Forgiveness in Two Minds: Understanding Forgiveness Through Dual-Process Theory

by

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Abstract

In this thesis, I examined the relevance of dual-process theory to understanding forgiveness. Specifically, I argued that the internal conflict experienced by laypersons when forgiving (or finding themselves unable to forgive) and the discrepancies between existing definitions of forgiveness can currently be best understood through the lens of dual-process theory. Dual-process theory holds that individuals engage in two broad forms of mental processing corresponding to two systems, here referred to as System 1 and System 2. System 1 processing is automatic, unconscious, and operates through learned associations and heuristics. System 2 processing is effortful, conscious, and operates through rule-based and hypothetical thinking. Different definitions of forgiveness amongst both lay persons and scholars may reflect different processes within each system. Further, lay experiences with internal conflict concerning forgiveness may frequently result from processes within each system leading to different cognitive, affective, and behavioural responses. The study conducted for this thesis tested the hypotheses that processing within System 1 can directly affect one’s likelihood to forgive, and that this effect is moderated by System 2 processing. I used subliminal conditioning to manipulate System 1 processing by creating positive or negative conditioned attitudes towards a hypothetical transgressor. I used working memory load (WML) to inhibit System 2 processing amongst half of the participants. The conditioning phase of the study failed and so no conclusions could be drawn regarding the roles of System 1 and System 2 in forgiveness. The implications of dual-process theory for forgiveness research and clinical practice, and directions for future research are discussed.
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Introduction

Lay experiences with and definitions of forgiveness are many and varied. It is therefore not surprising that these definitions are often in conflict with each other and with the definitions of scholars (see below for review). Moreover, lay persons’ experiences with forgiveness often involve some degree of internal conflict. I will here argue that these experiences and definitions may be better understood through the lens of dual-process theory. Dual-process theory holds that individuals engage in two broad forms of mental processing corresponding to two systems: one that is automatic, unconscious, and operates through learned associations and heuristics, and a second that is effortful, conscious, and operates through rule-based and hypothetical thinking. The study described in this report attempted to test the hypothesis that processing within the prior system can directly affect one’s likelihood to forgive, and that this effect is regulated by the latter system.

For my Introduction, I shall begin by reviewing both professional and lay definitions of forgiveness. These definitions will then be related to lay experiences with internal conflict when forgiving or not forgiving. I will then provide an overview of dual-process theory and how it may help to account for this conflict. Reviews of how the two systems of dual-process theory interact, and dual-process theory’s treatment of affect will then be provided. Next I will discuss further applications of dual-process theory to forgiveness, before illustrating the potential roles of each system in forgiveness. I will then summarize the most prominent models of forgiveness in the literature, and indicate where aspects of dual-process theory can be found within these models, and which of
these aspects are never addressed by the models. Finally I will explain the reasoning that led to the design of my study.

**Disagreement and Internal Conflict Concerning Forgiveness**

**Defining forgiveness.** What is forgiveness? Is it a feeling, a behaviour, or a decision we make? If I am to say “I forgive you” does that mean I have forgiven? There is currently considerable disagreement amongst psychologists and other scholars concerning the definition of forgiveness (Enright, Eastin, Golden, & Sarinopoulos, 1992; McCullough, Pargament, & Thoresen, 2000; Rye et al., 2001). Two of the most prominent definitions place the core of forgiveness in different constructs, Enright and his colleagues claiming that forgiveness is a change in cognition, affect, and behaviour (Enright, 1996; Enright, Freedman, & Rique, 1998; Enright & The Human Development Study Group, 1991), and McCullough and his colleagues claiming that forgiveness is a change in motivations (McCullough et al., 1998; McCullough & Hoyt, 2002; McCullough, Root, & Cohen, 2006; McCullough, Worthington, & Rachal, 1997). One may further question whether forgiveness can be just cognitive, just affective, or just behavioural, or if it must be some combination thereof.

A third point of contention is whether or not forgiveness merely requires that an individual cease to hold negative attitudes towards the offending party, as is argued by some scholars (e.g., Thompson et al., 2005), or if one must also build positive thoughts, feelings, behaviours in their place, as is suggested by Enright et al. (1991). Yet another question left unanswered is whether or not forgiveness is a conscious choice or a gradual process that occurs regardless of one’s will. These examples represent just some of the discrepancies amongst scholars’ definitions of forgiveness that remain unresolved.
Beyond disagreement amongst scholars, recent research has illustrated a gap between forgiveness as conceived of in the scientific literature and forgiveness as perceived by lay persons (DeCourville, Belicki, & Green, 2008; Kanz, 2000; Mullet, Girard, & Bakhshi, 2004; Stewart, DeCourville, & Belicki, 2010; Younger, Piferi, Jobe, & Lawler, 2004; Zechmeister & Romero, 2002). Lay persons’ definitions of forgiveness reflect an even broader range of perspectives, and may include concepts such as reconciliation, excusing, and forgetting (DeCourville et al. 2008; Kanz, 2000; Stewart et al., 2010), each of which have been widely excluded from the definition of forgiveness by academics (e.g. Enright et al., 1991; 1992; 1998; Exline & Baumeister, 2000; McCullough, 2001; North 1987; Thompson & Snyder, 2004; Witvliet, 2001; Worthington, 2005; Worthington et al., 2007).

