bogg & Roberts, 2004). In a large cross-sectional study (*N* = 2136), conscientious individuals reported greater adherence to doctor suggestions, greater medication adherence, and better perceived health (Hill & Roberts, 2011).

Although mostly related to the taking of medications or avoidance of risky behaviours, these findings represent evidence of associations between personality traits and behaviours related to better health. To the extent that engaging in a forgiveness intervention could be construed as a health behaviour, these findings may have some relevance to patterns of engagement in, and persistence with, online REACH. Just as those who score higher in conscientiousness and agreeableness, and lower in neuroticism, may be more compliant with medication regimes and more motivated to persist with other health-related behaviours despite inconvenience, side effects, social pressure, or time constraints, they may also be more motivated to persist with the REACH intervention despite the associated emotional responses and high time commitment required. Hence these variables were examined as potential predictors of persistence with REACH in Study 2.

Personality and coping with stress. The influence of personality traits on styles of coping with stress or distress may have particular relevance for engaging in forgiveness interventions. Forgiveness has been described as an emotion-focused coping strategy to aid in overcoming the distress associated with unforgiveness (Worthington & Scherer, 2004). Stress and coping theories of forgiveness frame interpersonal transgressions stressors, and emphasise forgiving as a process which facilitates coping (Strelan & Covic, 2006; Worthington, 2006). An important way of understanding coping is to distinguish between engagement coping, which is directed towards dealing with the stressor or related emotions, and disengagement coping which is aimed at escaping threat or distress (Carver & Connor-Smith, 2010; Skinner, Edge, Altman, & Sherwood,

2003). Actively working on forgiveness of an offender may be understood as a form of engagement coping. Therefore, early dropout from a forgiveness intervention study may be understood in terms of disengagement coping, where participants may prefer to retreat from feelings of distress or avoid deeper engagement in transgression-related reflection. Similarly, persistence with the program could be understood as engagement coping, whereby participants are actively seeking support and strategies to deal with their unforgiveness-related distress in new ways.

A meta-analysis of 165 study samples found weak but significant relationships between all personality factors and broad engagement and disengagement coping (Connor-Smith & Flachsbart, 2007). Examination of larger effects suggests links as follows: extraversion, conscientiousness, and openness to more engagement coping; neuroticism to more disengagement coping; and, conscientiousness and agreeableness to less disengagement coping. In relation to persistence with a forgiveness intervention, these results suggest that people may be more inclined to persist with the program if they score higher in conscientiousness, extraversion, openness, and agreeableness, and lower in neuroticism (Connor-Smith & Flachsbart, 2007). Considered alone, these links may not be strong enough to warrant hypotheses regarding persistence with the REACH program; yet in combination with the accumulated evidence linking conscientiousness and neuroticism to health behaviours and treatment adherence, it might be expected that participants scoring high in conscientiousness and low in neuroticism would be likely to persist further with the intervention. Similarly, more agreeable individuals, often characterised as concerned with maintaining relationships (Carver & Connor-Smith, 2010), are more likely to forgive specific transgressions (Fehr et al., 2010; Riek & Mania, 2012) and thus may be more persistent with an intervention designed to support this process.

Individual differences in forgiving and forgivingness. Of the five-factor model personality traits, agreeableness and neuroticism have been most frequently and strongly

associated with both the disposition to forgive and state forgiveness in meta-analytic (Riek & Mania, 2012) and systematic reviews (Mullet et al., 2005). Agreeable individuals are empathic, interested in other people, and concerned with the maintenance of positive relationships (McCrae & Costa, 2003). Although they are believed to experience less conflict (McCullough, 2001), agreeable individuals who have enrolled in a forgiveness intervention may be motivated to complete the program in order to resolve unforgiveness which they may experience as especially unpleasant (McCullough & Hoyt, 2002). Neuroticism is associated with the tendency to experience negative emotions (McCrae & Costa, 2003), and is believed to inhibit forgiveness due to high levels of negative emotional response to interpersonal transgressions, more frequent interpersonal distress, and a tendency to ruminate over negative events (McCullough & Hoyt, 2002; Walker & Gorsuch, 2002). People high in neuroticism may be less likely to persist with a forgiveness intervention due to difficulties regulating negative emotions and rumination associated with increased exposure to thinking about the offender and the transgression. A meta-analysis combining studies of state and trait forgiveness (Riek & Mania, 2012) found that agreeableness (r = .37) and neuroticism (-.27) showed the strongest correlations with forgiveness of the personality variables. However, for both these results the samples were drawn from studies primarily examining trait forgiveness. Koutsos, Wertheim and Kornblum (2008) examined the role of personality variables in predicting both dispositional and state forgiveness, finding that agreeableness and neuroticism predicted disposition to forgive. However, only agreeableness predicted forgiveness of a specific transgression, and that relationship was fully mediated by dispositional forgiveness (Koutsos et al., 2008).

Individual differences related to forgiving specific transgressions may also affect motivation and behaviour related to a forgiveness intervention program. Forgiveness-related traits have been associated with increased likelihood of forgiving a specific transgression (Fehr et al., 2010; Koutsos et al., 2008; Riek & Mania, 2012) and one explanation of these associations may be a willingness to engage in forgiveness-related coping processes such as regulating the

emotions associated with unforgiveness, attempting to empathise with an offender, or participating in a forgiveness-promoting program. For example, people high in trait forgiveness and trait empathy appear more likely than others to forgive specific transgressions (Fehr et al., 2010; Riek & Mania, 2012) and may also be more inclined to persist with an activity that is consistent with their pro-forgiveness values and previous experiences.

Situation specific predictors of forgiveness. Attitudes, beliefs, and situational factors in the context of specific interpersonal transgressions are also recognised as predictors of state forgiveness (Fehr et al., 2010; Koutsos et al., 2008; McCullough et al., 1998). Blatt and Wertheim (2015) identified seven social-cognitive factors which facilitate or inhibit forgiveness, including perceptions about the offender or the offence, perceived social influences on forgiving, and beliefs about the meaning of forgiveness. For example, people who believe that forgiving an offender is equivalent to condoning or minimising the offending behaviour were less likely to forgive, whereas those who believe the offender is unlikely to repeat the hurtful behaviour were more likely to forgive (Blatt & Wertheim, 2015). Similarly, forgiveness may be inhibited by social influences such as other people suggesting forgiveness be withheld, or facilitated by spiritual beliefs encouraging the believer to forgive, remorse or apology by the offender, highly valuing the relationship with the offender, or a belief that the offender's intent was non-malicious. Multiple regression analyses predicting overall forgiveness (N = 415) found that all seven factors in the Factors Related to Forgiveness Inventory (FRFI) contributed uniquely to variance in overall state forgiveness, with the seven-factor model predicting 52% of the variance in forgiveness (Blatt & Wertheim, 2015). Social-cognitive factors such as these may predict persistence with a forgiveness promoting intervention to the extent that they affect motivation to work towards forgiveness, or alignment of the program and its intended outcomes with personal values and beliefs. For example, people whose spiritual beliefs emphasise forgivingness as a desired personal quality may be more likely to persist with the online REACH intervention, whilst those

who believe forgiveness would mean they condoned the transgressive actions of their offender may be less likely to engage with the program as it may appear inconsistent with their views.

The degree of transgression-related distress may also impact on adherence to a forgiveness promoting program. Research cited earlier in this overview suggests that high symptomology or distress at baseline may be associated with dropout from a forgiveness program (W. F. Lin et al., 2004), low adherence to internet-based interventions (Christensen et al., 2009), lower adherence to treatment instructions in group CBT for social phobia (Edelman & Chambless, 1995), and poor adherence with multiple sclerosis disease-modifying therapies (Bruce et al., 2010). These results suggest that high transgression-related distress, for example baseline levels of unforgiveness, rumination, stress or depression, may increase the likelihood of negative emotions occurring in response to REACH program exercises, thus inhibiting motivation to persist with the program. Given these earlier findings, and the paucity of research into predictors of dropout or adherence in forgiveness interventions, the current study included an exploration of relationships between transgression-related distress and persistence with online REACH. If such relationships existed, alternative forgiveness interventions such as those actively facilitated by a counsellor or psychologist may be recommended for people reporting high transgression related distress.

Early program behaviours as predictors of intervention persistence. Another limitation of the forgiveness intervention literature and of treatment studies in general, is the lack of investigation into early program engagement behaviours which predict later dropout or non-adherence. Identification of early indicators of disengagement in internet-based interventions could function as early warning signs which trigger program modifications such as contact by a counsellor, increased dialogue support (reminders, encouragement), or alterations to online exercises. Based on the assumption that previous behaviour may predict future behaviour, participants who appear to be engaged in the program at an early stage may be more likely to continue with the program. In the current study, participants' early adherence to program

demands were measured in terms of words typed and amount of time spent completing Module 1, and completion of an exercise demonstrating commitment to working towards forgiveness. These variables were evaluated as possible indicators of subsequent persistence with the REACH program.

Summary of Study 2 overview. In summary, a significant gap in the forgiveness intervention literature is the lack of research investigating individual differences, factors related to the transgression, and early program behaviours in attrition and adherence to forgiveness promoting programs. Similarly, previous research investigating adherence to online interventions has focused on factors relating to program or system design rather than participant dispositions, attitudes, or behaviours. Previous research has suggested that personality traits conscientiousness, agreeableness, and neuroticism predict adherence to medical treatment regimens (Axelsson et al., 2011), and that conscientiousness is a consistently demonstrated predictor of positive health behaviours (Bogg & Roberts, 2004). Personality traits have also been shown to correlate with styles of coping with stress, with conscientiousness associated with both greater engagement coping and less disengagement coping, whilst neuroticism is associated with more disengaged styles of coping (Carver & Connor-Smith, 2010). Taken together with associations between personality and forgiveness (Koutsos et al., 2008; Riek & Mania, 2012), these findings from the broader health literature suggest that personality may also predict persistence with a forgiveness promoting intervention.

Factors influencing participants to dropout of a study early may be the same or different to those factors which contribute to participants' disengaging after commencing activities in the intervention program. An understanding of the factors associated with both early dropout and non-adherence to online REACH may facilitate improved evaluation of the program's effectiveness, help identify people most likely to engage in and complete the program, and suggest improvements to the program for future research. Finally, if it could be established that behaviours predicting disengagement were observable during early stages of the program, then

additional interventions such as reminders, social support or program customisations could be developed to increase the likelihood of disengaged participants persisting with the program.

Aims and Hypotheses

The current research has demonstrated the effectiveness of a forgiveness-promotion intervention offered in an interactive online, self-help format, for those who complete the program. Study 2 had one preliminary aim, concerning factors predicting early attrition from the study prior to beginning online REACH, and two main aims which concern dispositional factors and early program behaviours predicting persistence once the program has been commenced.

A preliminary aim of Study 2 was to investigate factors predicting attrition from the study prior to beginning the REACH program. Early dropouts from the study (participants who consented to begin online REACH but did not click to enter Module 1) were compared with REACH starters (participants who commenced the program) on all demographic and trait variables, situation variables, social-cognitive factors related to forgiveness and outcome variables at baseline. Given the lack of previous research into reasons for early attrition from forgiveness intervention studies, these analyses were largely exploratory. People who have withdrawn prior to starting the REACH program may have done so for reasons unrelated to their response to contents of the program. However, it could be assumed that people who are generally inclined to be forgiving and have indicated a willingness to forgive the identified offender may be motivated to commence the program. Similarly, more conscientious individuals may be motivated to commence the program out of a sense of duty to complete the research study they have enrolled in. Therefore, it was hypothesised (Preliminary H2.1) that, of participants given immediate access to the REACH program, those who did not commence REACH would report lower scores on trait forgiveness, willingness to forgive, and conscientiousness than those who started the REACH program.

The primary aim of Study 2 was to understand the dispositional factors which predicted participants' persistence with online REACH once initiated. Persistence was operationalised as the number of modules attempted or completed prior to dropping out or completing post-course measures. Generally, it was expected that participants with traits which are consistent with the ideas presented in the REACH intervention (e.g., trait forgivingness and empathy) would be more likely to persist with an intervention that fits with their views. Similarly, people prone to empathising were expected to be less resistant to completing exercises asking them to empathise with the offender. Accordingly, it was hypothesised (H2.2) that higher trait empathy and trait forgiveness scores at baseline would be associated with greater persistence with the REACH program. In addition, and based upon previous research linking personality traits with treatment adherence, health behaviours and coping styles, it was hypothesised (H2.3) that higher scores in conscientiousness and agreeableness, and lower scores in neuroticism, would be associated with greater persistence with REACH. The remaining personality factors, extraversion and openness to experience, were not included in hypotheses as the accumulated evidence for associations between personality and treatment adherence, stress and coping, and forgiveness (as reviewed above) did not support a prediction regarding persistence with a forgiveness promoting intervention. Nevertheless, extraversion and openness, along with the social-cognitive factors associated with forgiveness, situation related factors, and outcome measures at baseline were also included in exploratory analyses.

A final aim of Study 2 was to investigate whether early program behaviour predicted subsequent persistence with REACH. Early program engagement behaviours were operationalised as number of words typed during Module 1, estimated and actual time spent on Module 1, and the participant's response to a contract signing activity indicating commitment to working towards forgiveness. Given the association between conscientiousness and health promoting behaviours, and previous research findings of an association between duration of forgiveness interventions and effectiveness (Wade et al., 2014), it was predicted (H2.4) that, for

those participants who complete Module 1, higher early program engagement (time spent and words typed) would be associated with greater subsequent persistence with REACH. Similarly, due to the expected cognitive dissonance that participants may experience if they commit to the program and subsequently drop out, it was hypothesised (H2.5) that people who signed a declaration of their intent to forgive in Module 1 would be more likely to persist with the REACH program than people who did not sign the declaration.

Method

Participants

The sample used in this study was drawn from Study 1. Participants for the current study included all those allocated to the immediate treatment group, that is, all those given immediate access to online REACH (*n* = 79). DT participants were excluded as the tasks they had been asked to complete were different from the IT group. The DT group completed an additional questionnaire (i.e., at Time 2 prior to an intervention) before gaining access to the REACH program, therefore the meaning of the persistence scores for IT and DT groups would be different. Of the 79 participants given immediate access to the REACH program, only 62 (78.5%) commenced the REACH program by clicking on the link to enter Module 1. This sample of REACH starters were used in persistence analyses involving pre-program predictors (i.e., dispositional variables), whilst only those who completed Module 1 (*n* = 48) were included in persistence analyses involving early program behaviours.

Materials

The measures and online forgiveness intervention used in this study are the same as those described for Study 1 (materials, p. 61; see also Appendix B). Further measures used in Study 2 are described below. In addition, key measures of participant engagement and adherence were developed for Study 2 and are described below.

Social-cognitive factors related to forgiveness. The Factors Related to Forgiveness Inventory (FRFI; Blatt & Wertheim, 2015) assesses social-cognitive factors that facilitate or inhibit forgiveness of a specific transgression. Factors include positive offender post-offence responses (POR), condoning-related beliefs (CRB), relationship value (RV), spiritual beliefs promoting forgiveness (SB), social influence not to forgive (SI), belief that offender is unlikely to re-offend

(UTR) and belief in the non-malicious intent (NMI) of the offender, with the number of items in each subscale ranging from three to five. Participants indicated their agreement with statements such as “the offender has apologised” and “I believed the person would never do it again” on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

For the current study, seven items were added to the original 26-item FRFI to assess empathic responses towards the offender and humility related to one’s own offending. For a proposed empathic responses factor, items were adapted from the IRI perspective taking (e.g., “I have been able to see the situation from the perspective of the person who hurt me”), and empathic concern (“I have felt sorry for the person”) subscales, as well as two further items (“I can sympathise with what may have led the person to do what they did” and “I have thought about the painful experiences that may have led them to do what they did”). Together, these items were intended to measure state empathy towards a specific interpersonal offender comprising both affective and cognitive empathic responses. Items for a transgression-related humility factor were: “I am aware that I have also done hurtful things towards others in my own life”, “I can imagine that in similar circumstances I may also behave hurtfully towards others”, and “I have thought about how we are all capable of wrongdoing”. Parallel to the original FRFI factors, mean subscale scores were calculated for each factor, with higher scores indicating stronger endorsement of the relevant factor. FRFI items are shown in Appendix B.

Cronbach’s alphas ranged from .76 to .91 (Blatt & Wertheim, 2015) for the original seven subscales. Construct validity has been supported by correlations ranging from .45 to .75, with measures theoretically most closely related to each FRFI subscale highly correlated with expected FRFI scales (Blatt & Wertheim, 2015). For the current sample of REACH completers (n = 36), Cronbach’s alphas for the original FRFI factors measured at Time 1 ranged from .74 to .92 and mean inter-item correlations ranged from r = .42 to .80, indicating good internal reliability for very brief measures. For the proposed four-item empathic responses factor, α = .70, the mean inter-item correlation was .37 and the corrected item-total correlations ranged from .43 to

.51 which indicates acceptable internal reliability. For the new three-item humility factor, α = .72, mean inter-item correlations = .47 and corrected item-total correlations ranged from .40 to .68, which was also deemed acceptable.

Persistence with the REACH program. A measure of persistence with the REACH program was developed for this study. Persistence scores were allocated to each participant based upon the place in the program where the participant was last active. Values formed an ordinal scale from 0 = *did not start the REACH program* to 6 = *completed module 6 (finished REACH program)*. Logging into a module without entering any data was allocated a 0.1 increment, whilst partial completion of modules was represented by 0.5 increments. For example, a participant who opened Module 1 without entering any data was allocated a score of 0.1, a participant who completed Modules up to and including Module 3 and then partially completed Module 4 was given a score of 3.5, and so on.

In the current study, 17 (21.5 %) participants did not begin the REACH program, 19 (24.0 %) completed part or all of Module 1 before discontinuing the program, and a further 18 (22.8%) participants completed further modules before discontinuing the study. The part or full module completed prior to drop-out is shown in Table 18, in which it can be seen that more participants discontinued the program in the early stages, whilst fewer dropped out during later modules. As noted in Study 1, of the 79 participants initially allocated to commence the REACH program, 23 (29.1%) completed the program in full.

Table 18

Persistence with Online REACH Shown in Frequencies of Last Partial or Full Module Completed

Module started prior to drop-out	Partial module	Completed module	Cumulative attrition (%)
Did not begin REACH			17 (21.5%)
Module 1	14	6	37 (46.8%)
Module 2	-	5	42 (53.2%)
Module 3	4	2	48 (60.8%)
Module 4	1	4	53 (67.1%)
Module 5	-	2	55 (69.6%)
Module 6	1	23	56 (70.9%)

Note. *N* = 79.

Estimated and actual time taken to complete REACH Module 1. At the end of each REACH module, participants were asked to estimate the time taken to complete the module ("How much time did you spend actively working through this module?") on an ordinal scale from 1 = *less than 15 minutes* to 7 = *more than 2 hours*. The actual time taken (in minutes) to complete each module was obtained from the Qualtrics survey system, and is calculated as the time elapsed between starting and ending the module. Actual time taken is assumed to include time when some participants took breaks or faced interruptions. In this study, only time taken to complete Module 1 was included in analyses. The correlation between estimated and actual time taken to complete Module 1 was significant and substantial, *rho* = .61, suggesting that participant estimates of time spent on the module were reasonably accurate.

Words typed by participants in REACH Module 1. Each REACH module involves participants in a range of reflective exercises and questions requiring written responses. The full text of each participant's responses to the modules was downloaded from the Qualtrics website and the words typed by participants were extracted and exported into a Word document, from which a word count was calculated.

Declaration of intent to forgive. In Module 1 of REACH, participants were asked to indicate their intention to use the REACH program to work towards forgiveness of their offender by downloading, completing and signing a contract. Participants indicated either that they had 1 = *signed* the contract, 2 = *not signed* it, or 3 = *not yet signed* the contract.

Procedure

The procedure for this study was as described in Study 1 for recruitment of participants, completion of baseline measures (Time 1) and randomisation to immediate treatment (IT) and delayed treatment (DT) conditions (see sections Participants, p. 59, and Procedure, p. 72). Data from IT assigned participants only was analysed for the current study. As described in Study 1, IT participants were invited to begin the online REACH course immediately and were directed by hyperlink to the study website, "Learning Forgiveness", from which they could access each REACH module in sequence.

Design and Analysis

Persistence with REACH was the primary outcome variable in the following analyses. As persistence comprises ordinal level data, nonparametric analyses such as Spearman's Rank Order Correlation (*rho)* and logistic regression were utilised for analyses including this variable.

Attrition analyses comparing REACH non-starter versus starter participants (H2.1). Independent samples *t*-tests compared participants who did not start the REACH program (*n* = 17) with those who started the REACH program by entering Module 1 (*n* = 62) on the hypothesised variables and in an exploratory way on the remaining potential predictor variables. Although independent samples *t*-tests are reasonably robust to moderate violations of normality, given the inequality of sample sizes these analyses were repeated as Mann-Whitney *U* tests for skewed variables willingness to forgive, depression, and positive offender responses.

Individual differences predicting persistence (H2.2 – 2.3).

***Main correlations*.** Non-parametric bivariate correlations using Spearman's *rho* were used to test hypothesised associations between individual differences and persistence with REACH. Potential predictor variables included forgiveness-related trait variables (trait forgiveness, empathic concern, perspective taking) and personality traits (conscientiousness, agreeableness, neuroticism).

***Logistic regression analyses for hypothesised predictors*.** Direct and forward stepwise logistic regression analyses were conducted to obtain a more parsimonious explanation of the contribution of individual difference variables to variance in persistence with REACH among participants who commenced the program. Scores for persistence with REACH were recoded into two categories, according to whether or not the participant completed up to and including at least Module 5 of the six-module online REACH program. Participants who completed Module 5, whilst technically non-completers, were considered to have persisted sufficiently far to be considered finished, as Module 6 was largely focused on consolidation and generalisation of forgiveness skills. In addition, the number of people dropping out at each module stage was markedly attenuated at this point in the program, with only 3 participants dropping out once Module 5 had been started, compared to 5-6 for each of Modules 2 through 4 (see Table 18, p. 132 in Method section). Thus in these analyses persistence was coded either 0 = *not finished REACH* (*n* = 36) for participants who completed fewer than five modules, or 1 = *finished REACH* (*n* = 26), for those who completed five or more modules. This coding strategy also allowed analyses to proceed with subsamples more equivalent in size. Standardised residuals were inspected to detect outliers.

Direct logistic regression was performed to assess the overall predictive value of hypothesised predictor variables on the likelihood that participants who started REACH would persist to finish the course (i.e., complete five or six of the REACH modules). Trait forgiveness, perspective taking, empathic concern, conscientiousness, agreeableness, and neuroticism were

thus all entered at Step 1. The analysis was performed again as a statistical (stepwise) logistic regression in order to obtain the most parsimonious model for predicting persistence with REACH. Forward stepwise statistical regression method was used, with inclusion criteria based on maximum likelihood-ratio statistic. All hypothesised predictors were entered as above, with criterion for inclusion of a variable set at .15 as recommended by Hosmer, Lemeshow and Sturdivant (2013) to ensure entry of variables with coefficients different from zero.

Exploratory analyses using baseline measures. Given the limited previous research into intervention dropout in forgiveness studies to generate hypotheses, exploratory analyses were conducted to investigate further possible predictors of persistence with REACH after commencing the program. Bivariate correlations using Spearman's *rho* were calculated to explore relationships between persistence with REACH and a range of measures taken at baseline: 1) demographic factors; 2) factors related to the offence such as severity, relationship closeness, willingness to forgive, and time since offence; 3) social-cognitive factors related to forgiveness; and 4) outcome variables at Time 1. Significant correlates with persistence from the exploratory analyses were entered, along with significantly correlated hypothesised variables, in a final forward stepwise logistic regression to assess for further improvements in the model predicting the likelihood of finishing the REACH program. The stepwise regression was conducted as described above. Potential predictor variables entered were hypothesised variables empathic concern, perspective taking, and conscientiousness; and exploratory variable willingness to forgive, decisional forgiveness, overall state forgiveness, condoning-related beliefs, spiritual beliefs promoting forgiveness, and empathic responses.

Early program behaviours predicting persistence (H2.4 – 2.5). To assess whether early program behaviour predicts subsequent persistence with REACH, analyses were conducted on participants who had completed Module 1. Bivariate correlations using Spearman's *rho* were used to estimate the strength of the relationship between words typed, actual time spent logged on, and estimated time spent on Module 1 and subsequent persistence with REACH.

Chi-square tests for independence were used to assess whether signing the contract in Module 1 was related to subsequent persistence with the REACH program. Persistence with REACH was coded as above for logistic regression. For signing the contract, three categories were coded: signed, not signed, or not yet signed the declaration of intent to forgive.

Overall. Effects sizes for *t*-tests were calculated using eta squared to indicate the magnitude of differences between groups. Cohen's (1988) effect size conventions were used to assess the strength of association, with effect sizes of η^2 = .01, .06, and .14 demonstrating small, moderate and large effect sizes, respectively. For correlations, the strength of the relationship between variables was indicated by the *rho* coefficient and was evaluated according to the guidelines suggested by Cohen (1988), with *rho* = .10 to .29 indicating a small effect, .30 to .49 = medium effect, and .50 to 1.0 = large effect size. Significance values were set at *p* = .05 unless stated otherwise, and all *p* values are two tailed.

Results

Preliminary Analyses

Data were prepared for analysis as reported for Study 1. Variables with non-normal distributions included positive offender responses and depression which demonstrated moderate positive skew (i.e., a higher frequency of low scores). A moderate negative skew was observed in scores for willingness to forgive. As non-parametric analyses were used in main analyses, no transformations of these skewed variables were undertaken.

Early Attrition Analyses Examining REACH Non-Starter Versus Starter Participants, Preliminary Hypothesis 2.1

Independent samples *t*-tests compared participants who did not start REACH (*n* = 17) with those who started REACH by entering Module 1 (*n* = 62) on the hypothesised variables (trait forgiveness, willingness to forgive and conscientiousness) and in an exploratory way on the remaining potential predictor variables. Results for both groups are shown in Appendix I.