DeCourville et al.’s (2008) study exploring lay definitions of forgiveness in a community sample illustrated many complex conceptions of forgiveness held by lay people that could converge or depart from expert opinions on topics such as the role of choice, the release of negative emotions, and the extent to which forgiveness is intrapersonal or interpersonal. Moreover, during the interviews referred to in this study, multiple participants explicitly stated that forgiveness had different meanings for them in different contexts (K. Belicki, personal communication, July 22, 2011). Therefore, it is clear that the word forgiveness is used to mean many different things.

Each individual’s concept of forgiveness may include many different processes, each of which may occur simultaneously or in isolation, and which may be more or less relevant to the individual’s perception of forgiveness in different situations. In order to understand what both lay persons and scholars wish to communicate when they say...
"forgiveness" we must have a better understanding of the types of processes that underlie multiple conceptions of forgiveness, and whether or not these processes always occur together.

**Conflict amongst forgiveness processes.** The relative independence of the various processes that may be included in one’s definition of forgiveness is evident in lay persons’ definitions and actual experiences with forgiveness, which appear to be more fragmented and variable than what is represented by the works of scholars. For example, Enright and his co-authors (1992) depict forgiveness as a congruent whole in which cognitive, affective, and behavioural components are in synchrony with the offended party’s expression of whether or not they forgive. We see this in their assertion that forgiveness is a cognitive decision leading to “a change of heart” allowing the forgiver to enter into “loving community with others,” as this assertion suggests that each component consistently gives way to the next. These three components of forgiveness reflect the common tripartite division of attitudes in which attitudes are also said to have cognitive, affective, and behavioural components (e.g. Rosenberg & Hovland, 1960).

It should be noted that Enright’s understanding of these processes is not entirely rigid; in 1996 he wrote:

> We do not imply that an offender is not receiving forgiveness until all six psychological components are completely given--cessation of negative affect, cognition, and behavior and the initiation of positive affect, cognition, and behavior. A forgiver may offer some degree of them with a commitment to at least cease the negatives. (Receiving Forgiveness, para. 1)

However, his claim here is that an individual only needs to experience a moderate change, rather than a complete change, in each component (cognition, affect, and behaviour) to have truly forgiven, not that a change in some but not other components can be considered true forgiveness. Enright’s use of the word “them” in this passage
binds these cognitive, affective, and behavioural components together, implying that each would happen in unison. This is indeed what we might expect if, as Enright contends (Enright, 1996; Enright et al., 1991; 1992), forgiveness is a choice and, therefore, each of these components share a single decisive origin; the will of the forgiver. However, this does not appear to be how many lay people actually experience forgiveness.

Several recent studies have found that forgiveness is often conceptualized or experienced as existing despite residual anger, continuing resentment, and a lack of positive affect (DeCourville et al. 2008; Kanz, 2000; Mullet et al. 2004; Stewart, et al., 2010; Zechmeister & Romero, 2002). For example, 76% of participants in Kanz’s (2000) study answered “yes” to the question “is it possible to be both angry and forgiving about a situation at the same time?” Mullet et al. (2004) obtained similar findings in a study using exploratory and confirmatory factor analyses with a large sample size ($N = 1029$) to examine lay conceptions of forgiveness. Participants indicated substantial disagreement with the “change of heart” factor, with a mean score of 7.16 out of 17 on the four corresponding items (in which higher scores indicated agreement).

Stewart et al. (2010) have provided a detailed examination of laypeople’s experiences with forgiveness using Q methodology. Q methodology is a research method that explores subjective viewpoints using a unique form of factor analysis in which factors are comprised of groupings of people who have sorted items similarly. Here participants were asked to sort 66 statements about forgiveness to indicate the extent to which each statement represented their experiences with forgiveness on a scale of -5 to +5. Participants’ experiences with forgiveness yielded three factors, titled “Unresolved Forgiveness,” “Compassionate Forgiveness,” and “Forgiveness Motivated by Religious
Belief.” Unresolved Forgiveness represented the experiences of the largest portion of participants (11 of the 21 who loaded on a single factor) and is characterized by strong agreement with such statements as “I forgave the person who hurt me, but I still have negative feelings about him/her” and strong disagreement with statements like “forgiving the person who hurt me meant trusting them again” and “now that I have forgiven the person who hurt me, I feel good about him/her – just as good as I felt before s/he hurt me.”

It is clear that these participants did not experience the affective transformation that is so prominent in the literature. Moreover, participants defining the other two factors found the statement “forgiving the person who hurt me meant that I no longer felt anger or resentment” irrelevant to their experience with forgiveness. Participants in the Unresolved Forgiveness factor also had a mean score of -1, on the scale described above from -5 to +5, for the item “now that I have forgiven the person who hurt me, I treat him/her just as well as I did before s/he hurt me.” This indicated that the behavioural component of forgiveness was largely absent for these participants as well.

DeCourville et al.’s (2008) research has similarly shown that the layperson’s forgiveness may refer to an idea, an action, or a decision, all of which may be independent of their affective response to thoughts of the transgressor. For others, it may be a spontaneous change in affect that is only afterwards recognized cognitively. For example, one participant claimed, “I was driving to work one morning and I went ‘Ohh, [sic] I think I’ve forgiven him.’ I really do, and it was like a weight lifted off me. I knew I’d forgiven him.” (DeCourville et al., 2008, pg. 9). This conception of forgiveness occurring at the affective level without a cognitive component is reflected again in
Brenneis's (2002) study of forgiveness amongst clergy who felt interpersonally hurt by a superior who had required them to enter residential psychological treatment. When asked to define what forgiveness meant to them only 3 of the 88 participants in this unique sample mentioned a cognitive component, the majority choosing to focus on emotional change instead. Further, only one participant mentioned a behavioural change.

It is interesting to note that some lay persons apparently agree with Enright and his associates' opinion that each of the processes underlying forgiveness should always occur in synchrony, despite their experiences with forgiveness. Although there has been no systematic study of laypersons' opinions on whether or not forgiveness refers to multiple processes, some individuals in the DeCourville et al. (2008) study reported being troubled by the experience of believing that they had forgiven only to discover that they still felt anger about the offense (K. Belicki, personal communication, September 2010).

Similarly, it is common for offenders to express frustration when, after being told that they have been forgiven, the injured party repeatedly brings the offense back into their conversations. These accounts suggest that if psychologists succeed in teaching that authentic forgiveness means no longer experiencing conflicting thoughts or feelings about the transgressor, then those who would ordinarily be untroubled by this internal conflict may become frustrated that their own or others' attempts at forgiveness fall short.

In conclusion, the definitions of forgiveness and experiences with forgiveness that lay persons have reported in recent studies involve a broad range of processes; however, no single process is found in all definitions or experiences. This suggests that these processes may be considered independent, and thus are able to occur in the absence of one another.
If we are to accept that these findings are accurate we are left with a few choices of how to interpret them. First we might claim that the forgiveness experienced by these participants was incomplete, or fragmented. This way of categorizing such experiences with forgiveness is reflected in Stewart et al.'s (2010) choice of the name “Unresolved Forgiveness” for the factor in her study that was constituted by participants who believed they had forgiven but continued to experience negative emotions about the offender. This way of understanding such experiences is also reflected in the use of the term “incomplete” by Enright and his colleagues (1992) in reference to theories that did not include a change in affect, accurate cognitive evaluation, or a clear choice. Alternatively we could take the stance that one of these processes is “true” forgiveness and that the rest are merely correlates that are at times confused with forgiveness. Worthingon et al. (2007) seem to take this stance when they claim “many acts reduce unforgiveness and are thus often confused with forgiveness” (pg. 2).

Finally we could view each process as a different form of forgiveness, each equally valid. Worthington et al. (2007) supply a compelling example of this view when they write “making a decision to change one’s behavior could be a sincere and permanent form of forgiving, and yet that decision must be differentiated from emotionally forgiving. Decisional and emotional forgiveness are different processes, likely with different sequelae” (p. 292). Although this third option is the most inclusive of lay perspectives, the definitional debate has been driven by scholars’ claim that there is but a single concept that ought to be called “true forgiveness.” This claim has been particularly apparent in the writing of Enright and his colleagues who frequently set aside a section in their papers and books specifically dedicated to calling out definitions of forgiveness that
the authors deem incorrect (e.g. Enright et al., 1991; 1992). This critique is similarly applied to the forgiveness claims of laypersons. Enright and his colleagues (1992) write of one client described in a case study by Forward (1989; cited in Enright et al., 1992): “we must realize that it is not forgiveness that complicated Stephanie’s life, but her distortion of what forgiveness is” (Works Discouraging Forgiveness, para. 3).