Differences in the expected directions for trait forgiveness (*p* = .102) and conscientiousness (*p* = .439) were non-significant. A near significant difference was observed for willingness to forgive, with people who commenced REACH (*M* = 7.79, *SD* = 2.76) tending to indicate more willingness to forgive than those who did not commence the program (*M* = 6.29, *SD* = 3.31), *t* = -1.89, *p* = .062, 95% CI [-3.07, 0.08], small to medium effect size of $\eta^2 = .04$. Results for exploratory *t*-tests showed no significant differences between groups, $t(77) < 1.49$, $p > .158$ on remaining variables.

Non-parametric analyses (Mann Whitney *U*) were conducted for skewed variables as above. Results were similar to *t*-tests, with only willingness to forgive showing a non-significant tendency to differ between groups, *U* = 379.50, *z* = -1.82, *p* = .069, *r* = 0.20 (small effect size).

Individual Differences Predicting Persistence with REACH, Hypotheses 2.2 – 2.3

Non-parametric bivariate correlations. Bivariate correlations between persistence with REACH, forgiveness-related trait variables (trait forgiveness, empathic concern, perspective taking) and personality traits (conscientiousness, agreeableness, neuroticism) are shown in Table 19, along with means and standard deviations. As expected, correlations between persistence scores and empathic concern (*rho* = .29), perspective taking (*rho* = .39) and conscientiousness (*rho* = .30) were significant with small to medium effect sizes. The relationships between persistence and the remaining dispositional variables did not reach significance, *rho* < .22.

Table 19

Correlation Matrix Showing Inter-Relationships Among Trait Variables and Persistence with Online REACH

Variable	*M (SD)*	2	3	4	5	6	7
1. Persistence	3.40 (2.35)[a]	.21	.29*	.39**	.08	.30*	-.09
2. Trait forgiveness	32.11 (6.86)	-	.35**	.48**	.29*	.08	-.46**
3. Empathic concern	4.22 (0.58)		-	.64**	.57**	.13	-.12
4. Perspective taking	3.81 (0.65)			-	.45**	.17	-.21
5. Agreeableness	4.30 (0.56)				-	.09	-.09
6. Conscientiousness	3.74 (0.77)					-	-.20
7. Neuroticism	3.22 (0.85)						-

Note. N = 62. Values represent Spearman Rank Order correlation coefficients. Effect sizes: *rho* = .10 to .29 (small correlation), *rho* = .30 to .49 (medium correlation), *rho* = .50 to 1.0 (large correlation) (Cohen, 1988).

[a] . Median value for Persistence with REACH was 3.25

**. $p < .01$ (2-tailed).*. $p < .05$ (2-tailed)

Logistic regression analyses. Direct and forward stepwise logistic regression analyses examining the most parsimonious set of variables predicting persistence with REACH (among participants who commenced the program) were conducted comparing non-finishers (completed fewer than five modules) and finishers (i.e., completed five or more modules). Outliers were detected by inspecting standardised residuals. Only one case had a standardised residual score of z > 2.5, indicating that the model incorrectly predicted the case would belong to the "finished REACH" category, but this was not corrected given the overall fit of the model. Correlations amongst predictors (*rho* = .08 to .64) and between predictors and the dichotomous coding of the persistence with REACH variable (*rho* = -.06 to .40) indicated that there was no violation of the assumption of absence of multicollinearity. The Hosmer-Lemeshow Goodness of Fit test indicated that all models reported were supported ($p > .05$). The sample used, $n = 62$, is small given the number of predictors used; therefore analyses were interpreted with caution and size of effects was examined along with significance level.

Direct logistic regression. Table 20 displays the direct logistic regression performed to assess the predictive value of trait forgiveness, trait empathy (both perspective taking and empathic concern), and the personality traits of conscientiousness, agreeableness and neuroticism on the likelihood that participants who started REACH would persist to finish the course. The full model containing all predictors was statistically significant, χ^2 (6, $N = 62$) = 16.14, $p = .013$, indicating that the model was able to distinguish between participants who finished or did not finish the REACH program. The model as a whole explained between 22.9% (Cox and Snell R^2) and 30.8% (Nagelkerke R^2) of the variance in persistence and correctly classified 75.8% of cases. Of the participants who did not finish REACH, 86.1% were correctly classified by the model, whilst of those who did complete REACH Modules 5 or 6, 61.5% were correctly classified by the model. As shown in Table 20, none of the independent variables made a unique significant contribution to the model, suggesting that the variance of predictors may overlap. In

the final model, the strongest predictor of persistence with REACH was perspective taking, recording an odds ratio of 2.76, 95% CI [0.76, 10.08].

Table 20

Direct Logistic Regression Predicting Likelihood of Completing Online REACH

	B	*S.E*	Wald	*df*	*p*	Odds Ratio Exp(B)	95% C.I. for Odds Ratio	
							Lower	Upper
Trait forgiveness	.07	.06	1.53	1	.216	1.07	.96	1.20
Empathic concern	.68	.81	.71	1	.400	1.97	.40	9.64
Perspective taking	1.02	.66	2.37	1	.123	2.76	.76	10.08
Conscientiousness	.80	.43	3.36	1	.067	2.22	.95	5.20
Agreeableness	-.23	.68	.11	1	.734	.79	.21	3.02
Neuroticism	.46	.44	1.05	1	.306	1.58	.66	3.77
Constant	-12.89	4.82	7.16	1	.007	.000		

Note. $N = 62$.

Stepwise logistic regression. Table 21 shows a forward statistical (stepwise) logistic regression to determine the most parsimonious predictive model of all hypothesised predictors, with variable inclusion criterion set at .15 (Hosmer & Lemeshow, 2013). The final model (Step 2), which included perspective taking and conscientiousness, showed a significant improvement in fit over the model at Step 1 (perspective taking only), Block χ^2 (2, $N = 62$) = 13.31, $p = .001$. The model explained between 19.3% (Cox and Snell R^2) and 26.0% (Nagelkerke R^2) of the variance in persistence and correctly classified 72.6% of cases. Of the participants who did not finish REACH, 86.1% were correctly classified by the model, whilst of those who did complete REACH Modules 5 or 6, 53.8% were correctly classified by the model.

Table 21

Stepwise Logistic Regression Predicting Likelihood of Completing Online REACH

	B	*S.E*	Wald	*df*	*p*	Odds Ratio Exp(B)	95% C.I. for Odds Ratio	
							Lower	Upper
Step 1								
Perspective taking	1.44	.49	8.57	1	.003	4.24	1.61	11.15
Constant	-5.89	1.94	9.23					
Step 2								
Perspective taking	1.39	.51	7.55	1	.006	4.03	1.49	10.89
Conscientiousness	.62	.39	2.61	1	.106	1.87	.87	3.98
Constant	-10.18	3.24	9.89					

Note. *N* = 62.

Exploratory Analyses Using Baseline Measures

Exploratory correlations. Table 22 shows Spearman's correlations between persistence with REACH and a range of measures taken at baseline. Significant positive correlations were observed between persistence with REACH and willingness to forgive (*rho* = .41), decisional forgiveness (.29) and overall state forgiveness (.34), indicating that participants with higher scores on these variables were likely to persist further with the REACH program than those with lower scores. A significant negative correlation was found between persistence with REACH and revenge motivation at Time 1 (*rho* = -.30), suggesting that people with high revenge motivation were less persistent with the program.

Of the social-cognitive factors related to forgiveness, only condoning-related beliefs (*rho* = -.32), spiritual beliefs promoting forgiveness (.27), and empathic responses (.28) were significantly associated with persistence with REACH.

Table 22

Spearman's Correlation Coefficients Showing Relationships Between Persistence with Online REACH and Other Possible Predictor Variables

Variable	*rho*	Variable	*rho*
Demographic, trait or situation variable			
Age in years	.15	Highest education	.09
Religiosity	.04	Time since transgression	.06
Extraversion	.00	Willingness to Forgive	.41**
Neuroticism	-.10	Relationship closeness	-.07
Openness	.14	Severity of offence	.03
Outcome variable (T1)			
Overall state forgiveness	.34**	State empathy	.23
Emotional forgiveness	.14	Rumination	-.07
Decisional forgiveness	.29*	Depression	-.15
Revenge motivation	-.30*	Stress	.01
Avoidance motivation	-.11	Anxiety	.02
Social-cognitive factors (T1)			
Positive offender responses	-.10	Unlikely to re-offend	.07
Condoning related beliefs	-.32*	Non-malicious intent	.11
Relationship value	.17	Humility	.14
Spiritual beliefs	.27*	Empathic responses	.28*
Social influence	-.20		

Note. N = 62. Values represent Spearman Rank Order correlation coefficients. Effect sizes: *rho* = .10 to .29 (small correlation), *rho* = .30 to .49 (medium correlation), *rho* = .50 to 1.0 (large correlation) (Cohen, 1988).

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Exploratory stepwise logistic regression. Significant correlates with persistence from the exploratory analyses were entered, along with significant hypothesised variables, in a final forward stepwise logistic regression to assess for further improvements in the model predicting the likelihood of finishing the REACH program. The final model (Step 3) included perspective taking and conscientiousness of the hypothesised variables, and willingness to forgive from the group of exploratory variables. The improvements in fit between Step 1 (willingness) and Step 2 (perspective taking and willingness) (Block χ^2 (2, N = 62) = 22.15, p <.0005), and between Step 2 and Step 3 (Block χ^2 (3, N = 62) = 25.63, p < .005) were significant, indicating that adding further correlates of persistence improved the model. The final model explained between 33.9% (Cox and Snell R^2) and 45.6% (Nagelkerke R^2) of the variance in persistence and correctly classified 77.4% of cases. Of the participants who did not finish REACH, 83.3% were correctly classified by the model, whilst of those who did complete REACH Modules 5 or 6, 69.2% were correctly classified by the model.

Table 23 shows statistics for variables included in the models at each step. In the final model, the strongest predictor of finishing the REACH program was the tendency to take the perspective of others, recording an odds ratio of 4.16, 95% CI [1.34, 12.95]. This suggests that for every additional point of self-reported perspective taking, participants were more than four times more likely to complete the REACH program. Conscientiousness was also included in the model, with an odds ratio of 2.19, 95%CI [0.94, 5.10], suggesting that people scoring an additional point in conscientiousness may be more than twice as likely to complete REACH. Willingness to forgive was also a significant unique predictor of persistence, with an odds ratio of 4.43, 95%CI [1.15, 2.18]. The final model suggests that assessing perspective taking, conscientiousness, and willingness to forgive at baseline may provide an adequate model for predicting who is more likely to drop out of the program early.

Approximate effect sizes were obtained for the relative contribution of Step 3 variables by converting odds ratios to Cohen's *d* equivalents (Borenstein, Hedges, Higgins, & Rothstein, 2009). Accordingly, the effect size for perspective taking (*d* = .78) was large, whilst those for conscientiousness (.43) and willingness to forgive (.25) were medium to small (Cohen, 1988).

Table 23

Logistic Regression Predicting Likelihood of Completing Online REACH

	B	*S.E*	Wald	*df*	*p*	Odds Ratio Exp(B)	95% C.I. for Odds Ratio	
							Lower	Upper
Step 1								
Willingness to forgive	.46	.16	8.20	1	.004	1.58	1.16	2.17
Constant	-4.12	1.43	8.30					
Step 2								
Perspective taking	1.49	.56	7.14	1	.008	4.43	1.49	13.21
Willingness to forgive	.43	.15	7.70	1	.006	1.54	1.13	2.09
Step 3								
Perspective taking	1.43	.58	6.08	1	.014	4.16	1.34	12.95
Conscientiousness	.78	.43	3.28	1	.070	2.19	.94	5.10
Willingness to forgive	.46	.16	7.91	1	.005	1.58	1.15	2.18
Constant	-12.50	3.33	14.11					

Note. *N* = 62.

Early Program Behaviour Analyses, Hypotheses 2.4 – 2.5

In the following analyses, participants who dropped out prior to completing Module 1 were excluded from the analyses. One participant did not respond to the time estimate item. Descriptive statistics for the potential predictor variables are shown in Table 24.

Table 24

Descriptive Statistics for Early Program Behaviour Variables Measured During Module 1 of Online REACH

	Actual time taken (minutes)	Estimated time taken (categories 1 - 7)	Words typed by participants
Minimum	17	25-30 minutes (1)	152
Maximum	490	More than 2 hours (7)	1327
Mean	89.88	-	551
Median	59.00	45 – 60 minutes (4)	521
SD	99.09	-	253
N	48	47	48

Estimated and actual time taken to complete Module 1. Table 25 shows Spearman's correlations between time spent on Module 1 and subsequent persistence with REACH. There was a significant positive correlation between the actual time taken on Module 1 and subsequent persistence with REACH, *rho* = .29 (*n* = 48), a small effect indicating that participants who spent more time on the first module persisted further with the REACH course. A somewhat contradictory finding was the non-significant correlation between self-reported time spent on Module 1 and persistence, *rho* = .07 (*n* = 47).

Table 25

Correlation Matrix Showing Inter-Relationships Among Module 1 Factors and Persistence with Online REACH

Variable	*N*	2	3	4
1. Persistence with REACH	48	.29*	.07	.21
2. Actual time taken (Module 1)	48	-	.61**	.53**
3. Estimated time taken (Module 1)	47		-	.54**
4. Words typed by participants (Module 1)	48			-

Note. Values represent Spearman Rank Order correlation coefficients. Effect sizes: *rho* = .10 to .29 (small correlation), *rho* = .30 to .49 (medium correlation), *rho* = .50 to 1.0 (large correlation) (Cohen, 1988).

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Words typed by participants in Module 1. Also shown in Table 25, the correlation between words typed in Module 1 by participants and subsequent persistence with the REACH program, *rho* = .21, was non-significant with a small effect size. Large positive correlations between the number of words typed and estimated and actual time taken to complete Module 1 are as expected for these constructs.

Declaration of intent to forgive. Table 26 shows results from Chi-square tests for independence used to assess whether signing the contract in Module 1 was related to subsequent persistence with the REACH program. Persistence with REACH was coded as above for logistic regression, 0 = *not finished* and 1 = *finished REACH*. For signing the contract, three categories were coded: signed, not signed, or not yet signed the declaration of intent to forgive. Again, participants who did not complete Module 1 were excluded from this analysis, and there were two cases who did not respond to the contract signing item.

An initial Chi-square test for independence indicated no significant association between signing the contract and completing the program, χ^2 (2, n = 47) = 2.19, p = .335, Cramer's V = .22 (small to medium effect size). However, in this test two cells violated the minimum expected cell frequency assumption for Chi-square tests. The analysis was repeated after recoding the

contract signing variable into two categories: “yes” (signed contract) and “no” (not signed or not yet signed). The 2 x 2 Chi-square test for independence (with Yate’s Continuity Correction) was also non-significant, χ^2 (1, n = 47) < .0005, p = 1.000, *phi* = .03 (small effect size). These results suggest that participants’ behaviour related to signing the contract in Module 1 was not related to subsequent persistence with the REACH program.

Table 26

Chi-Square Tests for Independence Calculated to Compare Participants Who Signed or Delayed Signing on Persistence with REACH

Variable	Frequency		χ^2	n	p
	Did not complete REACH (n=22)	Finished 5-6 modules of REACH (n=25)			
Signed contract in Module 1?			2.19	47	.335
Yes	13	14			
No	2	6			
Not Yet	7	5			
Signed contract in Module 1?			.05[a]	47	1.000
Yes	13	14			
No or Not Yet	9	11			

Note: Significance values (p) are two tailed;

[a] χ^2 reported for 2x2 tables is Yates Continuity Correction

Discussion

Study 2 investigated factors predicting engagement in, and persistence with, the online REACH for Forgiveness program. Persistence was operationalised as the number of modules attempted or completed prior to dropping out or completing post-course measures. Aims of the study were threefold: first, to investigate factors predicting attrition from the study prior to beginning online REACH; second, and primarily, to understand the dispositional and situation-related factors which predicted participants' persistence with online REACH once initiated; and third, to investigate whether early program behaviour predicts subsequent persistence with REACH. In this section, the main findings in relation to each of the aims will be summarised in brief, followed by a discussion of the significance of the findings in relation to previous research into attrition and treatment adherence and theories of forgiveness intervention. Similarly to Study 1, implications of the present study for theory and psychological practice will be acknowledged briefly, with a more comprehensive discussion deferred until the general discussion section. Discussion of the strengths and limitations of the current research will also be deferred until the general discussion.

The main findings of Study 2 were as follows: 1) no significant differences were observed between early dropout participants and those who began the REACH program, although group differences in willingness to forgive approached significance; 2) as hypothesised, for participants who started REACH, those scoring higher in trait empathy and conscientiousness were likely to persist further with the REACH program; 3) trait forgiveness, agreeableness, and neuroticism were not associated with persistence with REACH; 4) in exploratory analyses, higher scores for willingness to forgive, state forgiveness, spiritual beliefs, and empathic responses, and lower scores in revenge motivation and condoning-related beliefs, were also associated with persistence with REACH; 5) the most parsimonious model for predicting persistence based on individual differences and situational factors (i.e., combining hypothesised and exploratory

variables) included only trait perspective taking, conscientiousness, and willingness to forgive the specific offender identified in the program; 6) of participants who completed Module 1, those for whom the measured time from the start to the finish of the module was longer were subsequently more persistent with the REACH program; and 7) other early program behaviours such as subjective time spent, number of words typed, or signing a contract declaring intent to work towards forgiveness were not associated with a higher likelihood of finishing the program.

Predictors of Early Drop-Out

The hypothesis that participants who did not commence REACH after being given access to the program would report lower scores on trait forgiveness, willingness to forgive and conscientiousness than those who started the REACH program was not supported. Analyses suggested a near significant tendency for REACH starters to be more willing to forgive than those who dropped out early; however, the effect size was small. Exploratory analyses revealed non-significant differences between starters and non-starters on demographic, trait and situation variables, outcome measures at baseline, and social-cognitive factors related to forgiveness. In combination, these findings suggest that people who dropped out of the study at this stage did so for reasons unrelated to their dispositions or their experiences with the specific transgression situation described for the study. Other research has suggested that participants discontinue involvement in internet-based psychological intervention studies due to time constraints, technical problems, illness, lack of motivation, spontaneous improvement in condition, or burden of program (Christensen et al., 2009) and these factors may also have affected participants in the current sample.

In general, there is little previous research, especially in the forgiveness intervention literature, to provide comparisons with these findings. Broadly, the non-significant finding for conscientiousness is inconsistent with previous research linking personality with treatment adherence (Axelsson et al., 2011) and coping behaviours (Connor-Smith & Flaschbart, 2007). The

non-finding for trait forgiveness is inconsistent with expectations based on the well-established association between trait forgivingness and forgiveness of a specific offence (Fehr et al., 2010; Koutsos et al., 2008; Riek & Mania, 2012). Overall, the findings suggest that disposition, whilst it may predict forgiveness, may not be a useful predictor of initial engagement in a forgiveness intervention. However, it should be noted that analyses were conducted on a sample that had volunteered for a forgiveness study, so it is possible that differences do exist between current study participants and people who did not commence the overall study.

Pre-Program Predictors of Persistence With REACH

Hypotheses regarding associations between persistence with REACH and personality or forgiveness-related traits were partially supported. As expected, higher conscientiousness and trait empathy, including dimensions of empathic concern and perspective taking, were associated with greater persistence with the REACH program in correlational analyses, with small to medium effect sizes. Contrary to expectations, trait forgiveness, agreeableness, and neuroticism were not related to variation in participants' persistence with the REACH program.

Results for conscientiousness are consistent with a theorised relationship between personality and coping; this theory suggests that the self-discipline, achievement orientation and organisational skills associated with conscientious individuals make them more likely to favour engagement coping strategies and less likely to disengage (Carver & Connor-Smith, 2010). Previous meta-analytic results supporting this association between conscientiousness and coping styles include mean weighted positive correlations between conscientiousness and specific engagement coping responses such as problem-solving and cognitive restructuring, and negative correlations between conscientiousness and disengagement responses such as denial (Connor-Smith & Flaschbart, 2007). Persistence with the REACH program may demonstrate the capacity to actively engage in a problem-solving activity as well as the ability to self-regulate emotions which arise whilst undertaking cognitive restructuring. In addition, and unlike the above results

for dropout before starting REACH, these results for persistence by people who had initiated the program are consistent with previous research suggesting that people high in conscientiousness are more treatment compliant (Axelsson et al., 2011; Hill & Roberts, 2011), and more likely to report positive health behaviours (Raynor & Levine, 2009; Bogg & Roberts, 2004).

The current results suggesting that people higher in dispositional empathy (empathic concern and perspective tasking) persisted further with REACH than non-empathic individuals are consistent with the idea that people may persist with an intervention that aligns with their existing skills and preferences. Both the theoretical underpinnings and overt program contents of REACH emphasise the importance of empathising with the offender as part of the process of forgiveness (Worthington 1998a; Worthington, 2001; Worthington et al., 2012). People more dispositionally inclined to feel concern for others and able to understand their point of view may experience less resistance to completing exercises designed to help them understand the offender's experiences and motivations at the time of the transgression. They may also more readily understand the impact of their own past hurtful behaviour upon others. Hence, one explanation of the finding that people high in dispositional empathy persist further with the REACH program is that they are less likely to experience difficulties with the program which might cause them to disengage.

The non-significant finding for trait forgiveness was unexpected, and is in contrast to previous research suggesting people high in trait forgiveness are more likely to forgive an offender for a specific transgression (Fehr et al., 2010; Koutsos et al., 2008; Riek & Mania, 2012). As with the findings that trait forgiveness did not predict early dropout from the study, these results suggest that self-reported tendency to forgive does not predict engagement or persistence with an intervention designed to facilitate forgiveness of a specific transgression. Similarly, the non-significant findings for personality traits agreeableness and neuroticism are in contrast to previous research suggesting that agreeable people were more, and neurotic individuals less, likely to forgive an offender in relation to a specific transgression (Riek & Mania,

2012). Together these non-significant results indicate that individual difference factors which predict state forgiveness may be unrelated to predicting persistence with a forgiveness intervention.

Exploratory analyses revealed significant, small to moderate positive correlations between persistence and transgression-related willingness to forgive, overall state forgiveness, decisional forgiveness, spiritual beliefs and empathic responses, indicating that higher scores on measures of these factors were associated with persisting further with REACH. Persistence was negatively correlated with revenge motivations and condoning-related beliefs, both medium sized effects, indicating that participants reporting more revenge motivation or endorsing a view that forgiving an offender would be equivalent to condoning their behaviour were less persistent with REACH. These findings suggest that people open to the idea of forgiving, or already somewhat forgiving of their offender may be more inclined to persist with an intervention which is aligned with their views. Further, and considering that trait forgivingness did not predict persistence in the current study, the findings are consistent with the idea that situational factors may be stronger predictors of state forgiveness than dispositional factors (Riek & Mania, 2012). Similarly, the findings also suggest that those low in forgiveness or unwilling to try to forgive their offender may be less inclined to persist. This is somewhat consistent with previous research suggesting that higher symptomology or distress at baseline may be associated with low adherence to internet-based interventions (Christensen et al., 2009), although it should be noted that relationships between persistence and other potential measures of baseline transgression-related distress (e.g., stress, depression, offense severity) were not observed in the present study.

Finally, stepwise logistic regression modelling suggested that the most parsimonious model for predicting individual persistence with the REACH program after commencement included baseline perspective taking, conscientiousness, and willingness to forgive, which together explain between 33.9% and 45.6% of the variance in persistence with REACH. Of these,

the most important unique predictor was perspective taking. Whilst conscientiousness was not a significant unique predictor, it demonstrated a larger effect size than willingness, due to a larger standard error for conscientiousness. Whilst these effects are modest, the implication is that people who report themselves as high in perspective taking may be more persistent with the online REACH intervention and that potential participants in online REACH should be encouraged to be open to the idea of forgiving and prepared to reflect on the perspective of their offender in order to complete the program.

Early Program Behaviours Predicting Later Persistence With REACH

The hypothesis that greater early program engagement by those who completed Module 1 would be associated with greater subsequent persistence with REACH was supported for actual time logged onto the program but not for the number of words typed or participants' estimates of time spent. Furthermore, the hypothesis that people who signed a declaration of their intent to forgive in Module 1 would be more likely to persist with the REACH program than people who did not sign the declaration was not supported.

Analyses revealed a significant correlation with small effect size between the actual time elapsed between starting and finishing Module 1 and subsequent persistence with the program. However, the finding for actual time spent on Module 1 was contradicted by the non-significant finding for estimated time spent, suggesting that inaccuracy estimating time spent may have confounded the association with persistence. However, given the modest effect size and proportion of error in both measures of time spent, for example variations in time estimates and inclusion of break times in the measure of actual time taken, these findings should not be over-interpreted. Routine inclusion of early program measures which may predict program persistence is recommended for future research investigating online forgiveness interventions.

The non-significant finding for Module 1 words typed was unexpected, given the positive finding for time spent and the assumption that effort in a program reflects commitment. The most likely explanation for this finding is that the wide variation in number of words typed, which ranged from 152 to 1327 words (*M* = 551, *SD* = 253), is associated not only with engagement in the program, but also a variety of individual differences including verbal expressiveness, literacy, preparedness to share private thoughts with researchers, and typing ability. Hence, this result suggests that the number of words typed during this first REACH module is not a useful indicator of later persistence with the program.

Similarly, the current results suggest that participants' behaviour related to signing the contract in Module 1 was not related to subsequent persistence with the REACH program and may have been influenced by factors other than their commitment to working towards forgiveness. For example, participants working on the module using a tablet or laptop computer may not have had easy access to printing facilities.

Implications of Study 2

The current results provide a more nuanced picture compared to overall attrition results reported in Study 1, which found that a range of variables were associated with overall attrition from the study between Time 1 and Time 2 (that is, people from both conditions who dropped out before starting the intervention, during the intervention or whilst on the waiting list). Study 1 findings suggested that study completers were more likely to be older, score higher in state empathy and emotional and decisional forgiveness, and were less motivated to take revenge upon the people who had hurt them than non-completers (all small to medium effect sizes). The differences between Study 1 attrition findings and Study 2 findings related to dropout at different stages of engagement in the online program (i.e., before starting, after starting and after completing the first module) demonstrate the importance of research into adherence and

dropout which focuses more specifically on the stage within the intervention when participants cease engagement.

Study 2 results suggesting greater engagement in and persistence with online REACH by people higher in perspective taking, conscientiousness, and willingness to forgive provides important information for consideration by future researchers or clinicians wishing to develop online forgiveness programs. For example, these results may assist in furthering our knowledge about which interventions are most suited to different people. Additionally, in Study 2, after consideration of individual differences and transgression related attitudes and responses, the most variation in persistence with REACH after commencement that could be explained was 34 to 46%. It is thus likely that factors intrinsic to the design and delivery mode of the forgiveness intervention are also able to explain some of the non-persistence with the program, as these factors may be most proximate to participants' experience during the program. Further, it is possible that the overall design of the current study, which invited participants to contribute to a multi-part forgiveness study, may have impacted upon motivation to complete the intervention. Whilst participants included in Study 2 all consented to being randomised to the experimental phase of the study (i.e., consented to participate in online REACH), some participants may have dropped out believing they had already made a contribution to the research. It is likely that, had research recruitment sought participants for an intervention only, the drop-out rate may have been lower. These implications for design and targeting of forgiveness interventions in future research and practical psychological applications will be discussed in the general discussion section.

Study 3: Effectiveness of Online REACH: Moderating Factors and Mechanisms of Change

Overview of Study 3

Results from Study 1 demonstrated that an online adaptation of the REACH for Forgiveness program was effective at promoting forgiveness related to a specific transgression for people who completed the course. Study 2 explored factors associated with commencing, and persisting with, online REACH. Equally important considerations when evaluating online REACH relate to factors which moderate effectiveness of the program, and those which may represent underlying mechanisms of change. An understanding of individual differences, situation factors, or within-program behaviours associated with greater effectiveness assists in identifying people for whom REACH may provide greatest benefits. Conversely, an understanding of factors associated with lower effectiveness may have implications for screening of prospective users, suggest improvements to program contents, or identify topics for future research. Accordingly, individual differences, situation-specific factors, and early program behaviours were examined as potential predictors of program effectiveness in Study 3.

More broadly, and as discussed in the literature review, forgiveness researchers continue to refine theoretical models of forgiveness processes and, by association, how best to promote forgiveness of a specific transgression. In Study 3, based on these models, potential mechanisms underlying the effects of REACH were evaluated, especially those related to empathic processes, and the relationship between REACH outcomes and other self-reported changes were explored.

Moderators of effectiveness. As mentioned previously, research has highlighted the role of offense severity in predicting effectiveness of forgiveness interventions (Fincham, Jackson, et al., 2005; Wade et al., 2014). Positive correlations between offense severity and effectiveness of

forgiveness interventions suggest that, as severe offences may be associated with less forgiveness, people with more severe offenses may have more room to improve. Alternatively, as such offenses may be harder to forgive (Fincham, Jackson, et al., 2005), then more severely affected people may benefit from the focused attention that a forgiveness intervention provides (Wade et al., 2014). In the current study, as well as self-reported offense severity, participants also provided ratings of the intensity of various hurt feelings associated with the transgression they had selected to work on during the REACH program. These hurt feelings ratings allow a more nuanced exploration of the relationship between self-reported severity of the transgression and forgiveness intervention effectiveness than in previous research using only one indicator of the severity of the transgression.

Other factors that have been associated with greater likelihood of forgiving an offender for a specific transgression (i.e., state forgiveness) may also moderate the effectiveness of a forgiveness promoting program. Whilst in Study 2 it was shown that factors predicting state forgiveness were largely ineffective at predicting persistence with online REACH, it is possible that people with higher dispositional forgiveness, agreeableness, or empathy may make greater gains in a program which is aligned with their values. For example, someone who values forgiveness and seeks the help of an intervention to resolve unforgiveness of a particular transgression may engage fully with program activities and thus achieve higher levels of forgiveness. Similarly, social-cognitive factors shown to facilitate or inhibit state forgiveness (Blatt & Wertheim, 2015) may also moderate responsiveness to a forgiveness intervention. For example, people who believe that their offender's intentions were non-malicious, or who had received apologies, may more readily develop forgiving thoughts and feelings towards the offender. Accordingly, individual differences and social-cognitive factors were examined as potential moderators of online REACH effectiveness.

Finally, duration of treatment is a well-established moderator of treatment effectiveness in the general psychotherapy literature (Howard et al., 1986) and in reviews of forgiveness

interventions (Lundahl et al., 2008; Wade et al., 2014; Worthington et al., 2000). Similarly, treatment adherence, including the amount of time spent on the program, may also be associated with program effectiveness in online therapies (Donkin et al., 2011). As identified in the previous chapter, adherence to online REACH might be operationalised in terms of several within-program behaviours, including time spent working on the REACH modules, number of words typed, and completion of a contract signing activity indicating commitment to forgiving. Hence, the current study will evaluate the extent to which within-program behaviours moderate program effectiveness.

Potential mechanisms underlying the effects of REACH. Building empathy for the offender is included in most forgiveness intervention models (Wade & Worthington, 2005) and is a core theoretical component in process models of forgiveness including REACH (Enright & Fitzgibbons, 2000; Worthington, 2001). Consistent with theory, dispositional empathy, both emotional empathy and the ability to understand the perspectives of others, has been strongly correlated with dispositional forgivingness (Brown, 2003; Wade and Worthington, 2003) and with state forgiveness (Riek & Mania, 2012), and affective empathy has been shown to mediate the effectiveness of forgiveness interventions (McCullough et al., 1997; Sandage & Worthington, 2010). In the current study the degree to which forgiveness changes over time are associated with changes in empathy were examined. Empathy promoting activities in REACH explicitly encourage both affective and cognitive empathy for the offender. Thus, they are expected to lead to changes in state empathy (i.e., affective empathy), but may also influence post intervention changes in social-cognitive factors which emphasise thoughts and feelings about the offender and the transgression, such as empathic responses, non-malicious intent, and beliefs regarding the offender's likelihood of reoffending.

The theory underpinning the REACH intervention, variously described as the pyramid model or the empathy-humility-commitment model (Worthington, 1998a; 1998b), also emphasises the importance of humility in facilitating forgiveness. Specifically, humility is

regarded by Worthington (1998b) as an important precipitate of the altruistic gesture of forgiving a transgressor. During REACH, participants are explicitly encouraged to reflect on their own previous hurtful behaviour and experiences of being forgiven (Worthington et al., 2012). Increases in humility from pre- to post-intervention may thus reflect participants' responses to this program activity and were examined as a potential mechanism of change underlying the effectiveness of online REACH at promoting forgiveness outcomes.

Another potential mechanism of action concerns the psychoeducational focus of REACH, which emphasises the long term detrimental effects of unforgiveness on the unforgiving person and explores various definitions of forgiveness by comparisons to alternative responses to interpersonal transgressions (e.g., forgetting, accepting excuses, minimising what happened). Forgiveness theorists argue that condoning or excusing an offence is distinct from forgiveness (Kaminer et al., 2000); however, offering forgiveness, especially to an unrepentant offender, may be perceived as allowing the offender to "get away with it", minimising the seriousness of the transgression, or excusing the offender's actions (Blatt & Wertheim, 2015). A pardoning or condoning rationale for a forgiveness intervention in marital therapy was found to be less acceptable than rationales based on personal growth, reconciliation, or spiritually based rationales (Butler, Dahlin, & Fife, 2002). Holding condoning-related beliefs about forgiveness has been shown to substantially inhibit state forgiveness (Blatt & Wertheim, 2015). One of the ways that the REACH program may operate is through reducing concerns that forgiving would mean excusing or condoning the hurtful actions of the offender, thereby enhancing the possibility of forgiveness.

Outcomes associated with change in forgiveness. Lastly, post-program improvements in forgiveness may be accompanied by changes in other variables associated with wellbeing. Stress and coping theories of forgiveness (Strelan & Covic, 2006; Worthington, 2006), which conceptualise forgiveness as a strategy for coping with the stress associated with a transgression and its emotional consequences, suggest that gains in forgiveness may be accompanied by

reductions in stress. Similarly, rumination about the offence would be expected to decline as forgiveness increases. Activities related to understanding the role of rumination and worry in maintaining unforgiveness are included in the final module of REACH, where participants are coached in ways to manage reminders of the transgression or overcome doubts about forgiveness (Worthington et al., 2012). Correlations between changes in stress, rumination, and forgiveness will also be examined in Study 3 as these may contribute to our understanding of the association between forgiveness and psychological wellbeing.

Aims and Hypotheses

The broad aim of Study 3 was to develop a more detailed understanding of the effects of online REACH among those who completed the course. Specifically, factors moderating effectiveness of online REACH in increasing forgiveness and reducing unforgiveness were investigated, as well as changes associated with forgiveness improvements which may represent underlying change mechanisms. In addition, theoretically associated outcomes such as stress and rumination were examined for their relationship to pre-post forgiveness changes. In Study 3 forgiveness was operationalised as overall state forgiveness and emotional forgiveness, and unforgiveness operationalised as avoidance motivation, as these measures showed changes from pre- to post-course when compared to a control group in Study 1.

To explore factors moderating forgiveness outcomes, baseline measures of individual differences and situation-specific factors and attitudes, as well as within-program behaviours, were correlated with changes in forgiveness-related outcome variables from baseline to post-course for all participants who completed online REACH. Based on previous research suggesting that people who experience more serious transgressions obtain greater benefits from forgiveness interventions (Wade et al., 2014), it was hypothesised (H3.1) that participants reporting higher levels of offense severity and hurt feelings intensity would report greater increases in state forgiveness from pre- to post-intervention than those reporting lower scores.

Dispositional predictors of state forgiveness were also expected to moderate forgiveness outcomes; thus, it was hypothesised (H3.2) that higher scores in trait forgiveness, trait empathy, and agreeableness would be associated with greater pre-post changes in forgiveness. Similarly, positive attributions regarding the offender and his or her intent have been shown to facilitate forgiveness (Blatt & Wertheim, 2015). Therefore, it was hypothesised (H3.3) that participants reporting greater levels of positive post-offender responses, valuing the relationship, perception the offender is unlikely to reoffend, and perceived non-malicious intent of the offender, would report greater pre-post increases in state forgiveness. Based on previous research indicating that program adherence may predict greater effectiveness, it was hypothesised (H3.4) that more adherent within-program behaviours (words typed, time spent, signing a declaration of intent to forgive) would be associated with greater improvements in forgiveness.

The second aim of Study 3 was to investigate evidence regarding possible mechanisms of action underlying the effects of the REACH program as assessed by changes from pre- to post-program. As described previously, the main mechanisms that were proposed were based on the theoretical underpinnings of REACH and relate to the development of empathy for the offender and enhancing the personal humility of the person working towards forgiveness. Previous research has focused on emotional empathy as a mediator of forgiveness intervention effectiveness (McCullough et al., 1997; Sandage & Worthington, 2010). In the current study, the contribution of both affective and cognitive empathy, social-cognitive factors involving attributions of the offender (non-malicious intent and beliefs regarding the offender's likelihood of reoffending) and perspective taking related to the specific transgression (empathic responses) were assessed. Based on the theoretical underpinnings of REACH, and program exercises which aim to facilitate empathy and humility as steps towards achieving forgiveness, it was hypothesised (H3.5) that increases in change scores for state empathy, belief in the offender's non-malicious intent and their unlikelihood of reoffending, empathic responses, and humility would be significantly associated with improvements in state forgiveness from pre- to post-

intervention. Where results supported these hypotheses, potential overlap in the influence of individual factors related to empathy and humility components of REACH on forgiveness outcomes were further explored using a series of simple mediation analyses. In addition, and given the psychoeducational focus of REACH which guides participants towards a theoretically endorsed definition of forgiveness, it was hypothesised (H3.6) that decreases in change scores on condoning-related beliefs would be significantly associated with improvements in state forgiveness. Finally, in consideration of theoretical conceptualisations of forgiveness as a strategy for coping with transgression-related stress, exploratory analyses also investigated psychological wellbeing related changes which may be associated with REACH effectiveness. Improvements in stress and rumination scores from baseline to post-intervention which are associated with improvements in forgiveness change scores may indicate support for stress-coping theories of forgiveness.

Method

Participants

The sample used in this study was drawn from Study 1. Participants for the current study included all those who completed the online REACH intervention and post-program measures (*n* = 36). These included participants originally allocated to both conditions in Study 1: those allocated to immediate treatment (IT; *n* = 23) who went on to complete REACH, and those allocated to waiting list control (delayed treatment; DT; *n* = 13) who took up the opportunity to complete REACH after a waiting period. Participants were mostly female (94.4%), Anglo-Australian (80.6%), and university educated (63.9%). The mean age of participants was 51.28 years (*SD* = 12.78).

Materials

The measures and online forgiveness intervention used in this study are the same as those described for Study 1 (from page 61). Key measures of program adherence developed for Study 2 were also used in Study 3. Measures of time spent, estimated time and words typed were expanded to apply to all REACH modules for the current study, as described below.

Social-cognitive factors related to forgiveness. See Study 2 (p. 129) for a full description of the Factors Related to Forgiveness Inventory (FRFI; Blatt & Wertheim, 2015). For the current study, all FRFI items were presented in two forms. In the pre-treatment survey (Time 1), items were presented in the past tense, as previously described, in order to evaluate the influence of social-cognitive factors on forgiveness since the transgression occurred. For the post-treatment survey administered at Time 2, all items were rewritten in the present tense in order to evaluate current attitudes and beliefs. For example “I have felt sorry for the person” became “I feel sorry for the person” (see Appendix B).

In addition, for Study 3 analyses, two items from the empathic responses subscale were used to represent state cognitive empathy in specific post-hoc exploratory mediation analyses. The items were: “I have been able to see the situation from the perspective of the person who hurt me” and “I have thought about the painful experiences that may have led them to do what they did”. Scores on the two items were moderately correlated, $r = .36$, $p = .029$, suggesting that the items measured related constructs.

Estimated and actual time taken to complete REACH Modules. At the end of each REACH module, participants were asked to estimate the time taken to complete the module (“How much time did you spend actively working through this module?”) on an ordinal scale from 1 = *less than 15 minutes* to 7 = *more than 2 hours*. The actual time taken (in minutes) to complete each module was obtained from the Qualtrics survey system, and is calculated as the time elapsed between starting and ending the module. Actual time taken is assumed to include time when some participants took breaks or faced interruptions. For actual time, scores for each of the six modules were also summed to give a total time taken in minutes for the entire REACH program. The median total time taken by participants to complete REACH was 5.4 hours. Correlations between participants’ estimated time and actual time taken to complete modules were *rho* = .50, .69, .55, .64, .38, and .66 for Modules 1 to 6 respectively, and .48 between the total estimated time and actual time.

Words typed by participants in REACH Modules. Each REACH module involves participants in a range of reflective exercises and questions requiring written responses. The full text of each participant’s responses to the modules was downloaded from the Qualtrics website and the words typed by participants were extracted and exported into a Word document, from which a word count was calculated. Module scores were summed to give an overall words typed in REACH score. In the current study, mean total words typed by participants was 3,652.00 (*SD* = 1,636.46), with a range from 644 to 7637. This is similar to word counts reported in recent self-

directed REACH workbook studies undertaken by Harper and colleagues (2014), *M* = 4,136 (*SD* = 2,649) and Greer and colleagues (2014), *M* = 3,471 (*SD* = 1,762).

Hurt feelings. During Module 2 of the REACH program (Worthington et al., 2012) participants assessed the intensity of nine kinds of hurt feelings in relation to the transgression situation on a scale from 0 = *no experience of the specified feeling* to 10 = *extremely intense experience*. The hurt feelings assessed were disappointment, rejection, abandonment, ridicule, humiliation, betrayal, deception, abuse and disconnection. Participants used a visual analogue scale (picture on screen as a slider tool) to indicate their rating of hurt feeling intensity out of 10. The slider was initially set at zero and showed a numeric score (with one decimal place) as the slide was moved along the scale. Hurt feelings were rated by participants during the psychoeducational phase of the intervention, before the first REACH steps exercises were undertaken in Module 3. Hence, they were regarded as baseline measures of hurt feelings associated with the specific offender and transgression being described.

Two brief scales were created from these items. Hurt related to loss of relationship included items rejection, abandonment and disconnection, whilst hurt related to abusive or unjust transgressions included items ridicule, humiliation, betrayal, deception and abuse. Disappointment was excluded, as it did not correlate meaningfully with items in either scale. Internal consistency for the hurt feelings related to loss items was adequate for a three-item scale, α = .63, with mean inter-item correlations (*r* = .36) and corrected Item-total correlations range (*r* = .39 - .50) indicating that items measure related constructs. Cronbach's alpha for the hurt related to abuse scale (α = .80) was good, with mean inter-item correlations (.44) and corrected item-total correlations range (.45 - .77) indicating strong relationship between items.

Procedure

The procedure for the current study was as described in Study 1 (p. 72).

Design and Analysis

Study design. Analyses were performed on the IT group and DT group combined. Baseline, or pre-course, scores were derived from two time points, depending on the original condition to which participants were allocated, as shown in Figure 4, below. For IT participants, all baseline measures were completed at Time 1, immediately before being invited to commence REACH. For DT participants, demographic and dispositional measures were completed at Time 1a (commencement of the study), whilst situation specific measures and pre-intervention scores for outcome measures were taken at Time 1b (i.e., immediately before beginning the REACH program). In this way, time between pre-test and post-test scores were similar for both groups. In addition, DT participants who wished to select a new transgression to work on during the intervention were able to do so, and completed a new set of situation specific and pre-course outcome measures related to the new transgression. For all participants, post-course measures were taken immediately following completion of the final module of online REACH, at Time 2.

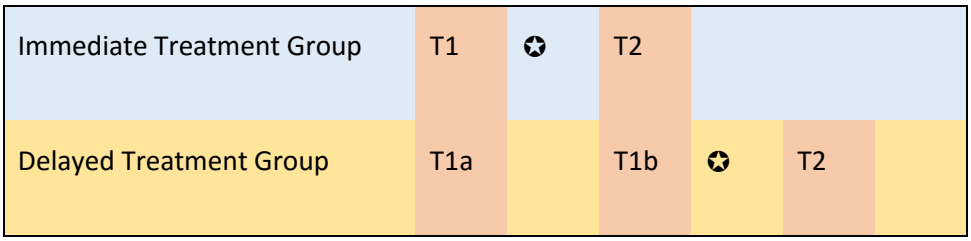

Figure 4. Schematic diagram of the research design for moderation analyses. ✪ = REACH Intervention; T1 = Pre-treatment; T1aT2 = Post-treatment.

Forgiveness-related outcome measures. Given the focus of Study 3 on understanding factors associated with effectiveness of REACH on forgiveness, only those forgiveness-related outcomes shown to be effective in Study 1 comparisons of IT versus DT changes from Time 1 to

Time 2 were included, namely overall state forgiveness, emotional forgiveness and avoidance motivation.

Preliminary analyses. In order to confirm pre- to post-treatment outcomes for the current sample, repeated measures *t*-tests comparing scores at Time 1 and Time 2 for all forgiveness-related outcome variables were conducted. Pearson's product-moment correlations were also conducted between all potential moderator variables and forgiveness-related outcome variables at baseline to assess construct validity and to assist in interpretation of moderation analyses results.

Moderation analyses (H3.1 – 3.4). Given the small sample size of participants completing the REACH program, moderator analyses could not be conducted using regression. As an alternative, standardised residual change scores were calculated for forgiveness-related outcome variables (overall state forgiveness, emotional forgiveness, and avoidance motivation). These residual change scores were computed by regressing post-intervention scores onto pre-intervention scores. The advantage of using standardised residual change scores is that they control for individual differences in pre-intervention scores (Raes, Williams & Hermans, 2009).

Pearson's product moment coefficients were used to assess the hypothesised relationship between potential moderator variables and increases in forgiveness of the offender following the REACH program. Correlations were calculated between standardised residual change scores for all forgiveness-related outcome measures (Time 1 to Time 2) and: 1) baseline scores for perceived severity of the transgression and ratings of intensity of hurt feelings reported during Module 2; 2) dispositional variables; 3) social-cognitive factors; and, 4) within-program behaviours. Significant correlations in the expected direction would indicate likely moderation of the effectiveness of the REACH program.

To examine the possibility that contract signing behaviour during Module 1 moderated effectiveness of REACH, a one way ANOVA was used to compare mean forgiveness change scores in each of three categories: signed the contract, didn't sign the contract, not yet signed

the contract. Analyses were repeated as independent samples *t*-tests after combining the not signed and not yet signed categories.

Exploratory moderation analyses. To assess for further moderators of effectiveness, bivariate correlations were calculated between participant age, religiosity, relationship closeness, and willingness to forgive and standardised residual change scores for forgiveness outcomes.

Mechanisms of change analyses (H3.5 – 3.6). To assess the suitability of hypothesised mechanism of change variables for the following analyses, repeated measures *t*-tests were calculated to compare pre- and post-intervention scores on those variables. Pre-post changes for other social-cognitive factors not expected to change as much over time were also compared to evaluate halo effects (Feeley, 2002). Standardised residual change scores were calculated for each of the hypothesised mediator variables (i.e., state empathy, non-malicious intent, unlikely to reoffend, empathic responses, humility and condoning-related beliefs). Preliminary Pearson's correlations were calculated among change scores for hypothesised mechanism of change variables to check for multicollinearity, which was not found.

Bivariate correlations were conducted between hypothesised variable change scores and forgiveness-related outcome change scores to evaluate possible mechanisms of change.

***Post-hoc exploratory simple mediation analyses*.** Regression analyses explored whether the effect of change in state cognitive empathy on the change in overall state forgiveness from pre- to post-intervention was mediated by changes in state affective empathy, non-malicious intent, or unlikelihood of reoffending. State cognitive empathy was operationalised by using two items from the empathic responses factor from the FRFI. Regression coefficients reported are unstandardised (*B* coefficients); however, they were equivalent to standardised coefficients due to the measures utilised being standardised residual change scores. Mediation was tested using the bootstrapping method with bias-corrected confidence estimates (Hayes, 2013; Preacher & Hayes, 2004). In these analyses, mediation is significant if the 95% bias corrected and

accelerated confidence intervals for the indirect effect using 1000 bootstrap resamples do not include zero (Hayes, 2013; Preacher & Hayes, 2004). Mediation analyses were repeated as described to investigate whether humility mediates the effect of affective empathy, or whether affective empathy mediates the effect of humility, on change in forgiveness from pre- to post-intervention. Potential mediation explored both pathways, as these theorised mechanisms of effectiveness are not considered sequential (Worthington, 1998b).

Other pre-post changes related to forgiveness change. Bivariate correlations between standardised residual change scores for stress and rumination and forgiveness-related outcome changes evaluated the relationship between forgiveness and other outcomes after completing REACH.

Overall. Effects size conventions in this study were the same as previously noted in Study 1 (p. 78) and Study 2 (p. 136). Due to the small sample size, correlations of moderate effect size that do not reach statistical significance were considered as providing modest support for hypotheses. Significance values were set at $p = .05$ unless stated otherwise, and all p values are two tailed.

Results

Preliminary Analyses

Data were prepared for analysis as reported for Study 1, as the sample used in the current study is the same as that used for ITT analyses for follow-up analyses. Variables with non-normal distributions included positive offender responses which demonstrated positive skew (i.e., a higher frequency of low scores), and willingness to forgive (moderate negative skew). Non-parametric analyses were used for moderation analyses involving these skewed variables, thus no transformations were undertaken.

Sample characteristics. The sample used in this study was drawn from Study 1. Participants included all participants (n = 36) who completed online REACH as well as baseline and post-treatment measures. Independent t-tests comparing IT and DT participants on standardised residual change scores for overall forgiveness, emotional forgiveness and avoidance (Time 1 to Time 2) found no significant differences, $t(34) < 1.04$, $p > .306$, therefore analyses proceeded for the combined sample.

Post-course outcomes. Table 27 shows results for repeated measures t-tests comparing Time 1 and Time 2 scores on forgiveness outcomes. All post-course outcomes were significant, $p < .001$, with very large effect sizes.

Table 27

Means (Standard Deviations) and Summary Statistics for Repeated-Measures T-Tests Comparing State Forgiveness-Related Outcomes at Time 1 and Time 2

	Time 1 *M (SD)*	*Time 2* *M (SD)*	*t*	*p*	95% CI	η^2
State forgiveness	49.53 (10.19)	60.17 (10.33)	-8.34	< .001	[-13.23, -8.05]	0.66
Emotional forgiveness	21.36 (6.34)	28.39 (7.70)	-7.22	< .001	[-9.00, -5.05]	0.60
Avoidance motivation	3.30 (1.03)	2.57 (1.12)	4.71	< .001	[0.41, 1.04]	0.38

Note. N = 36.

Baseline correlations. Correlations between self-reported offense severity, hurt feelings ratings and outcome variables measured at baseline are shown in Table 28. Moderate positive correlations were shown between offense severity and hurt feelings related to abuse (*r* = .41) and baseline avoidance motivation (.48). Table 29 shows correlations between all other potential moderators of effectiveness and outcome measures at baseline. Baseline correlations between social-cognitive factors and state forgiveness measures support construct validity (Blatt & Wertheim, 2015).