Although decisions regarding the correct definition of forgiveness and how we communicate about these definitions may have real world consequences for researchers and clinicians (see the Discussion), it is not the purpose of the current paper to take a strong stance on how forgiveness should be defined or if it should have a single definition at all. Before scholars can make fully informed decisions regarding the definition of forgiveness they must understand the potential underlying processes and be able to discuss them with colleagues and participants. It is the purpose of the current work to investigate what types of processes may be involved in both what scholars refer to as forgiveness, and in what lay persons refer to as forgiveness. In doing so we may provide critical insight into what lies beneath the definitional debate, begin to form a more precise language for discussing the construct, and gain a better understanding of common experiences, whether or not they are truly forgiveness.

If we are to better understand the types of processes that may be included in forgiveness and how they coexist it may be wise to take a step back from forgiveness research and ask how mental processes have commonly been classified in general. What we can see from a distance is a common pattern of two types of processes that have been found to underlie nearly every aspect of human psychology. This way of classifying
processes and the expansive literature that accompanies it has become known as dual-process theory.

**Dual-Process Theories**

Most people think of themselves as having a single mind that embodies their identity. When one says the word “I” it is thought to refer to something that is clearly singular. Dual-process theory, however, provides us with a very different account. At its most basic, dual-process theory simply puts forth that an individual mind is made up of more than one process or system; the number need not matter (Gilbert, 1999).

Nonetheless, there is a general consensus amongst a diverse set of dual-process theorists regarding the existence of two distinct systems. The first system operates quickly, effortlessly, and largely outside one’s awareness. The second system operates slowly at the conscious level using rule-based reasoning (such as logic) and hypothetical thinking.

The systems have been described as implicit and explicit (Reber, 1993), heuristic and systematic (Chaiken, 1980), heuristic and analytic (Evans, 1984), associative and rule-based (Sloman, 1996), associative and propositional (Gawronski & Bodenhausen, 2006), hot and cool (Metcalfe and Mischel 1999), Type 1 and Type 2 (Evans & Wason, 1976; Evans 1980), and affective and cognitive (Shiv & Fedorikhin, 1999), each model emphasising different aspects of the two systems and applications for our understanding of them. In the interest of neutrality, I will follow the example of Stanovich (1999) and refer to the prior system as “System 1” and the latter as “System 2”.

Dual-process theories have now been developed to explain a diverse set of phenomena including learning (e.g., Reber, 1993), reasoning (e.g., Evans & Wason 1976; Evans 1980), self-regulation (e.g., Baumeister & Heatherton, 1996; Metcalfe & Mischel,
1999), persuasion (e.g., Chaiken, 1980), emotion (e.g., Smith & Neumann, 2005), memory (e.g., Smith & DeCoster, 2000), and personality (e.g., Epstein, 1998). Reviews of dual-process theories focusing on social psychology, and reasoning, are provided by Chaiken and Trope (1999) and Evans (2003) respectively\(^1\). The range of applications for dual-process theory is so diverse that it may be appropriate to imagine that a dual-process model may exist for every major function of the human brain. It is natural to perceive conscious thinking, or System 2 processing, as the entirety of the human mind. However, if dual-process theory is as ubiquitous as the range of these models implies, then one cannot relegate System 1 to a few isolated processes. System 2 processing can be no more whole than System 1 processing, and so System 1 may be equally deserving of the term “mind.” It is therefore appropriate that researchers like Evans (2003; Evans & Frankish, 2009a) and Stanovich (1999; 2004) have come to refer to dual-process theory as a theory of two minds.

Part of what makes the sheer number of dual-process theories so impressive, is that a large proportion of them were developed independently, without knowledge of previous dual-process theories (Evans & Frankish, 2009a, 2009b). This aspect of the development of dual-process theories can be seen as a parallel to high inter-rater reliability amongst judges that are blind to each other’s ratings and the hypotheses of the study for which the ratings are being made. This is because so many dual-process theorists have interpreted their data in the same way without the motivation to fit their data to a pre-existing dual-process theory. Researchers like Evans (2003; Evans & Frankish, 2009a; Evans & Over 1996) and Stanovich (1999; 2004) have worked to

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\(^1\) It should also be noted that at least one single-process model has been offered as an alternative (Kruglanski, Thompson & Spiegel, 1999).
organize these commonalities amongst dual-process theories into over-arching dual-system theories (although the use of the term "systems" instead of "processes" predates these works, and the two terms can be used interchangeably; e.g., Reber, 1993; Sloman 1996). With this idea in mind I find it most appropriate to relate forgiveness to the broader and most commonly shared principles of dual-process theory rather than to focus on a single dual-process theory.