Table 28

Pearson's Correlations Between Baseline Scores for Outcome Measures, Severity, and Hurt Feelings Ratings

	Severity	State forgiveness	Emotional forgiveness	Avoidance
Severity	1.00	-.24	-.25	.48**
Hurt feelings (loss)	-.02	-.03	.05	.01
Hurt feelings (abuse)	.41*	-.14	-.11	.25

Note. N = 36. Effect sizes: *r* = .10 to .29 (small correlation), *r* = .30 to .49 (medium), *r* = .50 to 1.0 (large) (Cohen, 1988). Items included in hurt feelings related to loss were rejection, abandonment and disconnection. Items included in Hurt feelings related to abuse were ridicule, humiliation, betrayal, deception and abuse.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Table 29

Correlations Between Baseline Scores for Outcome Measures and Potential Moderator Variables

	State forgiveness	Emotional forgiveness	Avoidance
Dispositional variables			
Trait forgiveness	.52**	.35*	-.17
Empathic concern	.18	.08	-.06
Perspective taking	.31	.34*	-.08
Agreeableness	.29	.11	-.12
Social-cognitive factors at Time 1			
Positive offender responses	.01	.27	-.37*
Relationship value	.18	.53**	-.39*
Unlikely to reoffend	-.11	-.01	.01
Non-malicious intent	.21	.37*	-.41*
Spiritual beliefs	.58**	.40**	-.06
Social influence	-.23	-.39*	.28
Condoning-related beliefs	-.40*	-.19	.21
Humility	.25	.40*	-.38*
Empathic responses	.54**	.67**	-.41*
Exploratory variables			
Age	.25	.16	-.04
Relationship closeness	.09	.33	-.08
Willingness to forgive	.27	.32	-.12
Religiosity	.39*	.17	.13

Note. N = 36. Values represent Pearson's product moment correlation coefficients, except for Positive offender responses (positive skew) and Willingness (negative skew) for which Spearman's *rho* values are reported. All measures were taken at Time 1.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Moderators of Effectiveness, Hypotheses 3.1 – 3.4

For the following correlation analyses, standardised residual change scores for overall state forgiveness, emotional forgiveness, and avoidance motivation were used. For overall forgiveness and emotional forgiveness, the resultant change variables comprise scales in which lower scores indicate the least improvement in forgiveness (including a very small proportion of participants who recorded lower forgiveness scores at Time 2) and higher scores indicate the most improvement. For avoidance motivation, the reverse is true. That is, low change scores indicate the most reduction in avoidance motivation. Correlations among change scores for outcome variables are shown in Table 30. Correlations are in the expected directions. The relationships between overall state forgiveness and emotional forgiveness (r = .80) and avoidance motivation (-.74) are large, indicating likely overlapping of these constructs.

Table 30

Pearson's Correlations Among Standardised Residual Change Scores (Time 1 to Time 2) for Forgiveness Outcomes

	State forgiveness change	Emotional forgiveness change	Avoidance change[a]
State forgiveness change	-	.80**	-.74**
Emotional forgiveness change		-	-.57**
Avoidance change[a]			-

Note. N = 36.

[a] Low scores on Avoidance change reflects greater reductions in avoidance scores.

*. p < .05 (2-tailed), **. p < .01 (2-tailed).

Moderation by transgression severity and hurt feelings ratings (Hypothesis 3.1).

Bivariate correlations between self-reported severity of the transgression (Time 1) and change scores for forgiveness-related outcomes were non-significant, p > .255, as shown in Table 31.

Correlations conducted between hurt feelings reported at Module 2 and forgiveness-related residual change scores are also shown. Significant negative correlations with moderate effect sizes were observed between hurt feelings related to abuse and changes in overall forgiveness (*r* = -.44) and emotional forgiveness (-.37), and a moderate positive correlation with avoidance motivation change (.40), such that lower levels of improvement in forgiveness were associated with higher scores on abuse related hurt feelings. These correlations are in the opposite direction to expectations. Correlations between hurt feelings arising from losses associated with the relationship with the offender and forgiveness change scores were non-significant, $p > .163$.

Table 31

Means (Standard Deviations) and Pearson's Correlation Coefficients for Severity of the Transgression and Hurt Feelings Ratings with Standardised Residual Change Scores for Outcome Variables

	M (SD)	State forgiveness change	Emotional forgiveness change	Avoidance change[a]
Severity	7.75 (1.98)	-.19	-.15	.08
Hurt feelings (loss)	6.54 (2.67)	.01	.08	.24
Hurt feelings (abuse)	4.23 (2.76)	-.44**	-.37*	.40*

Note. *N* = 36. Column variables represent standardised residual change scores from Time 1 to Time 2. Row variables represent self-reported severity of the transgression and participant ratings of offence related hurt feelings measured during Module 2 of the *REACH for Forgiveness* program.

[a] Low Avoidance change scores reflect greater reductions in avoidance from Time 1 to Time 2.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Moderation by dispositional variables (Hypothesis 3.2). Correlations between dispositional measures and residual change scores for forgiveness-related outcomes are shown in Table 32. As predicted, there was a significant positive correlation with moderate effect size between trait empathic concern and emotional forgiveness change (*r* = .33), such that higher self-reported dispositional affective empathy towards others was associated with greater

improvements in emotional forgiveness after completing REACH. However, trait empathic concern did not significantly moderate effectiveness of the REACH program on overall forgiveness or avoidance; although correlations were in the expected directions and near significance, effect sizes were small. All other correlations were non-significant.

Table 32

Means (Standard Deviations) and Pearson's Correlations Between Trait Measures at Time 1 and Standardised Residual Change Scores for Forgiveness-Related Outcomes

	M (*SD*)	State forgiveness change	Emotional forgiveness change	Avoidance change[a]
Trait forgiveness	32.55 (7.35)	-.11	.09	.12
Empathic concern	4.38 (0.52)	.25	.33*	-.23
Perspective taking	3.95 (0.52)	.04	.04	.19
Agreeableness	4.42 (0.50)	.17	.07	-.12

Note. N = 36.

[a] Low Avoidance change scores reflect greater reductions in avoidance scores from Time 1 to Time 2

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Moderation by social-cognitive factors (Hypothesis 3.3). Correlations between forgiveness-related standardised residual change scores and social-cognitive factors related to forgiveness measured at baseline are shown in Table 33, with shaded results relating to hypothesised associations. Moderate correlations were observed between attributions of non-malicious intent and change in overall state forgiveness (*r* = .39) and avoidance (- .40), suggesting that those who believed, prior to undertaking the course, that their offender had more benign intentions, reported greater improvements in overall forgiveness and avoidance motivation after completing REACH. A significant negative correlation between belief that the offender was unlikely to re-offend and emotional forgiveness change (*r* = -.33), and near

significant associations with change in state forgiveness (-.28) and avoidance (.27) were found; these are not in expected directions and do not appear to be explained by ceiling effects. Correlations between relationship value and positive offender responses and forgiveness change scores were not significant, $r < .17$, $p > 329$.

Exploratory correlations between remaining social-cognitive factors and forgiveness change scores were largely non-significant, $p > .086$, except for a significant negative correlation between condoning-related beliefs and avoidance change ($r = -.34$) and near significant relationship with overall forgiveness (.32, $p = .053$).

Table 33

Means (Standard Deviations) and Correlations Between Social-Cognitive Factors Affecting Forgiveness Measured at Time 1 and Standardised Residual Change Scores for Outcome Variables

	M (SD)	State forgiveness change	Emotional forgiveness change	Avoidance change[a]
Positive offender responses	1.88 (1.06)	-.08	-.12	.17
Relationship value	3.17 (1.29)	.03	.04	.03
Unlikely to reoffend	2.01 (0.70)	-.28	-.33*	.27
Non-malicious intent	2.50 (1.05)	.39*	.23	-.40*
Condoning-related beliefs	2.39 (1.04)	.32	.19	-.34*
Spiritual beliefs	3.32 (1.44)	-.09	-.03	.01
Social influence	2.80 (1.09)	-.25	.01	.13
Humility	3.58 (0.97)	.23	.22	-.29
Empathic responses	3.11 (0.95)	.05	.08	-.06

Note. N = 36. Values represent Pearson's product moment correlation coefficients except for positive offender responses (positive skew) for which Spearman's *rho* values are reported. Row variables represent subscales from the Factors Related to Forgiveness Inventory (Blatt & Wertheim, 2015). Shaded area shows results for hypothesised correlations.

[a] Low Avoidance change scores reflect greater reductions in avoidance from Time 1 to Time 2.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Moderation by within-program behaviours (Hypothesis 3.4). Descriptive statistics for within-program measures actual time taken, time estimated by participants, and words typed by participants for REACH modules are shown in Table 34. Zero minimum scores for actual time and words typed for Modules 3 and 4 relate to one or more participants skipping these modules (two participants missed Module 3 and one participant missed Module 4). No participant missed more than one module, and each participant who missed a module went on to complete the course.

Table 34

Descriptive Statistics for Within-Program Behaviours in Modules 1-6 and Total REACH

	Actual time taken (minutes)		Estimated time taken (categories 1-7)		Words typed by participants	
	Range	*Median*	Range	*Median*	Range	*M (SD)*
Module 1	22 – 1378	67.00	2 – 7	4	218 - 1327	572 (231)
Module 2	10 – 177	36.50	1 – 6	3	141 - 821	409 (175)
Module 3[a]	0 – 550	54.50	2 – 6	3	0 - 1734	774 (475)
Module 4[a]	0 – 1195	36.50	2 – 5	3	0 - 1377	534 (314)
Module 5	7 – 1481	48.50	2 – 6	3	49 - 1104	567 (284)
Module 6	14 – 184	59.50	2 – 7	4	37 - 1946	796 (482)
All modules	73 - 3046	324.00 (5.4 hours)	-	-	644 - 7637	3652 (1636)

Note: *N* = 36. Estimated module time categories were: 1 = less than 15 minutes; 2 = 15-30 minutes; 3 = 30-45 minutes; 4 = 45-60 minutes; 5 = 1-1.5 hours; 6 = 1.5-2 hours; 7 = more than 2 hours.

[a]. Zero minimum times are shown as two participants did not complete Module 3 and another participant missed Module 4.

***Estimated and actual time taken to complete REACH modules*.** Correlations between participants' estimated time taken to complete all modules and forgiveness-related change scores were non-significant, *rho* = -0.17 to .18, $p > .295$. Correlations between estimates of time taken to complete each of the individual modules and change scores were also all non-

significant, $p > .207$. Similarly, Spearman's correlations between the total module actual completion times and forgiveness change scores were non-significant, *rho* = .04 to .10, $p > .548$. Correlations with actual time taken to complete Module 2 approached significance for overall forgiveness change (*rho* = -.30, $p = .071$) and avoidance motivation (*rho* = .31, $p = .062$), suggesting a tendency for participants spending longer on Module 2 to benefit less from the program. All other correlations between module completion times and forgiveness change scores were non-significant, $p > .175$. Taken together, these results suggest that time spent actively engaged in the REACH program activities did not influence the effectiveness of the course.

Words typed by participants. Correlations between total words typed and forgiveness-related change scores were non-significant, $p > .092$; however, a small correlation in the expected direction was observed between total words typed and emotional forgiveness ($r = .28$). Similarly, correlations between words typed in each individual module and change scores were generally non-significant with negligible to small effect sizes. However, small to moderate correlations between emotional forgiveness change and words typed in Modules 6 ($r = .36$, $p = .029$), Module 5 (.27), and Module 1 (.29), indicated a tendency for people who typed more words to make greater gains in emotional forgiveness.

Declaring the intention to forgive. Results for one way ANOVAs comparing mean change scores for participants who signed, did not sign or had not yet signed the contract are shown in Table 35; all were non-significant with small effect sizes. Independent samples *t*-tests for two contract-signing categories: signed contract and not signed (including not yet) the contract, were also non-significant, $p > .267$.

Table 35

Means (Standard Deviations) and Summary Statistics for One-Way Between-Subjects ANOVA Comparing Mean Change Scores for Participants Who Signed, Did Not Sign or Delayed Signing a Forgiveness Contract in Module 1 of Online REACH

	Yes *M (SD)*	*No* *M (SD)*	*Not Yet* *M(SD)*	*F*	*p*	η^2
State forgiveness	.01 (0.90)	-.18 (1.37)	.18 (0.84)	.23	.794	0.01
Emotional forgiveness	.01 (0.91)	-.09 (1.10)	.05 (1.21)	.04	.956	< 0.01
Avoidance motivation	-.16 (1.04)	.30 (1.06)	.13 (0.73)	.68	.515	0.04
N	21	8	7			

Note. *N* = 36.

Exploratory moderation analyses. In addition to exploratory analyses reported above for social-cognitive factors, correlations between forgiveness-related change scores and several exploratory factors are shown in Table 36. There was a significant negative correlation between religiosity and overall forgiveness change, suggesting that participants who described themselves as more religious at baseline reported lower forgiveness changes post-intervention. Results for remaining exploratory variables were non-significant, $p > .104$.

Table 36

Means (Standard Deviations) and Correlations Between Individual and Situation Factors Measured at Time 1 and Standardised Residual Change Scores for Outcome Variables (Time 1 to Time 2)

	M (SD)	State forgiveness change	Emotional forgiveness change	Avoidance change[a]
Relationship closeness	6.94 (2.84)	.17	.25	-.09
Willingness to forgive (*rho*)	8.33 (2.75)	.14	.25	-.12
Religiosity	2.31 (1.28)	-.35*	-.23	.17
Age in years	51.28 (12.78)	-.18	-.07	.11

Note. N = 36. Values represent Pearson's product moment correlation coefficients, except for Willingness to forgive (negative skew) for which Spearman's *rho* values are reported.

[a] Low Avoidance change scores reflect greater reductions in avoidance from Time 1 to Time 2.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Mechanisms Underlying Changes in Forgiveness, Hypotheses 3.5 – 3.6

Preliminary analyses. Statistics for repeated measures *t*-tests calculated to assess the suitability of hypothesised variables for analyses of possible mechanisms underlying the effects of REACH are shown in Table 37 (shaded area). Pre-post changes for other social-cognitive factors were also compared to facilitate evaluation of halo effects. Pre-post changes in hypothesised mechanism of change variables state empathy, non-malicious intent, unlikely to reoffend, humility, empathic responses, and condoning-related beliefs were all significant, $p <$ .035, therefore main analyses could proceed as planned.

Significant pre-post intervention changes were also observed for positive offender post-offence responses, $t = -2.10$, $p = .043$, but not relationship value, spiritual beliefs supporting forgiveness, and social influence not to forgive, $t < 1.66$, $p > .107$. The latter results are consistent with expectations regarding these constructs; that is, they would not be expected to change as a response to the REACH program content. Therefore, participants' post-intervention ratings of social-cognitive factors appeared reasonably robust to halo effects. Changes in positive offender responses may relate to later behaviour by the offender, rather than being attributable to effects of the intervention, therefore these were not investigated further.

For variables proposed for exploratory analyses regarding associated changes in psychological wellbeing, pre-post change in rumination was significant, $t = 5.44$, $p <.001$, $\eta^2 = .46$. However, the pre-post change for stress was not significant, $t = 1.67$, $p = .103$, $\eta^2 = 0.07$. Given the moderate effect size of this pre-post change, and that stress showed near significant pre-post changes in Study 1 when compared to a control group, both rumination and stress were included in exploratory analyses of changes associated with forgiveness changes following online REACH. For the following main and exploratory analyses, standardised residual change scores were calculated for prospective mediator variables as described above.

Table 37

Means (Standard Deviations) and Summary Statistics for Repeated-Measures T-Tests Comparing Prospective Mechanism of Change Variables at Time 1 and Time 2

	Time 1 *M (SD)*	*Time 2* *M (SD)*	*t*	*p*	95% CI	η^2
State empathy	2.79 (1.57)	3.45 (1.61)	-3.81	.001	[-1.00, -0.31]	0.29
Non-malicious intent	2.50 (1.05)	2.96 (1.18)	-3.35	.002	[-0.74, -0.18]	0.24
Unlikely to re-offend	2.01 (0.70)	2.41 (0.88)	-2.19	.035	[-0.79, -0.03]	0.12
Humility	3.58 (0.97)	4.01 (0.70)	-3.99	<.001	[-0.64, -0.21]	0.31
Empathic responses	3.11 (0.95)	3.67 (1.00)	-3.55	.001	[-0.87, -0.24]	0.26
Condoning-related beliefs	2.39 (1.04)	1.83 (0.92)	2.72	.010	[0.14, 0.99]	0.17
Relationship value	3.17 (1.29)	3.35 (1.28)	-0.88	.384	[-0.59, 0.23]	0.02
Spiritual beliefs	3.32 (1.44)	3.40 (1.45)	-0.42	.680	[-0.43, 0.29]	0.01
Social influence	2.80 (1.09)	2.45 (1.11)	1.66	.107	[-0.08, 0.76]	0.07
Positive offender responses	1.88 (1.06)	2.16 (1.03)	-2.10	.043	[-0.55, -0.01]	0.11
Stress	12.97 (4.47)	11.92 (3.74)	1.67	.103	[-0.22, 2.34]	0.07
Rumination	16.89 (5.83)	12.83 (6.45)	5.44	<.001	[2.54, 5.57]	0.46

Note. *N* = 36. Shaded area shows hypothesised mechanism of change variables.

Preliminary correlations. Correlations among change scores for hypothesised mechanism of change variables are shown in Table 38. All intercorrelations are moderate to strong, $r > .30$; however, there was no evidence of multicollinearity.

Table 38

Pearson's Correlations Among Standardised Residual Change Scores (Time 1 to Time 2) for Hypothesised Mechanism of Change Variables

	2.	3.	4.	5.	6.
1. State empathy change	.44**	.36*	.53**	.50**	-.53**
2. Non-malicious intent change	-	.49**	.60**	.49**	-.40*
3. Unlikely to reoffend change		-	.37*	.30	-.44**
4. Empathic responses change			-	.55**	-.59**
5. Humility change				-	-.47**
6. Condoning-related beliefs change					-

Note. $N = 36$.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Change in state empathy, associated social-cognitive variables, and humility as putative mechanisms of change in forgiveness (Hypothesis 3.5). Bivariate correlations between pre-post intervention changes scores in state empathy, associated social-cognitive variables, and humility, and forgiveness-related outcomes are shown in Table 39. As expected, putative mechanisms of change variables all correlated positively and significantly with changes in state forgiveness and emotional forgiveness, and negatively with changes in avoidance motivations.

Change in condoning-related beliefs as putative mechanism of change in forgiveness (Hypothesis 3.6). Also shown in Table 39 are large correlations between condoning-related belief change and change in state forgiveness ($r = -.62$), emotional forgiveness (-.59), and avoidance motivation (.51). These correlations were in expected directions.

Table 39

Pearson's Correlations Between Standardised Residual Change Scores (Time 1 to Time 2) for Forgiveness-Related Outcomes and State Empathy, Empathy Related Social-Cognitive Factors, and Condoning-related Beliefs

	State forgiveness change	Emotional forgiveness change	Avoidance change[a]
State empathy change	.70**	.64**	-.59**
Non-malicious intent change	.57**	.58**	-.45**
Unlikely to reoffend change	.47**	.49**	-.49**
Empathic responses change	.75**	.76**	-.52**
Humility change	.48**	.48**	-.43**
Condoning-related beliefs change	-.62**	-.59**	.51**

Note. $N = 36$.

[a] Low Avoidance change scores reflect greater reductions in avoidance from Time 1 to Time 2.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Post-hoc exploratory mediation analyses. A series of simple mediation models were tested using regression analyses to explore possible overlap in bivariate correlations between putative mechanisms of change and change scores in overall state forgiveness. All measures used in the following analyses represent standardised residual change scores from Time 1 to Time 2. All variables included in the following analyses were significantly intercorrelated, satisfying initial conditions for mediation analyses. Regression coefficients reported are unstandardised (*B* coefficients); however, they are equivalent to standardised coefficients due to the measures utilised being standardised residual change scores. All analyses were repeated using emotional forgiveness change and avoidance motivation change as outcome variables, with results following similar patterns.

Social-cognitive changes as mediators of effect of state cognitive empathy change on forgiveness. Regression analyses explored whether changes in either non-malicious intent or unlikelihood of reoffending mediated the effect of change in state cognitive empathy on the change in overall state forgiveness from pre- to post-intervention. Considering non-malicious intent first (Figure 5), results indicated that state cognitive empathy change was a significant predictor of change in non-malicious intent, $B = .49$, $p = .002$, and non-malicious intent change was a significant predictor of forgiveness change, $B = .28$, $p = .034$. Cognitive empathy change also had a significant total effect on overall state forgiveness change before the addition of a mediator, $B = .72$, $p < .001$. Results based on 1000 bootstrapped samples indicated that, with the addition of the mediator, the direct effect was reduced but still significant, $B = .58$, $SE = .13$, $p < .001$. Non-malicious intent change partially mediated the relationship between cognitive empathy change and forgiveness change, indirect effect = .14, 95% CI [03, .31]. Because zero was not in the 95% confidence interval, the indirect effect was significantly different from zero at $p < .05$ (two tailed).

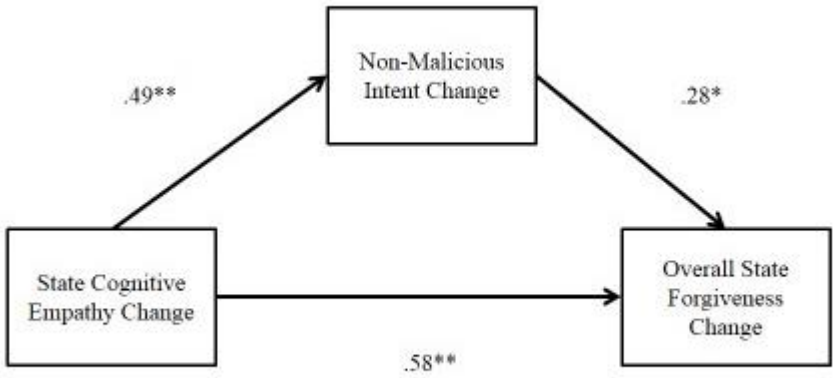

Figure 5. Mediation regression model showing the effects of state cognitive empathy change from pre- to post-REACH intervention on overall state forgiveness change.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Mediation by change in the perception that the offender was unlikely to reoffend was then analysed following the same procedure. Change in cognitive empathy was a significant predictor of increases in unlikelihood of reoffending, $B = .55$, $p < .001$; however, unlikelihood of reoffending did not predict forgiveness change, $B = .11$, $p = .459$, after accounting for cognitive empathy, therefore further mediation regression analyses were not completed.

Affective empathy change mediating the effect of state cognitive empathy change on forgiveness. Regression analysis investigated whether state affective empathy mediated the effect of state cognitive empathy on change in forgiveness from pre- to post-intervention. Results (see Figure 6) indicated that cognitive empathy change was a significant predictor of affective empathy change, $B = .58$, $p < .001$, and affective empathy change was a significant predictor of forgiveness change, $B = .42$, $p = .002$. Cognitive empathy change also had a significant total effect on forgiveness change before the addition of a mediator, $B = .72$, $p < .001$. Results based on 1000 bootstrapped samples indicated that, with the addition of the mediator, the direct effect was reduced but still significant, $B = .48$, $SE = .13$, $p = .001$. State affective empathy change partially mediated the effect of cognitive empathy change on forgiveness change, indirect effect = .24, 95% CI [.08, .47], indicating a significant indirect effect ($p < .05$).

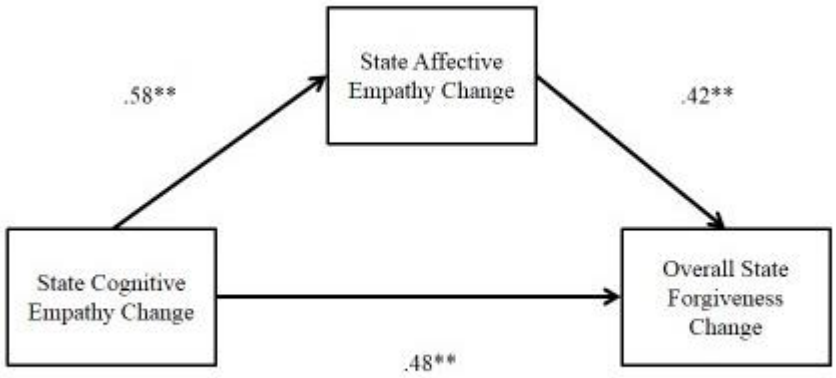

Figure 6. Mediation regression model showing the effects of state cognitive empathy change from pre- to post-REACH intervention on overall state forgiveness change.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Affective empathy and humility as predictors of forgiveness change. Regression analysis investigated whether humility change mediated the effect of affective empathy on change in forgiveness from pre- to post-intervention. Change in affective empathy was a significant predictor of increases in humility, *B* = .50, *p* = .002; however, humility did not predict forgiveness change, B = .17, *p* = .230, after accounting for affective empathy, therefore further mediation regression analyses were not completed.

Analyses were repeated to investigate whether mediation occurred in the alternative pathway, that is, whether affective empathy mediates the effect of humility on change in forgiveness. Results (see Figure 7) indicated that humility change was a significant predictor of affective empathy change, *B* = .50, *p* = .002, and empathy change was a significant predictor of forgiveness change, *B* = .61, *p* < .001. Humility change also had a significant total effect on forgiveness change before the addition of a mediator, *B* = .48, *p* = .003. Results based on 1000 bootstrapped samples indicated that, with the addition of the mediator, the direct effect was not significant, *B* = .17, *SE* = .14, *p* = .230. State affective empathy change fully mediated the effect of humility change on forgiveness change, indirect effect = .30, 95% CI [.13, .57], indicating a significant indirect effect (*p* < .05).

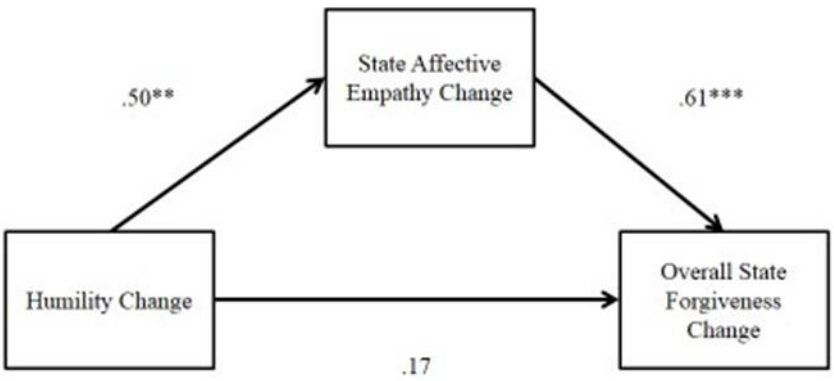

Figure 7. Mediation regression model showing the effects of humility change from pre- to post-REACH intervention on overall state forgiveness change.

*. *p* < .05 (2-tailed), **. *p* < .01 (2-tailed).

Other Pre-Post Changes Which May be Related to Forgiveness Change

The correlation between rumination change and stress change was non-significant, r = .30, p = .071, confirming that, whilst overlapping with a small effect size, stress and rumination changes represent distinct phenomena. Correlations between standardised residual change scores for stress, rumination, and forgiveness-related outcomes are shown in Table 40. For stress, as expected, there was a moderate relationship between reduction in stress and improvement in overall state forgiveness (r = -.30) and emotional forgiveness (-.42). Effects were more substantial for rumination: strong correlations were observed between rumination change and state forgiveness change (-.70), emotional forgiveness change (-.58) and avoidance change (.49), indicating that reductions in rumination about the offence were associated with post-course improvements in forgiveness.

Table 40

Pearson's Correlations Between Standardised Residual Change Scores (Time 1 to Time 2) for Forgiveness-Related Outcomes, Stress, and Rumination

	State forgiveness change	Emotional forgiveness change	Avoidance change[a]
Stress change	-.30	-.42*	.12
Rumination change	-.70**	-.58**	.49**

Note. N = 36.

[a] Low Avoidance change scores reflect greater reductions in avoidance from Time 1 to Time 2.

*. p < .05 (2-tailed), **. p < .01 (2-tailed).

Discussion

Broadly, the focus of Study 3 was on gaining a more detailed understanding of the effects of online REACH for those people who completed the modules. The current study had two aims. First, moderators of REACH effectiveness were evaluated by exploring whether individual differences, situation-specific factors, or within-program behaviours were associated with greater effectiveness of the REACH program at promoting forgiveness and reducing unforgiveness among those who finished the course. Second, potential mechanisms underlying the effects of REACH were explored by evaluating the contribution of REACH components associated with developing cognitive and affective empathy towards the offender. Relationships between REACH outcomes and other self-reported changes were also explored.

In relation to moderation of the effectiveness of REACH at promoting improvements in forgiveness pre- to post-intervention, the main findings of this study were: 1) participant rated transgression severity did not moderate the effectiveness of REACH; 2) contrary to expectations that initial hurt feelings would increase effectiveness, higher intensity ratings for feelings related to abuse were associated with lower effectiveness of REACH, whilst feelings related to relationship loss were not associated with changes in forgiveness; 3) as expected, trait affective empathy (empathic concern) was significantly associated with improvements in emotional forgiveness, with a near significant tendency for improvements in overall forgiveness and avoidance; 4) contrary to expectations, trait forgiveness, trait cognitive empathy (perspective taking) and agreeableness did not moderate effectiveness of REACH; 5) as expected, pre-intervention attributions of non-malicious intent by the offender were associated with greater improvements in forgiveness; 6) contrary to expectations, pre-intervention social-cognitive factors positive post-offender responses and valuing the relationship did not moderate effectiveness, whilst the expectation that an offender was unlikely to reoffend was associated with lower effectiveness; and, 7) contrary to expectations, the estimated and actual time spent

on REACH modules, words typed in modules, and signing a declaration of intent to forgive did not significantly moderate effectiveness. Findings in relation to exploratory analyses for moderation effects included: 8) higher condoning-related beliefs were associated with greater gains in forgiveness, whilst the remaining social-cognitive factors humility, empathic responses, spiritual beliefs and social influence did not moderate effectiveness of the program; 9) higher religiosity was associated with lower gains in forgiveness from pre- to post-intervention; and, 10) REACH effectiveness was not related to participant age, closeness of the relationship between participant and offender, or initial willingness to forgive the offender.

Main findings in relation to potential mechanisms underlying the effects of REACH from Time 1 to Time 2 were: 1) as predicted, change scores in state empathy, non-malicious intent, belief the offender is unlikely to reoffend, empathic responses, and humility were significantly associated with improvements in overall forgiveness, emotional forgiveness and avoidance motivation; 2) as predicted, reduction in condoning-related beliefs was significantly associated with improvements in all measures of state forgiveness. Exploratory mediation analyses found that: 3) change in attributions of non-malicious intent partially mediated the effect of cognitive empathy change on forgiveness change; 4) change in affective empathy partially mediated the effect of cognitive empathy change on forgiveness change; and 5) affective empathy change fully mediated the effect of humility change on forgiveness change. In addition, exploratory analyses for associations between change in forgiveness and other pre-post intervention changes showed: 6) improvements in emotional forgiveness were significantly associated with reductions in stress; and 7) reductions in rumination about the offence were significantly associated with gains in overall forgiveness and emotional forgiveness, and reductions in avoidance motivation.

Moderators of Online REACH Effectiveness

Offense severity and hurt feelings. The hypothesis that higher offense severity and hurt feelings intensity would be associated with greater increases in state forgiveness from pre- to

post-intervention was not supported. Participant rated severity of the offence did not significantly correlate with forgiveness change. Results for the hurt feelings associated with the transgression were unexpected. For combined hurt feelings related to abuse (ridicule, humiliation, betrayal, deception, and abuse) higher ratings of intensity were associated with lower effectiveness (i.e., negatively correlated with changes in overall forgiveness and emotional forgiveness, and positively correlated with changes in avoidance motivation with small to moderate effect sizes). In contrast, results for hurt feelings related to loss of relationship (rejection, abandonment, disconnection) were non-significant; indicating that the level of intensity of loss related hurt feelings did not moderate effectiveness of REACH.

The non-significant finding for severity is in contrast to previous research suggesting that forgiveness interventions may be more effective for people who have experienced severe transgressions (Wade et al., 2014), although in that meta-analysis severity ratings were applied retrospectively by researchers rather than being participant self-reports. Severe transgressions, being harder to forgive (Fincham, Jackson, et al., 2005), may require longer interventions than the median time spent by participants in the current study of 5.4 hours. However, Wade and colleagues (2014) found that multiple moderator analyses including treatment dosage still suggested a relationship between severity and forgiveness outcomes. Another explanation may relate to the delivery mode of the online self-help version of REACH as previous findings regarding severity and effectiveness relate to group or individual therapeutic forgiveness interventions. It is possible that people working on more severe or hurtful transgressions may benefit from the interaction with a trained therapist that is incorporated into group and individual approaches to forgiveness intervention. In another self-directed REACH study (Greer et al., 2014), the intervention was found to be effective at increasing forgiveness after controlling for participant rated hurtfulness of the offence; however, moderation effects were not reported. Similarly, in the current research, online REACH was found to be effective after controlling for severity of the offence (see Study 1), although higher intensity of hurt feelings

related to abuse were associated with lower effectiveness. Future research comparing the effectiveness of therapist moderated and self-directed versions of the REACH intervention may assist in understanding the moderating influence of transgression severity and hurtfulness (both participant rated and objectively rated) on treatment effectiveness. This understanding is important, as forgiveness interventions may benefit from being modelled on a stepped care approach, where self-directed treatments are recommended as a first line treatment option suitable for mild to moderate severity of the problem being treated (Mains & Scogin, 2003).

Trait forgiveness, trait empathy and agreeableness. The hypothesis that higher trait forgiveness, trait empathy, and agreeableness would be associated with greater pre-post changes in forgiveness was partially supported. Empathic concern was significantly and positively correlated with emotional forgiveness changes, with near significant correlations in expected directions for state forgiveness and avoidance, suggesting that people reporting higher trait empathic concern may also report greater improvements in forgiveness following online REACH. The hypothesis was not supported for trait forgiveness, perspective taking or agreeableness; correlations between these measures and forgiveness change scores were non-significant.

Results for empathic concern suggest that people who often feel tender, concerned or protective towards others may benefit more from the REACH program than people reporting lower levels of this trait. The current results are consistent with meta-analytic results linking empathic concern with state forgiveness (Fehr et al., 2010), and may suggest that people with higher levels of this trait were open to the idea of forgiving and receptive to the ideas and skills promoted in the program, and thus able to make greater improvements.

Non-significant findings for trait forgiveness, perspective taking and agreeableness are inconsistent with previous meta-analyses suggesting that people reporting higher levels of these traits are also more likely to forgive a specific offence (Fehr et al., 2010; Riek & Mania, 2012). However, baseline correlations in the current study were broadly consistent with these meta-analytic findings, for example, people reporting high scores in trait forgiveness also had high pre-

treatment scores in state forgiveness (*r* = .52). This suggests that ceiling effects may partially explain non-significant findings for moderation of effectiveness by trait forgiveness. That is, people already more forgiving than others at baseline may have had less room to improve as a result of the intervention.

Social-cognitive factors. The hypothesis that selected social-cognitive factors would moderate the effectiveness of REACH on forgiveness outcomes was supported for non-malicious intent, but not supported for positive post-offender responses, valuing the relationship, or perception the offender is unlikely to reoffend. Significant correlations in expected directions with changes in overall forgiveness and avoidance motivation, and a non-significant tendency for emotional forgiveness, indicated that people who believed their offender had not intended to harm them made greater post-intervention improvements in forgiveness. As baseline correlations between non-malicious intent and forgiveness measures were already in expected directions, this result suggests that an initial benign appraisal of the offender may lead to further gains following forgiveness promoting activities.

Non-significant results for relationship value and positive offender responses suggested that effectiveness of REACH was unrelated to the value placed by participants on their relationship with the offender or the perception that offenders had shown positive behaviours following the transgression, for example, by apologising or expressing guilt. A strong correlation between relationship value and emotional forgiveness (*r* = .53) at baseline suggests that this result may be explained by ceiling effects, that is, that people who highly valued the relationship were already more forgiving and had less room to improve.

Also unexpected were current findings that people who believed their offender was unlikely to reoffend reported smaller improvements in forgiveness than those who believed the transgression may be repeated. These results may be explained by considering that people who feared a recurrence of the transgression (i.e., reported lower scores on unlikeliness of reoffending), although no more or less forgiving than others in this sample at baseline, may be

more responsive to REACH content focused on forgiving as a means to resolving intrapersonal suffering associated with unforgiveness. Alternatively, program content focused on empathy may have helped participants revise their beliefs regarding the likelihood that the transgression would be repeated. Thus, people with low scores on unlikelihood of reoffending (i.e., believed their offender would offend again) may have gained more from the intervention than those with high scores. These explanations are discussed further in the following section regarding mechanisms of change underlying the effects of REACH.

Within-program measures. The hypothesis that more adherent within-program behaviours would be associated with greater improvements in forgiveness was not supported, except for a significant moderate correlation between words typed during Module 6 and emotional forgiveness change (r = .36). As near significant correlations were also observed for words typed in Modules 1 and 5, a cautious conclusion may be that people who demonstrate their engagement with program activities by typing more words could reap greater rewards from the program.

With regard to time spent working on the REACH modules, correlations were non-significant for both time calculated by the online system and time estimated by participants. Whilst both measures contain a degree of error, the consistency of the results suggests that time spent on REACH modules did not moderate the effectiveness of the course in improving forgiveness-related outcomes. Non-significant findings for time spent on intervention contradicts previous research suggesting a strong effect of duration on change in forgiveness (Wade et al., 2014). However, in the current study treatment dosage was determined by the individual participants (within a set intervention length of six modules) rather than the constraints of a scheduled group program or individual therapy hours. Previous studies of self-directed workbook adaptations of REACH (Greer et al., 2014; Harper et al., 2014) have not investigated the moderating effects of time. Given that online REACH has been shown to be effective for those who completed the course, these findings suggest that people may take the

time that they need in order to gain benefits of a self-directed intervention. For example, participants may spend more or less time on individual components in the program depending on their perceptions of the relevance of the activity to their problem, the interest or enjoyment derived from the activity, and the presence of external demands on their time or attention.

Largely non-significant findings for moderation of effectiveness by the number of words typed by participants may also indicate that self-directed forgiveness interventions are less sensitive to the treatment-dosage effects found in previous research (Wade et al., 2014). However, small to moderate correlations between words typed and effectiveness for emotional forgiveness suggest that this relationship might be explored further in future research. As with the results for time spent on the modules, the current findings for words typed may be an indicator that the flexibility of self-directed approaches allows for participants to use the materials as they see fit, and that the effectiveness of the intervention may not be reduced as a result. Understanding of the relationship between time, individual effort or engagement, and effectiveness of self-directed forgiveness treatments would be enhanced by studies that continue to evaluate the effects of words typed, and use improved measures of time spent actively working on the program. In online interventions, the latter might be measured more accurately by utilising the inherent capacities of online systems; for example, by suspending time measurement when key strokes or page turns have not been observed for a specified period.

The current findings suggest that signing a contract declaring the intent to work towards forgiveness does not moderate the effectiveness of the program. In combination with the finding in Study 2 that contract signing was not associated with subsequent persistence, this might suggest removal of the exercise in online formats, especially given the difficulty some online users may have in accessing a printer. However, this is not recommended as typed comments by participants in the current study who did sign the contract indicate that the declaration may be a meaningful and emotionally powerful program element for some people.

Exploratory analyses of other potential moderators. Exploratory analyses investigating possible moderation by other social-cognitive factors known to facilitate or impede state forgiveness provided additional findings of interest. These results suggested that people who equated forgiving with condoning the transgressive behaviour made moderately stronger gains in overall forgiveness (r = .32) and reductions in avoidance (r = -.34) than those with low scores on this factor. Negative correlations with forgiveness at baseline suggest that people who initially held this belief may have had more room to improve during the intervention. Psychoeducational content in REACH which specifically addresses condoning-related beliefs by distinguishing between forgiving and condoning, excusing or allowing the transgression to happen again, may partially explain this finding as people who are refraining from forgiving because of fears the offender will re-offend may learn more from the program. Change in condoning-related beliefs was also investigated as a possible mediator of forgiveness change in the current study and are discussed in the next section.

Non-significant findings for humility showed a tendency for people with higher baseline scores in humility to report greater post-intervention improvements in forgiveness. Results for empathic responses, spiritual beliefs and social influence were also non-significant. Comparison with strong baseline correlations suggests that people endorsing empathic responses towards the offender were already more forgiving, thus ceiling effects might have influenced results.

A significant negative correlation was observed between religiosity and change in overall forgiveness, suggesting that people who described themselves as very religious were less likely to benefit from doing the course. A possible explanation for this effect is that more religious people tended to have higher scores in baseline forgiveness (r = .39), so may have had less room for improvement. However, this explanation is only partial, as ceiling effects cannot explain non-significant results for emotional forgiveness and avoidance. Another consideration may be that the secularity of the version of REACH adapted for the current study was less appealing or relevant for people with strong religious beliefs. Worthington (2003) suggests that explicit

Christian content may make forgiveness interventions more relevant for people with religious beliefs; however, one study which compared the effects of secular and religiously-integrated group forgiveness programs found that the interventions were equally effective for Christian women (Rye & Pargament, 2002). Results suggest that effectiveness of the REACH program is unaffected by participant age, the closeness of the relationship between participant and offender, and initial willingness to forgive.

Putative Mechanisms of Action of Online REACH

State empathy and empathy related social-cognitive factors. The hypotheses that increases in scores on state empathy, non-malicious intent, belief the offender is unlikely to reoffend, empathic responses, and humility would be significantly associated with improvements in state forgiveness from pre- to post-intervention were supported. Significant correlations in expected directions with moderate to large effect sizes were observed between all predictors and overall state forgiveness, emotional forgiveness and avoidance motivations. In addition, changes in these predictor variables from pre- to post-intervention were all significant with large effect sizes. Together, these results are consistent the idea that, first, the empathy promoting activities within REACH have been effective at promoting increases in affective empathy for the offender and have influenced changes in empathic thoughts, as well as changes in attitudes to the target transgression and offender. Second, the results indicate that people who report greater increases in empathy and related factors also report greater improvements in forgiveness compared to those who reported lesser changes in empathy, suggesting that empathic processes may constitute mechanisms of change underlying the effectiveness of online REACH.

State affective empathy and measures of cognitive empathy. Significant findings for state affective empathy are consistent with earlier research findings showing that state affective empathy mediates the effectiveness of forgiveness interventions (McCullough et al., 1997;

Sandage & Worthington, 2010). Significantly, the current research also suggests that empathic responses towards the offender, assessed by a measure that represents both affective and cognitive empathy, may be a significant mechanism of change underlying the effectiveness of REACH. Further, post-hoc mediation analyses showing that affective empathy changes partially mediate the effect of cognitive empathy change on forgiveness suggest that specific REACH components encouraging cognitive empathy for the offender may have both direct and indirect influences on forgiveness changes.

Previous forgiveness intervention research has generally utilised a measure of affective empathy to indicate current empathy towards an identified offender. In a ground-breaking study which did include measures of both affective and cognitive empathy for a specific offender (McCullough et al., 1997), an explicitly empathy promoting forgiveness seminar was significantly more effective than a comparison psychoeducational forgiveness seminar at promoting forgiveness and affective empathy, but there were no differences between conditions for promoting cognitive empathy. Hence the current research, which appears to add to previous findings regarding the mechanisms of effectiveness of forgiveness interventions by changes in empathy, requires replication in studies including comparison conditions, or at least in larger pre-post studies which allow for evaluation of multi-mediator effects.

Further, there is a need for measures that clearly distinguish affective and cognitive empathy at the state level (i.e., concerning empathy for a specific offender); these may assist in clarifying the direct and indirect empathy processes underlying the role of empathy in interpersonal forgiveness processes. For example, the order of activities in process-based forgiveness interventions including REACH suggests it is assumed that obtaining an understanding of the perspective and context of an offender in relation to a specific transgression (cognitive empathy) leads to an increase in the warmth, compassion or concern for an offender (affective empathy) that is a crucial component of emotional forgiveness. However, it is likely that this process is interactive rather than linear; for example, one may need a degree

of affective empathy in order to undergo the effort required to consider the perspectives of a person who has behaved hurtfully. Further, the humility inducing exercises in REACH may also assist people in developing affective empathy; the role of humility relative to affective empathy is discussed below.

In combination, the current results for state empathic empathy and empathic responses are consistent with theoretical perspectives which describe empathy as a core process in developing forgiveness for a specific offender (Enright & Fitzgibbons, 2000; Worthington, 2001), and further validate the emphasis on empathic processes in the REACH intervention (Worthington et al., 2012). Improved measures and more powerful research design may assist in untangling these components of the forgiveness process.

Humility. The current research findings that substantial pre-post increases in humility were correlated with improvements in forgiveness are consistent with the empathy-humility-commitment model of forgiveness (Worthington, 1998b) and the inclusion of specific activities intended to promote humility in participants by encouraging them to reflect on their own capacity to hurt others (Worthington et al., 2012). Previous research has found evidence that people higher in humility were more likely to behave with generosity and kindness towards others (Exline & Hill, 2012) and that people who believed themselves capable of hurting others were more understanding and forgiving of others (Exline et al., 2008). The current results, suggesting that humility components of the REACH program were effective at increasing humility in some participants and that these gains were associated with forgiveness gains, support Worthington's (1998b) argument that humility facilitates forgiving an interpersonal transgressor.

Further, post-hoc mediation analyses found that the effect of humility on forgiveness change was fully mediated by increases in affective empathy, such that participants who reported greater increases in humility were also likely to report greater increases in affective empathy for the offender, and through the change in empathy, likely to report greater increases in overall state forgiveness. Whilst not indicating directional effects, this finding suggests that

the humility inducing activities, occurring after empathy exercises in the REACH intervention, may induce a further dimension of empathy for the offender, one that relates to shared, flawed humanity of offender and forgiver, including the capacity to hurt others and desire some form of absolution.

Sequential activities that directly or indirectly develop affective empathy are consistent with Worthington's (1998b) theoretical perspective that developing compassionate empathy may take time. Within the Pyramid Model (1998b), the role of humility is posited as facilitating forgiveness as an altruistic gift to the offender, borne out of the recognition that the forgiver has longed for, and been granted, forgiveness in the past. This theoretical relationship could be further tested in future studies by including a measure of the extent to which people who forgive do so for altruistic reasons (i.e., to relieve the suffering of the unforgiven transgressor) or for other reasons such as restoring the relationship or reducing their own unforgiveness related suffering.

Unlikelihood of reoffending and non-malicious intent. Significant correlations between pre-post improvements on all forgiveness measures and increases in offender non-malicious intent and belief that the offender is unlikely to reoffend, suggest that these factors may represent mechanisms underlying the effectiveness of the online REACH intervention.

Results for increases in the expectation that the offender was unlikely to reoffend are consistent with previous research suggesting that higher scores on this factor were associated with greater forgiveness (Blatt & Wertheim, 2015; Koutsos et al., 2008). One explanation for this finding is that people who consider the transgression from the offender's point of view may be more likely to see the transgression as a singular event rather than one that might occur repeatedly; however, post-hoc mediation analyses did not support a model where expectations of reoffending mediated the effect of cognitive empathy change on forgiveness.

Although increases in the expectation that the offender was unlikely to reoffend were associated with REACH effectiveness, it is not recommended that forgiveness interventions

directly encourage changing this expectation. Whilst in many cases transgressive behaviour occurs in the context of specific mitigating circumstances, encouraging people to believe that an offender is unlikely to reoffend would be inappropriate in situations or relationships where an offender represents an ongoing danger, such as family violence, systematic bullying, or abuse. Indeed, instructions in the current study explicitly advised participants to avoid using situations involving ongoing or severe abuse as the target transgression, and described reconciliation with an offender as distinct from forgiveness. The current findings, indicating that people may have reduced expectations of the offender reoffending as a result of the REACH program, suggest that future research or practical applications of forgiveness interventions should contain even more explicit psychoeducation regarding the distinctions between forgiveness and reconciliation.

Current findings for non-malicious intent change are consistent with previous research suggesting that benign attributions regarding the offender are related to empathy (Paleari et al., 2003) and forgiveness (Hall & Fincham, 2006; Koutsos et al., 2008; Riek & Mania, 2012). Previous research demonstrating associations between attributions regarding the offender and state forgiveness have been largely cross-sectional (Koutsos et al., 2008; Riek & Mania, 2012); the current findings support a social-cognitive model of contextual factors that predict state forgiveness (Blatt & Wertheim, 2015) whilst showing that changes in these factors over time may also be longitudinally associated with changes in forgiveness. A likely explanation of the current results is that exercises encouraging people to reflect on the transgression situation from the offender's perspective allow attributions based on specific context and circumstances rather than the offender's character, thus increasing attributions of non-malicious intent. Supporting this explanation, post-hoc simple mediation analyses showed that the relationship between changes in state cognitive empathy and forgiveness may be partly mediated by increases in the perception that the offender's intent was non-malicious. Taken together with results showing that more benign attributions of offender intent was associated with more pre-post improvement in forgiveness, the current results suggest that increases in positive attributions of

the offender's intent may be one specific mechanism by which empathy-based activities in REACH might help people reach forgiveness.

Condoning-related beliefs. The hypothesis that decreases in scores on condoning-related beliefs would be significantly associated with improvements in state forgiveness was supported. Large significant correlations in expected directions were observed between pre-post changes in condoning-related beliefs and overall state forgiveness, emotional forgiveness and avoidance motivations. These results suggest that people who reduced or overcame their condoning-related beliefs from pre- to post-intervention also reported substantial gains in forgiveness after completing online REACH.

In combination with the finding that condoning-related beliefs moderated the effectiveness of REACH, the current results are consistent with previous research identifying condoning-related beliefs as a significant inhibitor of state forgiveness (Blatt & Wertheim, 2015) and provides evidence supporting the importance of the psychoeducational component of REACH, which guides participants towards a theoretically endorsed definition of forgiveness. As such, the current findings are also consistent with earlier research linking effectiveness of group forgiveness interventions with the amount of time spent on forgiveness definition components (Wade et al., 2005). As proposed above, a likely explanation for this relationship may be that participants with high condoning-related beliefs were especially responsive to psychoeducational material in REACH. The current results suggest that change in this particular forgiveness inhibiting belief about forgiveness may be one mechanism of change underlying the effects of the REACH intervention, and could be explored in other therapeutic settings preparatory to working on forgiveness of an interpersonal transgression.

Exploratory analyses for stress and rumination. Exploratory analyses found that changes in stress and rumination were also associated with REACH effectiveness. Pre-post change effect sizes were moderate for stress and large for rumination. Moderate correlations between pre-post changes in stress and both emotional forgiveness and overall state forgiveness

suggest that people who reported greater gains in forgiveness also noted reductions in stress levels. More substantially, pre-post reductions in rumination about the offence were strongly correlated with improvements in overall state forgiveness, emotional forgiveness and avoidance motivation.

These findings offer broad support to stress-coping theories of forgiveness (Strelan & Covic, 2006; Worthington, 2006), as they demonstrate that both specific stress-based responses to the transgression (i.e., rumination) and generalised distress (stress) may attenuate as forgiving responses increase. The findings for stress are consistent with prospective studies that have shown that state forgiveness negatively predicts subsequent psychological distress (Bono et al., 2008; Orcutt, 2006). In the current study, stress reduction was most strongly associated with increases in emotional forgiveness, supporting the argument of Worthington, Witvliet, and colleagues (2007) that it is emotional forgiveness that may have the most direct effect on health via reductions in stressful negative emotions. The findings for stress may be explained in terms of stress-coping models, which posit that forgiveness is a form of coping with stress (Strelan & Covic, 2006; Worthington, 2006); thus, the current findings may support a model where stress reduction is at least partially mediated by changes in forgiveness. However, the current correlational results do not indicate causality and need replication in research that is able to include testing of multi-mediator models.

The current finding that reductions in rumination correlated strongly with pre-post REACH forgiveness improvements may be explained by several factors; whilst none of these is the focus of the current research, they are briefly outlined here. First, the REACH intervention includes exercises that directly address rumination as an aspect of unforgiveness that contributes to the suffering of the person hurt by the transgression and the difficulty of holding onto forgiveness. It is possible that the current results indicate reductions in rumination as another possible mechanism of change underlying the effects of the REACH intervention. Second, and similar to results reported earlier in relation to affective empathy, the findings for

rumination may be explained by overlap between the measures of rumination about the offence and overall forgiveness. That is, forgiveness is at least partly characterised by attenuation of distressing cognitions about the hurtful offence. Finally, the correlations between rumination change scores and forgiveness change may reflect an alternative sequence, that is, people who have reached a state of forgiveness are likely to ruminate less because of the associated reduction in negative thoughts and feelings regarding the transgression and offender.