System 1 processing is thought to be evolutionarily older, shared with other species down the phylogenetic scale, whereas System 2 processing is considered uniquely human. As such, each system is believed to be adapted to achieve separate goals. System 1 processing is thought to act under "short leash" control by the genes; it directs specific responses based on specific stimuli in accordance with what has led to the survival and proliferation of genes in the past (Stanovich 2004). System 1 itself can be split into many independent subsystems, referred to as The Autonomous Set of Systems (TASS), each of which evolved to serve domain specific needs of genetic proliferation (Stanovich, 2004). Thus, System 1 processing includes instinctive behaviour, and more broadly, processes of association facilitated by an associative network, which may be likened to neural networks (Sloman, 1996) allowing System 1 to learn from past success or failure.

This specificity allows the functioning of System 1 to be closely tied to genetic proliferation, however, it is unable to create new adaptive responses to new situations. This is because, by definition, neither the individual nor past generations would have had past experience with this situation through which they could derive an appropriate response to this stimulus, generally achieved either by forming an association or through natural selection. System 2 processing is thought to have developed to amend this. Rather
than relying on a supply of specific responses, System 2 processing is capable of using rules (in the form of “if x then y”), logic, and hypothetical thinking to create new solutions to novel problems. For this it requires more resources, such as glucose, working memory, and time, as compared to System 1 processing. For this reason, System 1 is thought to act as the default system until an occasion arises in which System 2 processing must intervene (e.g., Chen & Chaiken, 1999; Reber, 2003; Stanovich, 2004).

In many dual-process theories System 2 is responsible for executive functioning, and acts to inhibit System 1 responses when they are considered inappropriate (e.g. De Neys, 2006; Metcalfe & Mischel, 1999; Pollock, 1991; Stanovich, 1999; Stanovich & West, 2000). Because System 2 processing does not work with a set of specific responses previously established by evolution and experience, it is more likely to implement goals that are unrelated to genetic proliferation. System 2 processing may therefore enact goals that benefit, not genes, but what Dawkins (1976) refers to as their “vehicles”: ourselves as wholes.

In discussing forgiveness I have reviewed discrepancies amongst definitions of forgiveness, and have taken note of how various processes thought to underlie forgiveness are often experienced as conflicting, an experience that is not well explained in the existing literature. Dual-process theories have traditionally been posited to explain such internal conflict (see Evans & Frankish, 2009b). As such, the presence of internal conflict regarding forgiveness is the primary piece of evidence that has motivated this thesis. How dual-process theory may help to explain internal conflict in forgiveness and how it relates to disagreement about the definition of forgiveness can be illustrated by dual-process theory’s contribution to another debate in cognitive science.
There is evidence in hundreds of experiments that in certain reasoning tasks the majority of individuals will fail to choose what is determined by normative models to be the correct answer. A well-known example is Wason’s (1966) selection task. Many variations of this task now exist; however, in its original form, participants are presented with an array of cards, each with a number on one side and a letter on the other. One side of each card is plainly visible. Participants are told that their task is to indicate which cards they would need to turn over in order to determine the veracity of the following statement: “if a card has a vowel on one side then it has an even number on the other side” (Wason, 1966, p. 146). The correct answer to this problem is any card with a vowel facing up, and any card with an odd number facing up, but no others, because only these cards can disprove the rule. However, the majority of participants in Wason’s (1966) study selected cards displaying vowels, and cards displaying even numbers. In replications of Wason’s selection task, typically, less than 10% of participants selected the correct answer (see Stanovich, 1999 or Stanovich & West, 2000, for a review of replications and interpretations of these findings).

Findings such as these have stirred debate about human rationality (Evans, 1984; Stanovich & West, 2000). These poorer performances seemed particularly anomalous considering that the individuals who participate in these studies largely consisted of university students, often from prestigious institutions such as Princeton and Stanford University. Cognitive psychology had essentially demonstrated that “an awful lot of pretty smart people are doing some incredibly dumb things” (Stanovich, 2004, p. 149).

Dual-process theory has offered a solution to this enigma by positing two minds, each capable of two levels of analysis, in one individual. The first level of analysis is the
algorithmic level. Algorithmic level cognitive capacities include perceptual speed, discrimination accuracy, working memory capacity, and other similar abilities. The second level of analysis, intentional level, is more broadly concerned with goals, beliefs, and how one chooses to behave based on these goals and beliefs. Individual differences in intelligence are largely attributable to individual differences in algorithmic level cognitive capacity within System 2 (individual differences in algorithmic level cognitive capacity within System 1 are largely absent).