Conclusions in Relation to Study 3

In conclusion, Study 3 presents a considerably more nuanced picture of the effectiveness of online REACH at promoting forgiveness among those who completed the program. Expectations that participant adherence or duration of engagement in the program would moderate effectiveness were not met, suggesting that online, self-directed interventions may allow participants to set their own pace in contrast to group-based forgiveness interventions. Similarly, results suggesting participant rated offense severity does not moderate effectiveness, and that particular types of offence hurtfulness may have inhibited program effectiveness are in contrast to previous findings based on research into group-based or individual forgiveness interventions and suggest that further research investigating self-directed modes of forgiveness intervention delivery is needed.

In relation to potential mechanisms of change underlying the effectiveness of REACH at promoting forgiveness, the current research provided support for several theoretical frameworks addressing different aspects of forgiveness processes. First, the current results highlight the significant contribution of a social-cognitive model of contextual factors as moderators, and possible mechanisms of change underlying the effectiveness of REACH. Previously identified as important facilitators or inhibitors of state forgiveness in cross-sectional studies (Blatt & Wertheim, 2015; Riek & Mania, 2012), the current research demonstrates that selected social-cognitive factors, notably those involving attributions of offender intent,

expectations regarding future offending, and beliefs about the meaning of forgiveness, may also predict individual responses to forgiveness interventions or interact with empathic processes over time to predict forgiveness longitudinally. Second, the psychoeducational focus of REACH was validated by findings of strong relationships between program effectiveness and reductions in the belief that forgiveness is equivalent to condoning or excusing an offence. Third, current findings also support stress-coping models of forgiveness by demonstrating that improvements in forgiveness are associated with reductions in generalised subjective stress and offense-related rumination.

Most fundamentally, relationships between REACH effectiveness and changes in state empathy, humility, and empathy related social-cognitive factors support the pyramid model of forgiveness (Worthington, 1998b) which describes empathy and humility as important and necessary elements of interpersonal forgiveness processes. These findings validate the inclusion of specific activities inducing empathy and humility in interventions attempting to relieve participants of the burdens of unforgiveness, and suggest some of the specific mechanisms by which such activities may lead to forgiveness. Theoretical implications and suggestions for future research are expanded upon in the next chapter.

General Discussion

This chapter discusses the three empirical studies which examined the effects of an online, self-directed adaptation of the REACH program in a community sample. Study 1 examined outcomes in individuals who had completed REACH at post intervention, compared to a waitlist control, and at three-month follow-up. Study 2 investigated the effects of individual differences in personality and forgiveness-related traits, situation specific social-cognitive factors, and early program behaviours on persistence in completing REACH modules. Study 3 explored pre-program and within-program factors which moderated forgiveness outcomes in REACH completers and examined evidence of mechanisms underlying REACH effects.

The aim of this chapter is to summarise findings across these studies. Further theoretical and practical implications of the current findings that have not been covered earlier will be discussed, emphasising the implications for online forgiveness interventions, the role of empathy and related factors in forgiveness, and a social-cognitive model of contextual factors that predict forgiveness. Finally, the strengths and limitations of the current research, as well as directions for further research, will be discussed.

Summary of Findings From Study 1

The main finding from the current research was that participation in an online adaptation of REACH was associated with improvements in measures of state forgiveness of a specific offender and a tendency to improve in subjective stress, a measure of generalised distress. In comparison to a waitlist control group, participants who had completed online REACH improved at post intervention on overall state forgiveness, emotional forgiveness, avoidance motivation, rumination, and state empathy, with a near significant reduction in stress.

Improvements in the IT group were evident after controlling for baseline group differences in severity of the offence, willingness to forgive, trait forgiveness and perspective taking. Contrary to predictions, participation in the program was not associated with changes in revenge motivation or decisional forgiveness. In contrast to previous research into forgiveness interventions and psychological wellbeing (Akhtar & Barlow, 2016; Wade et al., 2014), participation in online REACH was not associated with improvements in depressive symptoms.

At three-month follow-up, the combined sample of participants who completed online REACH had maintained post-course treatment gains in state forgiveness, emotional forgiveness, rumination, avoidance motivation, and stress; however, there was a tendency for post-course gains in state empathy for the offender to diminish in the months following the intervention. In addition, from baseline to follow-up those who completed online REACH reported a significant and large increase in trait forgiveness scores and a tendency for improvement in trait perspective taking, but these findings, along with the maintenance of treatment gains at follow-up, need to be confirmed by research that includes a control group.

Summary of Findings From Study 2

Study 2 reported findings of an exploration of factors contributing to substantial participant attrition between being given access to and completing online REACH. Findings from Study 2 suggested a non-significant tendency for people less willing to forgive the specified transgression to disengage from an online forgiveness intervention prior to commencement; however, no differences were observed between pre-commencement dropout participants and commencing participants on trait or demographic variables or baseline measures of forgiveness.

The main findings of Study 2 concerned factors predicting persistence with online REACH after commencing the program. Findings indicated that people higher in trait empathy and conscientiousness completed more modules, whilst trait forgiveness, agreeableness, and

neuroticism were not associated with persistence with REACH. Exploratory analyses showed that persistence was also associated with situation specific factors including pre-intervention state forgiveness, decisional forgiveness, revenge motivation, willingness to forgive, condoning-related beliefs, spiritual beliefs, and empathic responses. Finally, Study 2 findings also suggest that those who spend more time working on the first module of online REACH were subsequently more persistent with the program, but other early program behaviours such as words typed were not associated with a higher likelihood of finishing the program.

When current predictive factors were considered together, the most parsimonious model for predicting persistence with online REACH included trait perspective taking, conscientiousness, and a willingness to forgive the person who caused hurt or offence. This model explained 34 to 46% of the variation in persistence with online REACH after commencement. It is thus likely that other factors, including design of the online forgiveness intervention, may explain the large amount of non-persistence with the program, as these factors may be most proximate to participants' experience whilst engaging in the program.

Summary of Findings From Study 3

Findings regarding moderation of the effects of online REACH were largely unexpected. Severity of the transgression did not moderate REACH effectiveness; however, higher intensity ratings for feelings associated with an abusive transgression such as humiliation or deception were associated with lower effectiveness of REACH. Similarly, expectations that program adherent behaviours such as spending more time or typing more words would be associated with greater effectiveness were not substantiated. Whilst trait empathic concern was significantly associated with improvements in emotional forgiveness, other trait variables - dispositional forgiveness, perspective taking and agreeableness - did not moderate REACH effectiveness. In relation to social-cognitive factors, attributions of non-malicious intent by the

offender and believing forgiving would be condoning or excusing the offender were associated with greater improvements in forgiveness, but participants' expectation that an offender is unlikely to reoffend was associated with lower effectiveness. Remaining social-cognitive factors, along with participant age, closeness of the relationship between participant and offender, or initial willingness to forgive the offender did not moderate effectiveness of the program.

Study 3 also provided some evidence of mechanisms underlying the effects of online REACH. These included pre-post increases in state empathy, non-malicious intent, belief the offender is unlikely to reoffend, empathic responses, humility, and decreases in condoning-related beliefs, which were all significantly associated with improvements in overall forgiveness, emotional forgiveness and avoidance motivation. These findings must be interpreted cautiously: the current evidence does not indicate causal relationships between such changes, and an additional factor or factors may cause changes to both putative mechanisms and forgiveness. Post-hoc exploratory mediation analyses using selected pre-post changes found that attributions of non-malicious intent partially mediated the effect of cognitive empathy change on forgiveness change; affective empathy partially mediated the effect of cognitive empathy change on forgiveness change; and affective empathy change fully mediated the effect of humility change on forgiveness change.

Last, exploratory analyses for associations between change in forgiveness and other pre-post REACH changes showed that reductions in rumination about the offence were significantly associated with gains in overall forgiveness and emotional forgiveness, and reductions in avoidance motivation. Similarly, improvements in emotional forgiveness were significantly associated with reductions in stress. These and all other findings in Study 3 need to be confirmed by research with a control group.

Theoretical Implications

Findings from the current research provide support for the Pyramid Model of Forgiveness which underpins the REACH program (Worthington, 1998b). For example, the findings support the theory that affective empathy towards the offender and humility regarding one's own capacity to hurt others may be facilitating conditions for the development of state forgiveness. Further, the findings validate the inclusion of specific elements in REACH such as activities designed to induce understanding of the offender's perspective, activities inducing personal humility, and psycho-educational elements which guide users toward a theoretically endorsed definition of forgiveness (Worthington et al., 2012). The findings from the current research also provide modest support for stress-coping models of forgiveness which emphasise the role of forgiveness in enhancing health and wellbeing via associated reductions in negative emotions and stress (Strelan & Covic, 2006; Witvliet et al., 2015; Worthington, 2006).

Previous research has endorsed an association between the duration of treatment and effectiveness for general psychotherapy (Howard et al., 1986), online therapies (Donkin et al., 2011) and in forgiveness interventions delivered in group formats or individual therapy (Lundahl et al., 2008; Wade et al., 2014). However, in the current study, where time in treatment was determined by individual participants rather than by the constraints of a group or therapy appointment schedule, time was not related to effectiveness. This finding demonstrates the importance of distinguishing between duration constructs: 1) the *intended duration* of a treatment, that is, how long it might typically take to work through the contents of a program, and, 2) time spent by an individual program participant engaging with the content. As such, the intended duration of online REACH was roughly six hours, and might be expected to have similar effectiveness to a six hour group program. Further, as a self-directed individual program, the actual time spent engaging with program content varied from person to person, with no systematic impact on effectiveness. This highlights the opportunity provided by self-directed or

online interventions for participants to individually determine the amount of time spent on components of a program in order to gain the desired forgiveness benefits.

A range of empathy related findings in the current research support the central place of empathy related components in the REACH forgiveness program (Worthington, 1998b), which, in turn, reflects theoretical emphasis on empathy in forgiveness models (Enright & Fitzgibbons, 2000; Worthington, 1998b, 2001). Current findings based on people who completed the program support the proposition of both affective and cognitive empathy as potential mechanisms underlying the effects of REACH. However, these conclusions are limited by findings suggesting that people higher in dispositional cognitive empathy may be more likely to complete the program in online format, whilst those dispositionally disposed to feel empathic concern for others may make stronger gains on completion. Thus, improvements are stronger for people already somewhat dispositionally empathic. Nevertheless, mediation analyses suggest that cognitive empathy exercises in the REACH program have both direct and indirect influences on forgiveness outcomes as pre-post increases in affective empathy and the attribution of non-malicious intent to the offender both partially mediate the effect of cognitive empathy change on forgiveness change.

The finding that, from pre- to post-REACH, affective empathy fully mediated the effect of humility on forgiveness is consistent with previous evidence that humility predicts understanding, generosity and kindness toward others (Exline et al., 2008; Exline & Hill, 2012), and lends support to Worthington's assertion that humility facilitates the altruistic gift of forgiveness to the offender (1998b). Further to the finding that the effect of cognitive empathy on forgiveness is partially mediated by affective empathy, the humility exercises in REACH may be understood as a particular form of cognitive empathy, where the participant works on understanding the perspective of the offender by reviewing their own experiences of behaving hurtfully and longing to be forgiven. Earlier studies have found evidence of a link between personal capability and forgiveness, that is, when people recall an offense they committed which

is similar to the offense committed against them, they found the target offense easier to understand and were subsequently more forgiving (Exline et al., 2008). Current findings for humility may represent a similar mechanism, although the similarity between offenses experienced and committed was not measured.

Thus, the current study demonstrates the importance of further exploring mediating factors in forgiveness intervention studies. In particular, studies with larger sample sizes will allow for multi-mediation analyses which may assist in understanding the interaction of empathy related variables as mechanisms underlying the effectiveness of forgiveness interventions.

Previous cross-sectional research has identified several social-cognitive factors proximal to an interpersonal transgression as correlates of state forgiveness (Blatt & Wertheim, 2015; Fehr et al., 2010; Koutsos et al., 2008; Riek & Mania, 2012). In addition to developing brief state measures of humility and offense-specific empathic responses which facilitated the findings discussed above, the current study demonstrates the importance of considering such contextual factors in longitudinal forgiveness research. Current findings suggest that attributing non-malicious intent to the offender predicts better program outcomes, and that further increases in non-malicious intent may represent a mechanism of change underlying the effects of REACH. These findings are consistent with theoretical linkages between benign responsibility attributions and forgiveness (Fincham et al., 2002). Considered in terms of attribution theory (Wiener, 1995), increases in non-malicious intent may be understood as shifting attributions about the offender's transgression from internal to external (i.e., influenced by context rather than personality) or intentional to unintentional. As increases in non-malicious intent partially mediated the effect of pre-post changes in cognitive empathy on forgiveness change, a likely explanation is that empathy exercises facilitated re-consideration of the offender's intentions. For example, reflecting on the context of the offence from the offender's point of view may help people consider situational or mitigating circumstances as alternative explanations for hurtful behaviour. This is consistent with previous research linking empathy with situational attributions

for social failure by others (Gould & Sigall, 1976). In addition, psychoeducation in Module 4 of REACH (Worthington et al., 2012) explicitly addresses the tendency to base attributions about the negative behaviour of others on character rather than circumstances (i.e., fundamental attribution error; Ross, 1977) and may have enhanced motivation to consider the offender's perspective.

Findings from the current study also suggest that holding condoning-related beliefs, for example regarding forgiving an offender as equivalent to excusing or minimising transgressive behaviour, may inhibit forgiveness by reducing motivation to persist with a forgiveness-promoting intervention. In addition, the finding that reductions in this belief were associated with greater effectiveness of online REACH suggests that psychoeducation challenging condoning beliefs may contribute to the effectiveness of a forgiveness program. One explanation for this finding may be that people holding condoning-related beliefs may be less willing to consider a transgression from an offender's perspective, thus condoning beliefs may act as a barrier to fully engaging with empathy promoting elements of the program.

In summary, the combined evidence for mechanisms of change underlying the effectiveness of online REACH suggest a theoretical model for the relationships between context specific cognitive empathy, humility, affective empathy, condoning-related beliefs, attributions about the offender's intent, and forgiveness which is illustrated in Figure 8. The model shows the direct and indirect effects of REACH components which encourage empathy for the offender and humility regarding one's own capability of hurting others, as well as more speculative effects of the psychoeducation component addressing forgiveness-related beliefs. As mediation modelling in the current study did not include all variables at the same time, the model requires more comprehensive testing in research utilising a larger sample of participants, as well as validated measures of humility and cognitive empathy.

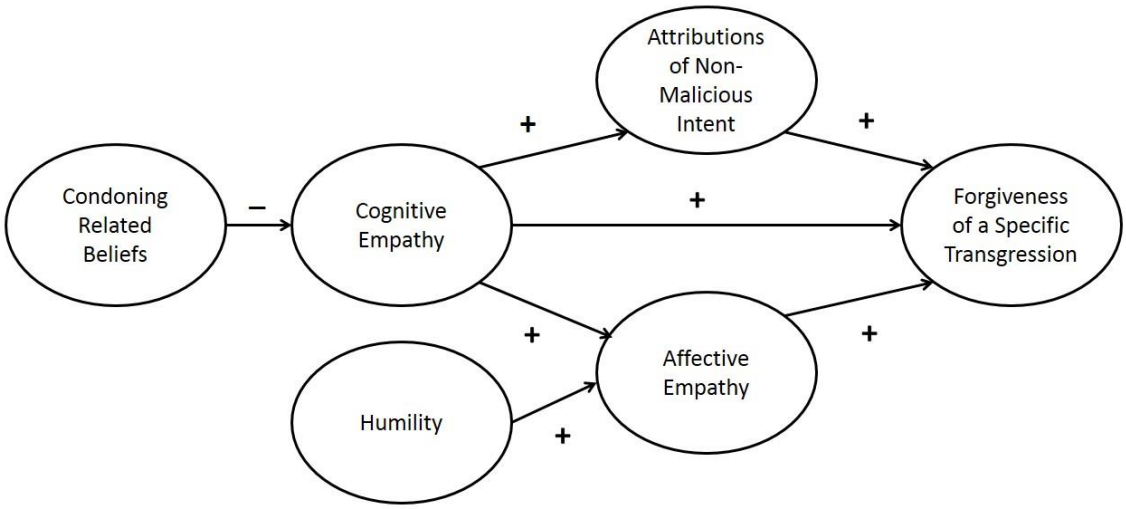

Figure 8. Summary theoretical model showing proposed positive relationships and mediation pathways between condoning-related beliefs, cognitive empathy, humility, affective empathy, attributions of non-malicious offender intent, and forgiveness.

Practical Implications

The present research provides evidence of an online REACH-based forgiveness intervention as an accessible and affordable way to promote forgiveness among community-based adults who complete the program. In the general community, and in clinical populations, reductions in the ongoing negative emotions and rumination associated with unforgiveness may be associated with improved relationships, psychological wellbeing, and health (Davis et al., 2015; Fincham, 2015; Griffin et al., 2015; Larkin et al., 2015). Readily available psychoeducational material regarding forgiveness, and self-directed online forgiveness interventions may benefit members of the community who are willing to consider forgiveness as an emotional coping strategy.

Findings that online REACH was less effective for people dealing with higher intensity of hurt feelings associated with abusive transgressions was in contrast to previous research findings

based on group or individual forgiveness interventions (Wade et al., 2014). The current findings suggested that feelings such as humiliation, betrayal, deception, and abuse may be particularly difficult to work through, whereas intensity of hurt feelings related to relationship loss or rejection did not appear to moderate outcomes. It has also been suggested that unforgiveness in the context of shame may serve a protective function for some people (Sandage et al., 2015). A tentative conclusion is that those affected by these shame-based transgression-related responses may require the additional support such as that provided by face-to-face delivery of forgiveness interventions. Another implication of this finding may be that online REACH or other self-directed forgiveness programs could be modified to address shame-related feelings more directly by offering additional psychoeducation or experiential exercises to people who indicate high intensity of one or more of these types of hurt feelings.

Alternatively, future protocols for treatment of unforgiveness could follow a stepped care approach, where self-directed interventions are recommended for loss-related hurt feelings or mild to moderate shame-based hurt feelings (Mains & Scogin, 2003). The current research suggests several additional factors which might be considered in screening prospective clients for forgiveness interventions used in stepped care approaches. Findings regarding factors which predict persistence with online REACH modules suggest that people who are more inclined to understand the perspective of others, more conscientious, and more willing to forgive the target offender may be more likely to complete the program. Current findings also suggest that people with higher levels of trait empathic concern were likely to benefit more from online REACH than those with lower levels of this trait. Taken together, the findings of the current research suggest that a brief pre-assessment screening questionnaire for prospective online REACH clients might focus on measuring abuse- or shame-related hurt feelings, trait forgiveness and empathy, conscientiousness, and willingness to consider forgiveness as a way of coping with their transgression related distress.

Whilst further research would be needed to identify optimal cut-off points if screened this way, high levels of abuse-related feelings and low levels of the remaining variables would indicate clients who may not benefit from self-administered online REACH. Such clients may instead be offered a therapist-moderated version of online REACH as the additional support offered by interaction with a trained forgiveness facilitator may improve program effectiveness for some people (Gellatly et al., 2007; Spek et al., 2007). For example, a large Australian-based online program, Anxiety Online, offers both purely self-administered and therapist-assisted options (Klein, Meyer, Austin, & Kyrios, 2011). However, further empirical evidence is needed to support this suggestion. Options for research into therapist moderation of online REACH are discussed in the section on Directions for Future Research (p. 222).

Alternatively, evidence-based self-directed or online forgiveness interventions may also be useful as adjuncts to traditional psychotherapy or counselling. Forgiveness-promoting programs as adjunct interventions might even be considered as a “step up” from purely self-administered forgiveness programs such as online REACH in the current format. For example, online REACH modules could be completed by clients between sessions and reviewed during therapy as required. Clinicians or future researchers evaluating this approach could utilise a therapist’s manual similar to the manual used by REACH group facilitators (Worthington & Scherer, 2006).

Findings from the current research which emphasise empathic processes in forgiveness may also have implications for psychologists and counsellors working with clients suffering unforgiveness as a result of an interpersonal transgression, especially those who report repeated difficulties coping with the stress of such transgressions. The present research suggests that people who are supported to understand the context and motivations of the offender may be more likely to develop forgiveness. Whilst a therapeutic goal of forgiveness may be contraindicated in some circumstances, for example, clients experiencing ongoing abuse, the current findings suggest that efforts to increase emotional empathy for an offender can be

facilitated through exercises focusing on cognitive empathy and humility. Similarly, provision of psychoeducation about forgiveness, such as the distinction between forgiveness and excusing or condoning the offence, may have benefits for clients in individual therapy. As the current findings may be attributable to other factors, further research into natural forgiveness processes and the mechanisms underlying forgiveness intervention effectiveness are needed in order to strengthen conclusions about putative mechanisms of action and clarify the applicability of intervention elements to psychotherapy.

Strengths of the Current Research

There is a substantial body of empirical research supporting the effectiveness of interventions to promote forgiveness of interpersonal transgressions. Most forgiveness intervention research conducted to date has investigated models developed by Robert Enright (Enright & Human Development Study Group, 1991; Enright & Fitzgibbons, 2000) and Everett Worthington (1998b, 2001; Worthington et al., 2012). The REACH model (Worthington, 2001) has been investigated primarily in group intervention formats, and in Christian and secular versions; however, recent research has also demonstrated effectiveness of the model in self-directed workbook format for individuals. To date, there is evidence of the effectiveness of the REACH intervention for university students and community populations in the United States, older Swiss adults, and Arab Israeli adolescents.

The present research adds support to previous research and extends findings in a number of ways. First, the present research facilitated the evaluation of a self-directed, online adaptation of the REACH program for individual participants. Whilst recent research has evaluated self-directed, electronic workbook versions of REACH, no previous research has appeared to assess the effectiveness of forgiveness interventions in interactive, online formats. In addition, the current study may be the first to evaluate the effectiveness of a forgiveness

intervention in an Australian sample. Second, the current research investigated a broad range of outcomes, including measures of both forgiveness (overall forgiveness, decisional and emotional forgiveness) and unforgiveness (avoidance and revenge motivations), forgiveness-related measures such as empathy and rumination, and psychological wellbeing measures (depression and stress). These were generally well validated and highly used measures. Whilst research into these outcomes is not unique, few previous forgiveness intervention studies have examined evidence for reduction in stress responses (Akhtar & Barlow, 2016; Wade et al., 2014). The current research included a three-month follow-up period which enabled examination of the extent to which effects of the intervention were maintained after completing the intervention. Previous forgiveness intervention research has focused on state forgiveness outcomes as interventions tend to target a specific transgression; however, the current research, along with two recent REACH studies (Greer et al., 2014; Sandage et al., 2015), found evidence suggesting that REACH may promote forgiveness across other situations (i.e., trait forgiveness), although these findings require replication in research utilising a control group.

The randomised design and inclusion of a control group for post-course comparisons, along with the large effect sizes, increase confidence that the findings in relation to online REACH effectiveness are robust. To further investigate the generalizability of the findings, pre-program and within-program factors which may have moderated effectiveness of online REACH were evaluated. Previous forgiveness intervention research has rarely, if ever, included investigation of attrition or adherence to forgiveness promoting programs. While previous research investigating adherence to online interventions has focused on factors relating to program or system design; the current research included detailed analysis of participant dispositions, attitudes, and within-program behaviours as factors predicting initial engagement in, and persistence with, the online program. Future studies might improve on this approach further by including further systematic evaluation of factors relating to participant dropout or non-adherence. This could be done via brief post-attrition questionnaires or in-progress

satisfaction evaluation, and could include indicators of the stage at which participants cease engagement with the intervention.

Limitations of the Current Research

An important limitation in the current study was the small sample size which was the result of substantial post-randomisation attrition. The sample size placed limitations on the statistical methods available to test hypotheses; for example, multiple regression analyses could not be performed in Study 3 moderation and mediation analyses. In addition, the high attrition rate between Time 1 and Time 2 (51.5%) limited the usefulness of intention-to-treat analyses for pre-post comparisons; consequently, the results may be affected by systematic biases and inferences regarding the effectiveness of online REACH must be made with caution (Little et al., 2012). Uneven attrition, that is, differences between those who completed the intervention stage of the study and those who dropped out after randomisation also limit interpretation of results. Specifically, that findings regarding the efficacy of online REACH should be limited to those who are comparatively older and more empathic, emotionally forgiving, and non-vengeful towards their offender, and that the effectiveness of the program for people who are experiencing higher levels of unforgiveness, or who have not decided to attempt forgiving, is unknown.

High attrition in the current study may also have exacerbated the likelihood of volunteer or self-selection bias, as findings from Study 2 indicate that people who left the study may have included those less willing to forgive the specific offender selected for the study. Attrition after randomisation may also have been influenced by participants viewing the intervention as an optional component of research participation. In addition, although the current sample was community based rather than being drawn entirely from university undergraduate populations, it comprised mostly women who were predominantly well-educated, middle-aged, and Anglo-

Australian. Further, although recruitment aimed at attracting a non-clinical sample consistent with the psychoeducational focus of REACH, means scores for negative affect and severity of the transgression were relatively high. Future studies are needed to investigate the effectiveness of online REACH in more diverse populations.

Second, because online REACH was compared to a waitlist control condition rather than an active or alternative-treatment control the observed effects may be due to nonspecific factors (e.g., participant expectations of improvements, engaging in a structured activity) rather than the content of the intervention. Although, Study 3 analyses that showed lack of halo effects and provided evidence for mechanisms of action suggest that the intervention was operating as expected. In addition, waitlist participants are typically not available for comparison at follow-up; in the current study this meant that results for maintenance of gains three-months after completing online REACH may be confounded by the effects of time or salience of the study. In addition, trait forgiveness was only assessed at follow-up. Whilst trait changes were not expected by immediate post-intervention, the lack of a control condition at follow-up meant that observed trait changes could not be attributed to online REACH. Recruiting participants for psychological intervention studies can be challenging given the time commitment required, and utilisation of a brief waiting time to accrue non-treatment controls allays potential participant and ethical concerns about missing out on the treatment. Studies which investigate the efficacy of online forgiveness interventions compared to alternative treatments may require additional resources, but would address the above limitations by accruing stronger evidence of treatment efficacy and maintenance at follow-up.

As with most forgiveness intervention research, the current findings rely on self-report measures, which may be subject to acquiescence or social desirability biases (Hoyt & McCullough, 2005). More rigorous methods of assessment have been utilised in forgiveness research, including biomarkers (Larkin et al., 2015; Witvliet et al., 2001) and observer or significant other reports (Hodgson & Wertheim, 2007), and inclusion of these more objective

forms of measurement in future forgiveness intervention research may strengthen findings. The current research used a very brief measure of personality traits, the Mini-IPIP (Donnellan et al., 2006), to avoid imposing an undue burden on participants. The Mini-IPIP, whilst showing acceptable validity in comparison with other Big Five measures of personality (Cooper et al., 2010; Donnellan et al., 2006), has only four items per trait; these items may not sufficiently cover all facets associated with the traits. Hence results for hypotheses involving personality (e.g., the non-significant finding for agreeableness as a moderator of online REACH effectiveness) should be interpreted with caution. Further, the internal structure of the new social-cognitive factors, empathic responses and humility, should be confirmed in independent samples.

Directions for Future Research

As described earlier, the majority of the current findings regarding the effectiveness of an online, self-directed adaptation of REACH require confirmation in research which addresses some of the limitations in the current study. Specifically, future research with a larger and more diverse sample size would increase confidence in the generalizability of the findings and provide additional power for statistical analyses to explore multivariate models for moderation and mediation of effects. Intervention studies with sufficient power would also facilitate research into effects on outcomes such as psychological wellbeing which may be expected to show more modest effects than for forgiveness, although these effects may be clinically significant (Wade et al., 2014). Research designs which facilitate component analysis, such as dismantling studies, may also further develop understanding of the role played by cognitive and affective empathy and humility in forgiveness intervention effectiveness. For example, versions of REACH with and without the humility-inducing exercises could be compared for their effects on forgiveness and empathy.

Prior to the current research, there has been limited understanding of the factors impacting on participants withdrawing from forgiveness intervention studies. In large part this may have been due to relatively low attrition rates; however, the current research, with an attrition rate more closely aligned with those reported in studies of other online interventions (Christensen et al., 2009; Kelders et al., 2012), has highlighted the importance of utilising study methods which include efforts to obtain information about participants' reasons for disengaging from the study. Such information may help researchers understand barriers faced by people seeking to forgive, as well as offer ideas for improvements in intervention formats and design. At the same time, such post-dropout contact may provide the opportunity to further strengthen research findings by obtaining post-course and follow-up data which would facilitate the inclusion of intention-to-treat analyses.

There has also been limited exploration of the effectiveness of forgiveness interventions at promoting increases in cross-situational forgiveness and forgiveness-related responses such as perspective taking. The current findings provided some evidence that trait changes in forgiveness are possible at follow-up; however, like previous findings (Greer et al., 2014; Sandage et al., 2015) these cannot be confidently attributed to the effects of the intervention. Apart from being a valuable end in themselves, the development of interventions that increase trait forgiveness may also facilitate longitudinal study of the associations between trait forgivingness and physical and psychological health.

Forgiveness interventions in clinical populations. Further, whilst research has convincingly established an association between forgiveness and physical and psychological health (Akhtar & Barlow, 2016; Griffin et al., 2015; Larkin et al., 2015), forgiveness intervention research in clinical samples has been limited. Controlled, longitudinal studies are needed to further investigate the effectiveness of forgiveness interventions on individual wellbeing and to assist in identifying the direction of causal relationships in the forgiveness-health association. Ideally, such research would also incorporate disease-specific neurologic, endocrine and

immunological markers, or relevant psychological symptom inventories, in addition to self-report measures of stress, subjective wellbeing, and forgiveness (Elliott, 2015). Clinical populations who live with chronic health conditions known to have social and interpersonal etiologies (e.g., obesity, addictions, diabetes, cardiopulmonary disease) or those whose conditions are exacerbated by stress (e.g., chronic pain, fibromyalgia) may derive a particular benefit from forgiveness interventions which, as the current research demonstrates, may relieve stress (Elliott, 2011, 2015; Offenbacher, Dezutter, Vallejo, & Toussaint, 2015).

As noted in the introduction, most previous research assessing health-related outcomes of forgiveness interventions has been undertaken by the Enright research group (Freedman & Enright, 1996; Ingersoll-Dayton et al., 2009; Lee & Enright, 2014; W. F. Lin et al., 2004; Reed & Enright, 2006; Waltman et al., 2009). In the main, REACH has been targeted at non-clinical populations, as Worthington's intention was that REACH be regarded as a psychoeducational program rather than as psychotherapy (Worthington & Scherer, 2006). However, one recent study investigated outcomes of a REACH component incorporated into an outpatient DBT treatment protocol for adults with Borderline Personality Disorder (Sandage et al., 2015), demonstrating that a fruitful direction for forgiveness intervention studies may be to examine REACH in combination with, or adapted to complement, existing psycho-social treatments for some clinical conditions. Other researchers have begun investigating the effect of forgiveness education among fibromyalgia patients, finding that forgiveness may be perceived as an acceptable form of emotional coping which is within an individual's control and may relieve pain (Toussaint et al., 2014). These interventions have typically required delivery by practitioners skilled in forgiveness interventions. Future research into the effect of accessible, low-cost forgiveness interventions on physical health is needed, for example in studies which incorporate comparisons with treatment as usual. People living with chronic disease may be especially receptive to the accessibility and self-paced nature of an online forgiveness intervention which makes minimal demands on patients who may already be managing a high treatment burden.

Design and delivery considerations in online forgiveness interventions. In addition to research confirming the effectiveness of online REACH, further research is needed to identify additional factors which influence adherence and persistence in online forgiveness programs. As noted above, individual differences and transgression related factors explained less than half the variation in persistence with online REACH after commencement. It is possible that the substantial drop-out observed in the current study was partly due to factors intrinsic to the design and delivery mode of the intervention; these factors are experienced by all participants and may be most proximate to the participant's experience whilst engaging in the program.

A limitation of previous research into online interventions is that few researchers have examined program design or delivery factors in predicting adherence to treatment. In a systematic review of 83 internet-based health interventions, Kelders and colleagues (2012) coded studies by intervention characteristics and use of persuasive technology elements. Persuasive systems design (PSD) is a schematic comprising 28 design principles theorised to enhance effectiveness of information systems designed to reinforce, change or shape attitudes or behaviours (Oinas-Kukkonen & Harjumaa, 2009). The PSD elements examined in the systematic review included those designated for primary task support (i.e., elements directly focused on helping participants achieve the target behaviour), dialogue support (elements which interact with the user to provide feedback) or social support (elements which enable interaction, comparison or observation of other users) (Kelders et al., 2012; Oinas-Kukkonen & Harjumaa, 2009). The resultant regression model explained 55% of the variance in adherence, with factors in the model predicting better adherence including more interaction with a counsellor, more frequent intended usage, and more extensive employment of dialogue support (e.g., reminders and suggestions regarding target behaviours; Kelders et al., 2012).

Research into the impact of variations in dialogue and social support is recommended as a next step for online forgiveness interventions. Mohr, Cuipers and Lehman (2011) argue that human support enhances adherence to, and effectiveness of, internet-based health

interventions through accountability to a person, a counsellor for example, who is seen as trustworthy, benevolent and having expertise. In the current research, human support was minimal; including standardised emails and reminders, as well as email or telephone responses by the student investigator to participant questions. Although some evidence suggests that input from therapists or facilitators is associated with larger effect sizes in internet-based or self-help interventions (Gellatly et al., 2007; Spek et al., 2007), another review suggests that programs can be effective without therapist input (Griffiths et al., 2010). The current findings are consistent with the latter review; however, one explanation of the high attrition observed is that some participants may have persisted further, and gained the benefits of online REACH, if more human support had been available. Further, in the current study, people dealing with more intense feelings of hurtfulness associated with abusive transgressions were found to receive less benefit from the intervention. A possible explanation is that those working on forgiving these types of hurts needed more support. Future research could examine this by comparing a non-moderated online forgiveness intervention with a version of the intervention moderated by a psychologist or counsellor. Moderation of the online REACH adaptation could be personalised with relatively little effort; for example, the moderator could read and respond to participant comments at the end of each module, an individual telephone or webchat session could be scheduled at the program midpoint, or, in a less client-specific but more efficient manner, audio or video introductions featuring the moderator could preface each module.

Conclusion

Centuries of interest in forgiveness suggests that interpersonal transgressions are an enduring feature of human social interaction, and that related individual and community suffering is substantial. The capacity to forgive others for interpersonal hurts and offenses, large and small, appears to be a crucial life skill associated with personal wellbeing and life satisfaction. Forgiveness-promoting interventions, whilst a relatively recent phenomenon, have demonstrated that structured attention to forgiveness processes can assist people to overcome transgression related distress. However, due to their specialised nature, access to evidence-based forgiveness programs is limited.

The current research has advanced research in the area of forgiveness interventions by providing initial evidence of the effectiveness of a self-directed, online adaptation of REACH. Interactive online interventions are valued for their anonymity, affordability and accessibility at all times and locations; thus, future research consolidating evidence for the effectiveness of brief online interventions promoting forgiveness and further refining the most effective contexts for their use may lead to significant benefits for individuals, families and communities.

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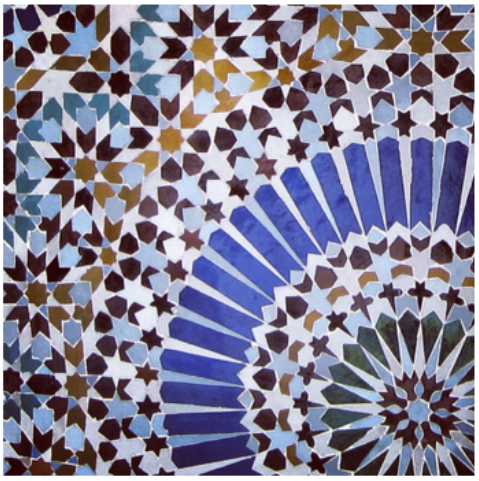
Appendix A

Sample Advertisement Used for Participant Recruitment

LA TROBE UNIVERSITY

School of Psychological Science
Faculty of Science, Technology and Engineering

LEARNING FORGIVENESS PROJECT



EXPLORING THE PROCESS OF FORGIVING OTHERS

This research study aims to evaluate the effectiveness of a self-paced, online course which helps develop skills in moving on from hurtful transgressions by other people. Forgiveness is one way of dealing with the experience of ongoing anger and hostility. If you have experienced any unfair or hurtful action by someone you know and you still feel some resentment, anger, hurt or upset about it, we would like to invite you to take part in this study.

Examples of unfair or hurtful actions might be the other person:

* Acting in an insensitive or unsupportive way
* Breaking up your friendship or relationship
* Lying to, or betraying you
* Betraying a confidence or spreading rumours
* Being harsh, critical or rude
* Unfairly judging you
* Being unfaithful
* etc.

Anyone over 18 can participate. You will complete an online survey (30 minutes) which includes questionnaires about how you think, feel and behave in a variety of situations, including hurtful events and conflicts. You can also complete a free, evidence-based program called ***REACH for Forgiveness*** *(approx. 6 hours)*, which aims to help you learn steps to forgiveness.

Participation is all online. Genuine participants who complete additional questionnaires (20 minutes) after finishing the course will be paid $15 (Coles/Myer or Amazon voucher) per questionnaire they are asked to complete (typically participants receive a total of $30 or $45).

This study is a Clinical Psychology doctoral research project in the School of Psychological Sciences, La Trobe University, Faculty Human Ethics Committee approval number FHEC13/R97. Further information available by email to janation@students.latrobe.edu.au or on Facebook at https://www.facebook.com/groups/learningforgivenessproject/

Appendix B

Questionnaires Used at Time 1

Demographics.

What is your gender?

- Female
- Male

How old are you? *[if under 18 years, exits survey with thanks for their time and interest]*

What is the highest level of education that you have completed?

- Unfinished high school
- Year 12
- Unfinished university degree
- TAFE certificate
- TAFE diploma
- Undergraduate degree
- Postgraduate degree
- Other (please specify)……

What country do you currently live in?

- Australia
- Other (please specify) ……..

Please describe your ethnicity:

- Anglo-Australian
- Aboriginal or Torres Strait Islander
- South-East Asian
- European
- Other (please specify) ……..

How religious to you consider yourself to be?

- Not at all
- A little
- Moderately
- Very
- Extremely

What is your religious affiliation?

- None
- Protestant Christian
- Catholic
- Other Christian
- Jewish
- Muslim
- Buddhist
- Hindu
- Other (please specify)……

Trait forgiveness

Trait Forgivingness Scale (TFS) (Berry, Worthington, O'Connor, Parrott, & Wade, 2005)

Please indicate the degree to which you agree or disagree with each statement

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 People close to me probably think I hold a grudge too long

2 I can forgive a friend for almost anything

3 If someone treats me badly, I treat him or her the same

4 I try to forgive others even when they don't feel guilty for what they did

5 I can usually forgive and forget an insult

6 I feel bitter about many of my relationships

7 Even after I forgive someone, things often come back to me that I resent

8 There are some things for which I could never forgive even a loved one

9 I have always forgiven those who have hurt me

10 I am a forgiving person

Trait empathy

Interpersonal Reactivity Index (IRI) (Davis, 1980), Perspective Taking and Empathic Concern subscales.

The following statements inquire about your thoughts and feelings in a variety of situations. Indicate how well each item describes you:

Rated from 1 (*does not describe me well*) to *5 (describes me very well)*

1 I often have tender, concerned feelings for people less fortunate then me

2 I sometimes find it difficult to see things from the other person's point of view

3 Sometimes I don't feel very sorry for other people when they are having problems

4 I try to look at everybody's side of a disagreement before I make a decision

5 When I see someone being taken advantage of, I feel kind of protective towards them

6 I sometimes try to understand my friends better by imagining how things look from their perspective

7 Other people's misfortunes and problems do not usually disturb me a great deal

8 If I'm sure I'm right about something, I don't waste much time listening to other people's arguments

9 When I see someone being treated unfairly, I sometimes don't feel very much pity for them

10 I am often quite touched by the things that I see happen

11 I believe there are two sides to every question and try to look at them both

12 I would describe myself as a pretty softhearted person

13 When I'm upset at someone, I usually try to "put myself in his/her shoes" for awhile

14 Before criticizing somebody, I try to imagine how I would feel if I were in their place

Personality

International Personality Item Pool, Short Form (Mini-IPIP; Donnellan, et al., 2006)

The following phrases describe a range of personal characteristics. Please use the rating scale below to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.:

Rated from 1 (*very inaccurate*) to *5 (very accurate)*

1 Am the life of the party

2 Sympathize with others' feelings

3 Get chores done right away

4 Have frequent mood swings

5 Have a vivid imagination

6 Don't talk a lot

7 Am not interested in other people's problems

8 Often forget to put things back in their proper place

9 Am relaxed most of the time

10 Am not interested in abstract ideas

11 Talk to a lot of different people at parties

12 Feel others' emotions

13 Like order

14 Get upset easily

15 Have difficulty understanding abstract ideas

16 Keep in the background

17 Am not really interested in others

18 Make a mess of things

19 Seldom feel blue

20 Do not have a good imagination

Psychological wellbeing

Depression Anxiety Stress Scales (DASS-21; P. F. Lovibond & Lovibond, 1995)

Please read each statement and choose a number which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement:

Rated from 0 (*did not apply to me at all*) to 4 (*applied to me very much of the time*)

1 I found it hard to wind down

2 I was aware of dryness in my mouth

3 I couldn't seem to experience any positive feeling at all

4 I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)

5 I found it difficult to work up the initiative to do things

6 I tended to over-react to situations

7 I experienced trembling (e.g., in the hands)

8 I felt that I was using a lot of nervous energy

9 I was worried about situations in which I might panic and make a fool of myself

10 I felt that I had nothing to look forward to

11 I found myself getting agitated

12 I found it difficult to relax

13 I felt down-hearted and blue

14 I was intolerant of anything that kept me from getting on with what I was doing

15 I felt I was close to panic

16 I was unable to become enthusiastic about anything

17 I felt I wasn't worth much as a person

18 I felt that I was rather touchy

19 I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)

20 I felt scared without any good reason

21 I felt that life was meaningless

Transgression situation

During this research study, you will learn to develop forgiveness by working with a specific hurt or offense. In the next section, you will be asked to think of a specific time when someone you know said or did something which offended or hurt you, or which involved treating you unfairly.

This is an important choice. During the whole forgiveness course, we will be asking you to consider this example and work with it through a series of steps to explore learning about forgiveness. You will get the most out of the exercises in the course if you choose a situation to work on where you have not completely forgiven the person who hurt you, even though you may have tried, and that you still feel resentment, hurt or anger about the event or situation.

Making the most out of the situation you choose: If you were learning to play a sport, like soccer, you wouldn't try to learn your new skills by playing in the World Cup finals! You would be more likely to develop your skills and confidence in a low stakes game or practice session. In the same way, if you choose a really difficult offense that you still need to forgive – such as physical abuse as a child, the murder of a close relative, or abandonment by a parent at a young age – you may have difficulty learning the forgiveness skills because the event is especially hard to forgive.

Also, sometimes hurtful offenses can be one-time events (for example, your normally reasonable boss criticizes you very harshly), whilst other hurts are repeated events involving new transgressions almost every time you and the other person are together. Such ongoing or repeated hurtful events can make it difficult to learn skills as the particular hurts can become blurred. In particular, we recommend you do not choose to work on forgiveness of a person who is currently subjecting you to ongoing violence or serious abuse. So we suggest choosing a relatively isolated event of moderate hurtfulness or offensiveness, and one which you still feel resentment, hurt or anger about. For the remainder of this research study, you will be asked to reflect upon your thoughts and feelings about this person and the situation. If you would like to talk to someone about your choice of event, please contact the student investigator, Jennifer Nation before continuing with the study. Jennifer can be contacted on 9479 3073 or at learningforgiveness@latrobe.edu.au. Please leave a message including your name, contact phone number and a good time to reach you. study, you will be asked to reflect upon your thoughts and feelings about this person and the situation.

Please briefly describe the hurtful situation in the space provided (you can change the names of other people if you like).

Situation specific measures

The following questions relate to the hurtful situation and the individual person who hurt you.

What is your relationship with this person?

- Friend
- Boss / Supervisor
- Colleague / co-worker
- Partner / Spouse
- Former partner
- Family member
- Other (please specify) …….

How long ago did the hurtful situation happen?

- Please specify (in years, months, weeks or days) …….

To what extent have you forgiven the person who hurt you?

Rated from 1 (*not at all*) to 10 (c*ompletely*).

Willingness to forgive

To what extent would you like to forgive the person if you could?

Rated from 1 (*no desire to forgive*) to 10 (*wish I could forgive*)

Please answer the following questions about your relationship with the person who hurt you and the hurtful situation.

Relationship closeness

How close was your relationship before the offence?

Rated from 1(*not at all close*) to 10 (*extremely close*)

Transgression severity

How would you rate the severity of the offence?

Rated from 1 (*not at all severe*) to 10 (*extremely severe*)

State forgiveness

Emotional Forgiveness Scale (EFS; Worthington, Hook, Utsey, Williams, & Neil, 2007)

Think of your current emotions toward the person who hurt you. Indicate the degree to which you agree or disagree with the following statements:

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 I care about him / her

2 I no longer feel upset when I think of him / her

3 I'm bitter about what he / she did to me

4 I feel sympathy toward him / her

5 I'm mad about what happened

6 I like him / her

7 I resent what he / she did to me

8 I feel love toward him / her

Decisional Forgiveness Scale (DFS; Worthington, Hook, Utsey, Williams, & Neil, 2007)

Think of your current intentions toward the person who hurt you. Indicate the degree to which you agree or disagree with the following statements:

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 I intend to try to hurt him / her in the same way he / she hurt me

2 I will not try to help him / her if he / she needs something

3 If I see him / her, I will act friendly

4 I will try to get back at him / her

5 I will try to act towards him or her in the same way I did before he / she hurt me

6 If there is an opportunity to get back at him / her, I will take it

7 I will not talk with him / her

8 I will not seek revenge upon him / her

Rye Forgiveness Scale (RFS; Rye et al., 2001)

Think of how you have responded to the person who has wronged or mistreated you. Indicate the degree to which you agree or disagree with the following statements.

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 I cant's stop thinking about how I was wronged by this person

2 I wish for good things to happen to the person who wronged me

3 I spend time thinking about ways to get back at the person who wronged me

4 I feel resentful toward the person who wronged me

5 I avoid certain people and/or places because they remind me of the person who wronged me

6 I pray for the person who wronged me

7 If I encountered the person who wronged me I would feel at peace

8 This person's wrongful actions have kept me from enjoying life

9 I have been able to let go of my anger toward the person who wronged me

10 I become depressed when I think of how I was mistreated by this person

11 I think that many of the emotional wounds related to this person's wrongful actions have healed

12 I feel hatred whenever I think about the person who wronged me

13 I have compassion for the person who wronged me

14 I think my life is ruined because of this person's wrongful actions

15 I hope the person who wronged me is treated fairly by others in the future

State unforgiveness

Transgression Related Interpersonal Motivations Inventory, Revenge and Avoidance subscales (TRIM; McCullough & Hoyt, 2002; McCullough et al., 1998)

Please indicate your thoughts and feelings about the specific person who hurt or offended you.

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 I'll make him / her pay

2 I wish that something bad would happen to him / her

3 I want him / her to get what he / she deserves

4 I'm going to get even

5 I want to see him / her hurt and miserable

6 I keep as much distance between us as possible

7 I live as if he / she doesn't exist, isn't around

8 I don't trust him / her

9 I find it difficult to act warmly towards him / her

10 I avoid him / her

11 I cut off the relationship with him / her

12 I withdraw from him /her

State empathy

Batson's Empathy Adjectives (BEA; Coke, Batson, & McDavis, 1978)

Please rate the degree to which you feel each of the following feelings for the person who hurt you right now.

Rated from 1 (*not at all*) to *5 (extremely)*

Concerned

Empathic

Compassionate

Soft hearted

Warm

Rumination

Rumination about an Interpersonal Offense Scale (RIOS; Wade, Vogel, Liao, & Goldman, 2008)

The following statements describe reactions people can have to being hurt by others. Think back over your experience in the last seven days and indicate your agreement or disagreement with the following statements in relation to the specific person who hurt or offended you.

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 I can't stop thinking about how I was wronged by this person

2 Memories about this person's wrongful actions have limited my enjoyment of life

3 I have a hard time getting thoughts of how I was mistreated out of my head

4 I try to figure out the reasons why this person hurt me

5 The wrong I suffered is never far from my mind

6 I find myself replaying the events over and over in my mind

Social-cognitive factors related to forgiveness

Factors Related to Forgiveness Inventory (FRFI; Blatt & Wertheim, 2015)

Note: Items 27 to 34 were developed for the current research.

Keeping the same situation in mind, please rate how much you agree with each of the following statements:

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 I realised the person had not done the act on purpose to hurt me.

2 The person (the offender) tried to undo the damage they had caused.

3 I believed the person would never do it again.

4 I realised I valued the relationship with the person.

5 I realised the person had good intentions when they did what they did.

6 People are telling me that the person does not deserve to be forgiven.

7 I felt that if I forgave them it would mean that I was condoning what they did.

8 I still think that this relationship would satisfy some important needs of mine.

9 The person showed signs of remorse.

10 My religious or spiritual beliefs encouraged me to forgive the person.

11 I thought it was likely the person would act in a similar way again.

12 If I forgave them it would have made it seem like what they did was okay to do.

13 I believed that God or a higher spiritual power would want me to forgive the other person

14 The person expressed feelings of guilt for what they did.

15 I thought that the person's intent was most likely benign

16 People are telling me I should just let go of the relationship.

17 I thought that if I forgave the person I'd be letting the person get away with it.

18 The person who hurt me apologized.

19 If I forgave the person, he/she wouldn't appreciate the seriousness of his/her actions.

20 My religious beliefs were that one should forgive others for their hurtful actions.

21 I believed that the person would repeat their hurtful action.

22 I realised that what they did was not personal.

23 I thought that this transgression was a one time act and would not be repeated.

24 The time and effort I've put into this relationship makes me still value the relationship.

25 Other people have said to me that I should not forgive the person.

26 If I forgave the person it would be excusing his/her actions.

27 I have been able to see the situation from the perspective of the person who hurt me

28 I am aware that I have also done hurtful things towards others in my own life

29 I can imagine that in similar circumstances I may also behave hurtfully towards others

30 I can sympathise with what may have led the person to do what they did

31 I have felt sorry for the person

32 I have thought about how we are all capable of wrongdoing

33 I find it difficult to imagine sympathetic reasons for the person doing what they did

34 I have thought about the painful experiences that may have led them to do what they did

Appendix C

Additional Questionnaires Used at Time 2

Social-cognitive factors relating to forgiveness (present tense)

Factors Related to Forgiveness Inventory (FRFI; Blatt & Wertheim, 2015)

Keeping the same situation in mind, please rate how much you agree with each of the following statements:

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 I believe the person did not act on purpose to hurt me

2 The person tried to undo the damage they had caused

3 I believe the person would never do it again

4 I value the relationship with the person

5 I believe the person had good intentions when they did what they did

6 People have told me that the person does not deserve to be forgiven

7 I believe that if I forgive them it would mean that I am condoning what they did

8 I still think that this relationship satisfies some important needs of mine

9 The person has shown signs of remorse

10 My religious or spiritual beliefs encouraged me to forgive this person

11 I think it is likely the person will act in a similar way again

12 If I forgive them it would make it seem like what they did was okay to do

13 I believe that God or a higher spiritual power wants me to forgive the other person

14 The person has expressed feelings of guilt for what they did

15 I think that the person's intent was most likely benign

16 People have told me I should just let go of the relationship

17 I think that if I forgive the person I'd be letting the person get away with it

18 The person who hurt me has apologized

19 If I forgive the person, he/she won't appreciate the seriousness of his/her actions

20 My religious beliefs are that one should forgive others for their hurtful actions

21 I believe that the person will repeat their hurtful action

22 I realise that what they did was not personal

23 I think that this transgression was a one time act and will not be repeated

24 The time and effort I've put into this relationship make me still value the relationship

25 Other people have said to me that I should not forgive the person

26 If I forgive the person it will be excusing his/her actions

27 I can see the situation from the perspective of the person who hurt me

28 I am aware that I have also done hurtful things towards others in my own life

29 I can imagine that in similar circumstances I may also behave hurtfully towards others

30 I can sympathise with what may have led the person to do what they did

31 I feel sorry for the person

32 I believe we are all capable of wrongdoing

33 I find it difficult to imagine sympathetic reasons for the person doing what they did

34 I have thought about the painful experiences that may have led them to do what they did

Online REACH Evaluation (adapted from Wade et al., 2009)

Finally, we are interested in your overall experience of the online REACH for Forgiveness program. Please indicate how much you agree with the following statements:

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 I am glad that I have completed the online REACH course (1)

2 Completing the REACH course has helped me with the specific past hurt that I worked on during the course

3 The information and skills in the REACH course have helped me with other hurts I have experienced

4 Completing the REACH course has had an impact on my personal relationships

5 I would recommend the REACH course to others

6 The online modules in the REACH course were easy for me to access

7 I liked the fact that the REACH course was available online

Forgiveness understanding

To what extent are each of the following true of forgiveness? Forgiving someone means ....