Rationality, however, can be considered more closely concerned with the thinking dispositions that may lead an individual to hold different goals and beliefs, and to make appropriate decisions at the intentional level of analysis. Given that the goals existing at the intentional level of System 1 may differ from those of System 2, and because they are assumed to be more closely tied to the proliferation of genetic material and the environment of evolutionary adaptiveness (EEA) than reflective desires in the world of today, the behaviour they generate may be inappropriate or irrational. In these situations an individual must use System 2 processing to override System 1 processing at the intentional level. Some thinking dispositions (at the intentional level of System 2) may lead an individual to be more likely to override inappropriate behaviours initiated by System 1 (e.g. high need for cognition), whereas others will not.

Thus, the mystery of “smart people acting dumb” quickly unravels. High intelligence (high algorithmic level cognitive capacity in System 2) allows an individual the potential to derive rational decisions and overcome inappropriate impulses, however, only those who are also in the habit of reflecting on and overriding inappropriate goals, beliefs, and actions rooted in System 1 will also behave rationally.
Turning back to forgiveness, an explanation that may be provided by a dual-process outlook is that the incongruent thoughts and feelings described above are largely produced by, or originate from, separate systems. An individual who is intelligent but behaves irrationally is a paradox as long as one holds the perspective that the terms ‘intelligence’ and ‘rationality’ refer to the same construct. Similarly, an individual who believes that multiple independent processes are a part of the same forgiveness may be surprised when these processes do not co-occur. If one can refer to each of these processes separately, and recognize that they may have separate antecedents, the confusion dissipates.

Thus, by taking a dual-process perspective we can create an understanding of forgiveness that more closely reflects lay experiences of forgiveness as compared to Enright and colleagues’ (1991) depiction of forgiveness in which all processes coincide. Again, this need not replace a scholarly definition of what psychologists consider “true” forgiveness, but may act as a model of what researchers may expect lay people to refer to when asked about forgiveness.

This explanation of incongruence within forgiveness that is provided by dual-process theory is just one example of how dual-process theory may be of use in research on forgiveness. In order to more fully understand how the study of forgiveness can benefit from dual-process theory it is necessary to first review several aspects of dual-process theory.

The Relationship Between System 1 and System 2

Gilbert (1999) has illustrated four of the most common ways the two systems are thought to interact in dual-process theories, using the metaphor of how one might design
a machine (specifically, he uses the example of a soda machine). In “selective designs”, processes from different systems are triggered by different stimuli, such that processing within only a single system becomes active, and determines a response. Alternatively, “competitive designs” postulate that processing within both systems is triggered, but only one System’s processing succeeds in determining the outcome. Selective designs are more popular than competitive designs amongst the dual-process theories of social psychologists, as social psychologists tend to be more interested in behaviour and its cause than mental events with no behavioural outcome (as would be the activity of the “losing” system in a competitive design). The opposite is true for the dual-process theories of cognitive psychologists.

Unlike selective and competitive designs, “consolidative” and “corrective designs” afford processing within both systems some input on any outcome. In consolidative designs, processes within both systems respond simultaneously to a stimulus and the results of these processes are integrated. Finally, in corrective designs, processing within a single system may initially become activated; however if the response it generates appears to be deficient, processing within the second system may correct, or otherwise modify it. Thus, rather than working independently, in a corrective design processing within one system monitors and reacts to the responses of the other. Recall that some dual-process theories posit that System 2 processing acts as a central executive that inhibits inappropriate System 1 responses (e.g. De Neys, 2006; Metcalfe & Mischel, 1999; Pollock, 1991; Stanovich, 1999; Stanovich & West, 2000). These dual-process theories use or draw upon corrective designs.
Although these are the most commonly proposed models, there are many more ways the two systems could interact, and an infinite number of variations on these designs could be devised. I have tested the corrective design in the present study, not because this design typifies dual-process theories (although it is common amongst many of the most prominent dual-process theories of social psychologists, e.g., Devine, 1989), but because it is this design which I was capable of testing with the available methods. Specifically, I have attempted to test whether System 1 processing can have direct effects on forgiveness, and if System 2 processing can moderate these effects. However evidence for this corrective design will not preclude the possibility that System 2 processing may also have direct effects. It is possible that the actual nature of the mind resembles a blend of corrective and competitive, or corrective and consolidative designs.

Of further interest is that the output of one system can become the input of the other system. That is to say, the decisions, beliefs, or behaviours that result from processing within one system can act as stimuli for processing within the other. Once the output of the prior system is processed by the latter, the latter may come to produce the same or similar output on its own. System 1 processing can come to give responses previously supplied by System 2 processing when a task that was learned through effortful processing is practiced until it becomes automatic (Stanovich, 2004).

Stanovich (2004) has provided a demonstration of the strength of this process of automatisation through use of the Stroop Task. In this task the names of several different colours (e.g. "BLUE") are written in different colours than that which is named (e.g. "BLUE" written in red ink). Participants are instructed to state the colours that the words are printed in rather than the colours that the words spell, and to do so as fast as they can.
Despite understanding the instructions, participants have difficulty naming the colours rather than reading the words. Reading, once learned and practiced through conscious control, has become so automatic and autonomous that we cannot keep it from interfering with competing tasks once triggered.

System 2 processing can also come to produce responses that were once provided by System 1 processing. System 2 processing works to weave perceptions, thoughts, and memories into a cohesive narrative. It is a story teller placing itself (or yourself) at center stage. This may provide us with a sense of order and control, but as System 2 processes search for meaning and causation where there is none, they are liable to fill in these gaps with false information in a phenomenon called confabulation (Evans & Wason, 1976; Gazzaniga, 1998; Nisbett & Wilson, 1977).

A vivid example of confabulation has been provided by the work of Gazzaniga (1998) with split-brain patients. Split-brain patients have had their corpus callosum cut such that the left and right sides of the brain can no longer communicate with each other. The brain functions contra laterally with the body; the left side of the brain controls the right arm and receives input from right visual field, whereas the right side of the brain controls the left arm and receives input from the left visual field. In the vast majority of cases the left side of the brain can process language whereas the right cannot. The left hemisphere of the brain of a patient was presented with a picture of a chicken foot, and the right hemisphere was presented with a picture of a snowstorm. When asked to choose the corresponding picture from a set of four the left hand pointed to a picture of a chicken and the right hand pointed to a picture of a shovel.
What is of interest to this paper is what happened when the patient’s left hemisphere (the hemisphere that could speak), was asked to explain the behaviour of the left hand, information the left hemisphere could not possibly know. Without hesitation the left hemisphere responded that the shovel was to clean out the chicken coup. A similar occurrence is thought to happen between the two systems. Rather than the left brain mistaking the actions of the right for its own, System 2 processing will see itself as the cause of behaviour that is actually driven by System 1 processing, and create explanations for such behaviour that are consistent with this perception. Once System 2 processing has created reasons for behaviour originally driven by System 1 processing, System 2 processing may continue to instantiate such behaviour even after System 1 processing has ceased to do so. In addition to physical behaviour, confabulation may be used to explain mental activities such as holding beliefs and having preferences.

Output from System 1 processing may also act as a stimulus for System 2 processing in the form of consciously recognized automatic thoughts or “gut feelings” (Stanovich, 2004). We can become aware of thoughts or feelings that were created through System 1 processing. These thoughts and feelings may then be taken into account in System 2 processing. For example, an individual who associates a potential mate with an unpleasant gut-feeling is likely to deduce that they should not date that person because one generally prefers to spend time with people who elicit pleasant feelings. Further, at times System 1 processing may provide information that is not directly available to System 2 processing. A student who can’t explicitly remember which hallway leads to the classroom may have a better chance of finding the classroom by choosing the hallway that merely looks familiar.
It is important to understand that System 2 processing most likely never determines behaviour without some input from System 1 processing. System 1 processing is responsible for such a broad range of functions, from face recognition, to grammar acquisition, to social inferences, that the majority of System 2 processes require some input from System 1 processing. Take, for example, a university student attempting to determine the validity of a written syllogism. Although the formal logic of System 2 processing is required to solve the problem, first System 1 processing would be used to read the problem, and perhaps even to determine the intentions of the teacher, or researcher, who presented the problem. These automatic processes would therefore determine much of the meaning and context assigned to the problem. In everyday life, which is much more saturated with the need to interpret social cues and determine the strength of personal preferences, the role of System 2 processing would be less clear, and one can be expected to rely more heavily on System 1 processes.

This complex interplay between the two systems' processes may pose challenges for researchers wishing to distinguish which system's processing is responsible for a specific "real world" thought, feeling, or behaviour. This is of consequence to how one may investigate dual-process theory and so I will return to this subject as I discuss the design of the proposed study.