Rated from 1 (*strongly disagree*) to *5 (strongly agree)*

1 Telling yourself that what happened wasn't so bad

2 Forgetting what happened

3 Pretending that nothing happened

4 Deciding not to take revenge

5 Excusing the person from punishment

6 Continuing in the relationship as before

7 Letting yourself get hurt again

8 Letting go of anger or resentment towards the person

Appendix D

Contents of the Online *REACH for Forgiveness* Program

Module 1

Thought questions: Should forgiveness should be dependent upon repentance by the offender?

Exploring forgiveness themes in literature (literary quotes)

Forgiveness themes in films and fiction (video: links to four YouTube videos)

Forgiveness in songs and music

Differentiating between decisional and emotional forgiveness

Deciding to try to forgive (forgiveness contract)

Module 2

Thought questions: possible benefits of forgiveness for the forgiver

Identifying the benefits of forgiving

Exploring definitions of forgiveness (interactive psychoeducation)

Assessing the hurts – identifying and rating the hurtfulness associated with the transgression

Costs and benefits of nurturing the pain

The burden of forgiveness (audio: guided imagery of unforgiveness symbolized as a burden)

Reflecting on previous experience(s) of forgiving someone

Module 3

Thought questions: effects of holding on to the hurt, comparing a transgression to a loss

Reviewing decisional forgiveness

Introducing the REACH steps (capitalised below)

RECALL THE HURT

Recalling the hurt through imagination (guided relaxation and recall)

Recalling the hurt through writing your story (extended written exercise)

Thinking about events objectively (visualising transgression from perspective of a third party)

Writing about events objectively

Giving the hurt away (audio: guided imagery of symbolically giving hurt away)

Review progress towards decisional forgiveness

EMPATHISING WITH THE OFFENDER

Preparing for empathy step by recalling a time when you hurt someone

Examining relationship closeness and its influence on forgiveness (reflection)

Practising objective recall and empathy of those who hurt us (reflecting on five other interpersonal transgressions and attempting to empathise with the offender)

Reflection on the reasons underlying people's actions (including our own)

List of soothing activities (ideas for self-care following a challenging module)

Module 4

Thought question: are there limits to how far we can empathise with others?

Trying to understand why the person hurt you (written reflection)

Hypothetical conversation with offender (role-play)

Sympathising with the offender (brief questions)

Compassion for the offender (reflection)

FORGIVENESS AS AN ALTRUISTIC GIFT

Writing about an experience of doing something altruistic for another

Story about Holocaust survivor Yehiel Dinur (reflection on forgiveness example)

Psychoeducation about the effect of psychological distance between offender and ourselves; attributions regarding character rather than circumstances

Module 5

Thought questions: gratitude, altruism and expectations about forgiveness

When you needed forgiveness and were forgiven (written description/questions)

Getting in touch with the gratitude we feel for being forgiven (reflection)

The gift of forgiving (guided imagery; selecting a gift to symbolise forgiveness)

Rate the extent of emotional forgiveness achieved so far

COMMIT TO FORGIVENESS

Commit by writing (written exercise)

Complete a certificate of emotional forgiveness (review definitions for emotional versus decisional forgiveness; print and sign a certificate of emotional forgiveness)

Handwashing (symbolic washing of the word "hurt" from hands)

Barriers to completing emotional forgiveness (interactive psychoeducation)

Hypothetical letter expressing forgiveness

Module 6

Review of major concepts (definitions and REACH steps)(interactive psychoeducation)

HOLD ON TO FORGIVENESS WHEN YOU DOUBT

Positive and negative emotional channels (psychoeducation, questions)

Identifying when you might experience doubts about forgiveness

Hold on to forgiveness during reminder experiences (psychoeducation, planning)

Controlling rumination or worry : the white bear phenomenon

Ways to hold on to forgiveness: our suggestions (psychoeducation)

Before and after pictures (drawing or “selfie” exercise)

Helping you remember by rehearsing telling a friend about REACH steps

BECOMING A MORE FORGIVING PERSON (optional 12 exercises, downloadable)

The lesson of a pencil (audio: metaphor of a pencil with an eraser)

Mirror mirror (symbolic exercise recognising face of a person who has been hurt, has hurt others, struggled against unforgiveness, and forgiven)

Burden of unforgiveness (audio: guided imagery of unforgiveness symbolized as a burden which is released by forgiving the offender)

Note. Adapted from *The path to forgiveness: Six practical sections for becoming a more forgiving person, self-directed learning workbook* (Worthington, Lavelock, & Scherer, 2012). Main REACH steps are capitalised. Each module ends by reviewing responses to the thought questions posed at the beginning of the module, then giving the participant an opportunity to identify what they gained form the module and offer feedback.

Appendix E

Participant Information Statement

School of Psychological Science
Faculty of Science, Technology and Engineering

REACH FOR FORGIVENESS

EXPLORING THE PROCESS OF FORGIVENESS & PROMOTING PSYCHOLOGICAL WELLBEING

Background and aims of the study

In most people's lives, relationships with others are occasionally challenged by behaviour which leaves us feeling hurt or wronged. Often, we are able to move on from hurtful situations. Other times we struggle to reconnect with the person who wronged us, or we continue to feel caught up in hurt, resentment or hostility even if we don't intend the relationship to continue.

This study aims to evaluate the effectiveness of a self-paced, online program which helps develop skills for moving on from hurtful transgressions by other people. This will be done by encouraging you to consider forgiving someone you know who has treated you unfairly, hurt or offended you and taking you through some steps to develop forgiveness. The study also looks at the way we think and feel during these times and whether that makes it easier or harder to move on from hurtful events.

REACH for Forgiveness is an evidence-based program which has helped people overcome or reduce the pain and anger they experienced after hurtful situations. Previous research has offered the course as a group program or self-help workbook. In this study we have changed the format of the course so that participants can access all the exercises online.

Your participation in this study will contribute to researchers' understanding of the impact of hurtful interpersonal events and how people recover from them. This information is important for developing counselling and conflict resolution approaches and improving relationships, health and psychological wellbeing.

Who can participate?

Anyone over 18 who has access to a computer with internet and an email account can participate in this project. The main requirement is that you have something or someone to forgive! You will be asked to identify a specific situation where the words or actions of someone you know have caused you to feel hurt, angry, afraid or resentful. As the study involves learning or enhancing forgiveness skills, we suggest choosing an event of moderate hurtfulness.

If I decide to participate, what will be involved?

The study has three main parts.

In Part 1 you will complete an online survey which will take approximately 30 minutes. You will be asked for basic demographic information such as your age, gender and ethnicity, followed by questions regarding how you think, feel and behave in a variety of situations, including hurtful events and conflicts. You will also be asked some questions about a specific time when someone you know said or did something which offended, hurt or treated you unfairly; something that you still feel some resentment, hurt or anger about.

In Part 2 of the study you are invited to complete a brief online course, *REACH for Forgiveness*. The program takes approximately six hours to complete, and can be undertaken at your own pace over a recommended period of two weeks. REACH involves a stepwise series of writing and reflection exercises designed to help you make decisions about forgiveness and build skills to forgive people who hurt you. It will also teach you a process to work through in future situations when you want to forgive somebody. When you finish, you will complete a further set of questionnaires to assist with our research. These questions will include some of the same questions as in Part 1, and some questions asking about your experiences whilst completing the REACH program.

Finally, we will email you in a few months to invite you to complete Part 3 of the study. Like the first part, this involves a questionnaire about your attitudes towards forgiveness and the person who hurt you, and about your experiences in the study. Part 3 is estimated to take 20 minutes.

What else do I need to know?

You can choose to participate only in Part 1 of the study, Parts 1 and 2, or Parts 1, 2 and 3. When you begin Part 2, you may be invited to commence the *REACH for Forgiveness* program immediately, or you may be put on a short waitlist (2- 4 weeks). Participants who are allocated to the waiting list will be asked to complete an additional questionnaire taking approximately 20 minutes. You cannot choose whether to start REACH immediately or go on the waitlist as this random allocation is an important aspect of the research design.

Participation is voluntary and there are no disadvantages, penalties or adverse consequences for not participating or for withdrawing prematurely from the project. You are free to withdraw from the project at any time during the online survey session if you do not want to continue.

Will I be paid for participating?

Participants who complete Parts 2 and 3 of the study will receive a $15 AUD (or equivalent) shopping voucher for each set of questionnaires they complete. The maximum that can be received for participating in the study is $45 (that is, 3 x $15 vouchers), however some participants will only be eligible to receive $30 (that is, 2 x $15 vouchers). Participants can select either Coles/Myer vouchers (Australian residents only) or Amazon vouchers (Australian or international participants).

What will happen to the information I provide?

All the information that you provide in the online survey will be kept confidential. At the beginning of the study you will be allocated a participant access code which will be used to link your responses in different parts of the study. Personal or identifying information will be stored separately from your data. After completion of the study, data will be grouped (e.g., average) for statistical analysis. The data will be kept, for comparison purposes, with other similarly de-identified data from prior and subsequent studies of this sort. The results may be published in a journal article or presented at a conference. If you are interested in the findings arising from this study, you can send an email to the student investigator requesting a copy of the results, which will be available towards the end of 2016.

Sometimes when people think about conflicts or hurtful interpersonal events from the past it can bring up emotions such as hurt, anger or regret. If something has happened that you would like to talk to someone about in person or over the phone we encourage you to contact a counselling service. The researchers can provide information about referrals for counselling.

If you have any comments or concerns regarding this project, please contact the project supervisor (Professor Eleanor Wertheim, (03) 9479 2478, e.wertheim@latrobe.edu.au) or student investigator (Jennifer Nation, Doctoral Candidate, (03) 9479 3073, janation@students.latrobe.edu.au). If you have any complaints or queries that the investigators have not been able to answer to your satisfaction, you may contact the Secretary, Faculty Human Ethics Committee, Faculty of Science, Technology and Engineering, La Trobe University, Victoria 3086 by telephone on (03) 9479 3698 or email: k.collins@latrobe.edu.au. This project has been approved by the Faculty Human Ethics Committee, approval number FHEC13/R97.

Thank you for your interest in finding out more about this study.

Jennifer Nation and Eleanor Wertheim

Student Investigator

Jennifer Nation
Doctoral Candidate
School of Psychological Sciences
(03) 9479 3073
janation@student.latrobe.edu.au

Project Supervisor

Eleanor Wertheim
Professor,
School of Psychological Sciences
(03) 9479 2478
e.wertheim@latrobe.edu.au

Project email address:
learningforgiveness@latrobe.edu.au

Appendix F

Attrition Analyses (Time 1 to Time 2)

Table F1

Independent T-Tests to Compare Completers Versus Non-Completers for Demographic and Continuous Outcome Variables

	Non-completers (n=67)		Completers (n=63)			
Variable	*M*	*SD*	*M*	*SD*	*t*(128)	*p*
Age (years)	45.27	13.66	50.98	13.81	-2.371	0.019
Religiosity	2.03	1.03	2.13	1.16	-0.506	0.613
Trait forgiveness	30.95	7.02	30.68	7.26	0.218	0.828
Empathic concern	4.12	.52	4.31	.56	-1.907	0.059
Perspective taking	3.60	.65	3.82	.67	-1.858	0.065
Extraversion	3.03	.93	2.89	1.03	0.823	0.412
Agreeableness	4.22	.56	4.30	.56	-0.828	0.409
Conscientiousness	3.60	.78	3.84	.78	-1.733	0.085
Neuroticism	3.21	.81	3.13	1.00	0.508	0.612
Openness	3.62	.86	3.64	.98	-0.098	0.922
Time since transgression (months) (SQRT)[a]	66.40	119.66	84.50	106.40	-1.820	0.071
Relationship closeness (SQRT)[a]	7.01	2.34	7.25	2.61	-0.762	0.447
Severity of offence (SQRT)[a]	7.52	2.20	8.16	1.86	-1.732	0.086
Willingness to forgive	7.03	3.09	7.3	3.25	-0.488	0.626
Stress	13.31	4.59	13.21	4.77	0.130	0.896
Anxiety	10.27	3.78	10.13	3.82	0.212	0.832
Depression (Log10)[a]	11.66	4.49	11.38	4.86	0.534	0.594
State forgiveness	44.95	7.85	47.32	10.36	-1.458	0.147
Emotional forgiveness	19.72	5.28	21.68	5.77	-2.029	0.044
Decisional forgiveness	28.16	5.84	31.25	5.61	-3.072	0.003
Avoidance motivation	3.64	0.87	3.37	1.09	1.58	0.116
Revenge motivation SQRT[a]	1.95	0.95	1.58	0.74	2.737	0.007
State empathy	2.10	1.12	2.58	1.40	-2.160	0.033
Rumination	17.70	5.97	17.62	6.81	0.073	0.942

Note: Means and standard deviations are based on mean scale scores; Significance values (*p*) are two-tailed; Levene's Test for Homogeneity of Variance was not violated in any calculations except for neuroticism and state forgiveness, in which cases the values given are for equal variances not assumed.

[a] Transformed variables: Means and standard deviations (and mean difference and 95%CI) are for untransformed values; *T* statistic and significance calculated on transformed values

Table F2

Chi-Square Tests for Independence Calculated to Compare Completers and Non-Completers for Demographic (Categorical) Variables

Variable	Frequency		χ^2	*n*	*p*
	Non-completers (*N*=67)	Completers (*n*=63)			
Gender			.410[a]	130	.719[b]
Male	5	3			
Female	62	60			
Country of residence			.000[a]	130	1.000[b]
Australia	63	60			
Other	4	3			
Ethnicity			.669[a]	130	.413
Anglo-Australian	48	50			
Other	19	13			
Highest completed education			2.679	130	.444
School	14	15			
TAFE	10	11			
Undergraduate university	16	20			
Postgraduate university	27	17			
Religion			4.599	130	.100
None	21	23			
Christian	35	37			
Non-Christian / other	11	3			

Note: Significance values (p) are two tailed;

[a]. χ^2 reported for 2x2 tables is Yates Continuity Correction

[b]. Significance value is derived from Fisher's Exact Probability Test (cell frequencies below 10).

Appendix G

Baseline Analyses Examining Differences Between Conditions at Time 1

Table G1

Independent T-Tests to Compare Immediate Treatment Versus Delayed Treatment Participants for Demographic and Continuous Outcome Variables

	Immediate treatment (IT) (*n*=23)		Delayed treatment / Controls (DT) (*n*=40)		*t*(61)	*p*	Mean Difference	95% Confidence Interval	
Variable	*M*	*SD*	*M*	*SD*				Lower	Upper
Age (years)	46.91	13.03	53.32	13.86	-1.81	.076	-6.41	-13.51	0.69
Religiosity	2.17	1.30	2.10	1.08	0.23	.819	.07	-0.57	0.72
Trait forgiveness	34.13	7.17	28.70	6.12	3.04	.003	5.43	1.86	9.00
Empathic concern	4.41	0.52	4.25	0.58	1.12	.267	0.16	-0.13	0.45
Perspective taking	4.09	0.53	3.66	0.70	2.55	.013	0.43	0.0-	0.76
Extraversion	3.12	1.03	2.76	1.01	1.36	.179	0.36	-0.17	0.90
Agreeableness	4.40	0.50	4.24	0.58	1.09	.281	0.16	-0.13	0.45
Conscientiousness	4.00	0.75	3.75	0.78	1.23	.222	0.25	-0.15	0.65
Neuroticism	3.18	1.00	3.10	1.02	0.32	.750	0.08	-0.44	0.61
Openness	3.90	0.84	3.49	1.03	1.64	.107	0.41	-0.09	0.92
Time since transgression (months)[a]	49.19	73.85	104.81	117.32	-2.45	.017	-55.63	-103.84	-7.41
Relationship closeness[a]	7.09	2.83	7.35	2.51	0.31	.760	-.26	-1.64	1.11
Severity of offence[a]	7.48	1.93	8.55	1.72	2.46	.017	-1.07	-2.01	-0.13

Variable	Immediate treatment (IT) (*n*=23)		Delayed treatment / Controls (DT) (*n*=40)		*t*(61)	*p*	Mean Difference	95% Confidence Interval	
	M	*SD*	*M*	*SD*				Lower	Upper
Willingness to forgive	9.22	1.54	6.20	3.47	4.75	<.001	3.02	1.49	4.55
Days between T1 and T2	20.43	15.90	24.80	14.88	-1.09	.278	-4.36	-12.35	3.62
Stress	13.04	4.77	13.30	4.83	-0.20	.839	-0.26	-2.77	2.26
Anxiety	9.96	3.99	10.22	3.76	-0.27	.791	-0.27	-2.28	1.74
Depression[a]	10.48	4.08	11.90	5.24	-1.18	.242	-1.42	-3.96	1.11
State forgiveness	50.48	8.89	45.50	10.81	1.87	.066	4.98	-0.34	10.29
Emotional forgiveness	22.00	6.13	21.50	5.62	0.32	.743	0.50	-2.54	3.54
Decisional forgiveness	32.56	5.48	30.50	5.62	1.42	.161	2.06	-0.85	4.98
TRIM Avoidance	3.25	0.95	3.43	1.16	-0.62	.537	-0.18	-0.75	0.39
TRIM Revenge[a]	1.43	0.59	1.66	0.82	-1.14	.258	-0.22	-0.58	0.13
State empathy	3.14	1.59	2.25	1.19	2.51	.015	0.88	0.18	1.59
Rumination	16.91	5.71	18.02	7.41	-0.67	.508	-1.11	-4.46	2.23

Note: Means and standard deviations are based on mean scale scores; Significance values (*p*) are two-tailed; Levene's Test for Homogeneity of Variance was not violated in any calculations except for religiosity, willingness to forgive, rumination, time since transgression, relationship value and revenge motivation, in which cases the values given are for equal variances not assumed; TRIM = Transgression Related Interpersonal Motivations.

[a] Transformed variables: Means and standard deviations (and mean difference and 95%CI) are for untransformed values; *T* statistic and significance calculated on transformed values.

Table G2

Chi-Square Tests for Independence Calculated to Compare Completers and Non-Completers for Demographic (Categorical) Variables

Variable	Frequency		χ^2	*n*	*p*
	Immediate Treatment (*n*=23)	Delayed Treatment (*n*=40)			
Gender			0.337[a]	63	.548[b]
Male	2	1			
Female	21	39			
Country			0.247[a]	63	.548[b]
Australia	21	39			
Other	2	1			
Ethnicity			0.238[a]	63	.626
Anglo-Australian	17	33			
Other	6	7			
Highest completed education			6.594	63	.086
School	5	10			
TAFE	1	10			
Undergraduate university	11	9			
Postgraduate university	6	11			
Religion			1.511	63	.470
None	9	14			
Christian	12	25			
Non-Christian / other	2	1			

Note: Significance values (*p*) are two tailed;

[a]. χ^2 reported for 2x2 tables is Yates Continuity Correction

[b]. Significance value is derived from Fisher's Exact Probability Test (cell frequencies below 10)

Appendix H

Correlation Matrix Showing Inter-Relationships Between Potential Covariates and Outcome Variables at Baseline

Variable	Stress	Anxiety	Depression	EFS	DFS	RFS	Revenge	Avoidance	BEA	Rumination
Age	-.24	.03	-.05	.14	.17	.19	-.12	.01	-.03	-.19
Severity	.11	.18	.08	-.16	-.22	-.30*	.16	.43**	-.31*	.26*
Willingness to forgive	.03	.13	-.21	.35**	.30*	.42**	-.20	-.29*	.42**	-.08
Trait forgiveness	-.40**	-.24	-.30*	.37**	.29*	.62**	-.20	-.23	.33**	-.43**
Perspective taking	-.34**	-.20	-.32*	.29*	.32**	.36**	-.24	-.09	.40**	-.10
Time since transgression	-.22	-.03	-.04	.03	.13	-.02	.17	.07	.01	-.03

Note: *N* = 63. Values represent Pearson's product moment correlation coefficients. Columns show outcome variables measured at Time 1; rows show potential covariates. EFS = Emotional Forgiveness Scale; DFS = Decisional Forgiveness Scale; RFS = Rye Forgiveness Scale; BEA = Batson's Empathy Adjectives.

*. $p < .05$ (2-tailed), **. $p < .01$ (2-tailed).

Appendix I

Independent *T*-Tests to Compare Non-Starters Versus Starter Participants for Demographic and Trait Variables, Situation Variables, Outcome Measures, and Social-Cognitive Factors at Time 1

	Did not start REACH (*n*=17)		Started REACH (*n*=62)		*t*(77)	*p*	Mean Difference	95% Confidence Interval	
Variable	*M*	*SD*	*M*	*SD*				Lower	Upper
Demographic and trait variables									
Age in years	47.29	13.38	44.63	13.44	0.72	.471	2.66	-4.66	9.99
Religiosity	1.94	0.90	2.05	1.09	-0.37	.712	-.11	-0.68	0.47
Trait forgiveness	29.00	6.95	32.11	6.86	-1.65	.102	-3.11	-6.86	0.64
Empathic concern	4.17	0.43	4.22	0.58	-0.35	.729	-0.05	-0.35	0.25
Perspective taking	3.54	0.71	3.81	0.65	-1.42	.158	-0.26	-0.62	0.10
Agreeableness	4.13	0.57	4.30	0.56	-1.08	.284	-0.17	-0.47	0.14
Conscientiousness	3.57	0.86	3.74	0.77	-0.78	.439	-0.17	-0.60	0.26
Neuroticism	3.37	1.03	3.22	0.85	0.58	.561	0.14	-0.34	0.62
Situation variables									
Willingness to forgive	6.29	3.31	7.79	2.76	-1.89	.062	-1.50	-3.07	0.08
Relationship closeness	6.65	1.97	7.27	2.56	-0.93	.353	-0.63	-1.96	0.71
Severity of offence	7.47	1.84	7.56	2.15	-0.16	.870	-0.09	-1.23	1.04
Outcome measures at Time 1									
Overall state forgiveness	45.53	6.65	46.61	9.08	-0.46	.648	-1.08	-5.79	3.62
Emotional forgiveness	20.12	3.76	20.31	5.78	-0.16	.873	-0.19	-2.55	2.18

Variable	Did not start REACH (*n*=17)		Started REACH (*n*=62)		*t*(77)	*p*	Mean Difference	95% Confidence Interval	
	M	*SD*	*M*	*SD*				Lower	Upper
Decisional forgiveness	28.41	5.66	29.69	6.31	-0.76	.451	-1.28	-4.65	2.09
Revenge motivation	1.83	0.68	1.82	0.87	.05	.956	0.01	-0.44	0.47
Avoidance motivation	3.60	0.89	3.54	0.92	.27	.786	0.68	-0.43	0.57
State empathy	1.93	1.04	2.44	1.39	-1.42	.158	-0.51	-1.24	0.20
Rumination	16.76	6.31	17.72	5.86	-0.59	.558	-0.96	-4.21	2.29
Stress	14.65	4.86	13.11	4.57	1.21	.230	1.53	-0.99	4.06
Depression	11.59	4.43	11.19	4.25	0.34	.738	0.39	-1.94	2.73
Social-cognitive factors									
Positive offender responses	1.98	0.91	2.02	1.06	-0.11	.913	-0.03	-0.59	0.53
Condoning-related beliefs	2.60	0.84	2.81	1.08	-0.75	.455	-0.21	-0.78	0.35
Relationship value	3.06	1.09	3.01	1.26	0.14	.887	0.05	-0.62	0.72
Spiritual beliefs	2.57	1.40	3.00	1.39	-1.14	.257	-0.44	-1.20	0.32
Social influence	3.02	1.22	2.80	1.11	0.70	.483	0.22	-0.40	0.84
Unlikely to re-offend	2.16	0.54	1.87	0.74	1.49	.140	0.29	-0.10	0.67
Non-malicious intent	2.54	0.91	2.36	1.03	0.67	.502	0.18	-0.36	0.73
Humility	3.35	0.69	3.42	0.86	-0.29	.771	-0.06	-0.52	0.38
Empathic responses	2.85	0.76	2.93	0.88	-0.35	.726	-0.08	-0.55	0.38

Note: Means and standard deviations are based on mean scale scores; Significance values (*p*) are two-tailed; Levene's Test for Homogeneity of Variance was not violated in any calculations except for Emotional forgiveness, in which case the values given are for equal variances not assumed.