**Dual-Process Theories and Emotion**

Earlier I put forward the hypothesis that the incongruence between cognition, affect, and behaviour related to forgiveness that is experienced by lay people may be a manifestation of incongruence between conclusions reached by System 1 and System 2 processing. Lay people, not having the vocabulary or knowledge of the two systems may
have no other way of communicating this incongruence than to express it in terms of conflicting thoughts, feelings, and behaviours. The most common form of conflict noted in my review was a conflict between affect and cognition. My argument is strengthened by the fact that conflict between processes within each of the two systems is particularly likely to be expressed this way. This is because the output of each system is differentially likely to be expressed as cognition versus emotion or affect. It must be kept in mind, however, that it is not my contention that incongruence between System 1 and System 2 processing is always expressed as incongruence between affect and cognition, or that incongruence between affect and cognition always indicates incongruence between the two systems’ processes.

At times an incongruence between processes originating from each of the two systems may manifest as an incongruence between two thoughts, as in the case of an individual struggling between using a heuristic and using logical deduction, and at other times as competing or mixed emotions. Still another option is that an individual may think or feel one way, but behave another. However, competing impulses within the same mode, that is to say between two thoughts or two feelings, may be dismissed as “uncertainty” or recorded as moderate ratings on scales. Differences between cognition and affect, however, have already become apparent in the literature. Incongruence between cognition and affect or emotion may therefore serve as a starting point for connecting dual-process theory and forgiveness. Future research may seek to illuminate the many ways in which competition between System 1 and System 2 processing may manifest.
Although some dual-process theories place affect and emotion clearly in System 1 (e.g. Epstein, 1998; Metcalfe & Mischel, 1999; Shiv & Fedorikhin, 1999), this is not the only treatment of emotion by dual-process theories. Numerous dual-process theories of emotion exist that draw the line between the two systems across the center of emotion, such that emotion itself is a product of two systems (see Smith & Neumann, 2005 for review). Examining a few of these theories may allow insight into the origin and role of emotion in dual-process theories in general.

Some dual-process theories of emotion place simple, "basic," or "primordial" emotions in the realm of the automatic, the equivalent of System 1 processing (though they do not use this language), whereas more complex, "elaborated," or "uniquely human" emotions are thought to require a conscious or controlled (System 2) component (Johnson-Laird & Oatley, 1992; Keltner & Haidt, 2001). In Keltner and Haidt's (2001) theory of primordial versus elaborated emotions, elaborated emotions refer not only to the experience of emotions themselves, but to the meaning, behaviours, and norms associated with them through culture. This conception of emotion seems to leave much of the core experience of emotion in System 1 processing.

Similarly, Johnson-Laird and Oatley's (1992) theory of basic emotion posits six basic emotions elicited by "rapid and coarse cognitive evaluations" (p. 209) that prepare an individual physiologically, and that communicate socially. More complex emotions are simply the combination of basic emotions and culturally specific cognitive evaluations, such as recognizing the cause of the basic emotion, or its social connotation. The theory holds that basic emotions act independent of reasoning, but instead bridge the gap between rational thinking and automatic, or reflexive, action by predisposing an
individual towards what would otherwise be reflexive action, without completely undermining rational decision making. Thus, I would argue that emotion as described by this theory falls in the realm of System 1 processing. It is important to note that although this description is similar to Stanovich’s (2004) explanation of “gut feelings,” Johnson-Laird and Oatley contend that the role of emotions is one of control, rather than communication between the systems. Specifically, emotions in their theory do not exist so that an individual who is engaging in System 2 analytic thinking may take this information into account, but to directly prime the corresponding behaviour. This is a function of emotion that is also accepted by Stanovich (2004).

In their interactional model of emotion, Ochsner and Barrett (2001; Barrett et al., 2007) describe emotion as an interaction between simple, non-conscious, automatic processes, and conscious, controlled processes. Automatic processes detect the presence of threats and rewards creating “core affect” with a positive or negative valence. Automatic processing will then apply knowledge about the affect’s meaning and causation to create an emotion. This emotion is only experienced consciously, however, once controlled processes attend to this emotion, and create a label for it. Top down or controlled processes may also regulate emotion, and determine if a change in behaviour needs to be made.

In their dual-process model of emotion, Smith and Neumann (2005) build on previous dual-process theories of emotion by suggesting that after repeated pairings of an emotion with a stimulus, if any aspect of an emotion is cued, whether it be a physiological reaction, a subjective experience, or a cognitive appraisal, each of the other aspects will also become activated through the associative network. They argue that
System 2 processing may be used to attempt to reinterpret the stimulus or redirect attention; however, the speed of System 1 processing may render the controlled cognitive system unable to intervene once activation has begun. Over time, however, System 2 processing may repeatedly pair the stimulus with a different affective response, effectively creating conditioned responses through System 1. The authors suggest that emotions that originate in System 2 processing may be more easily extinguished by processing within System 2 when it is rationally understood that the emotion is no longer appropriate.

Consistent across these theories is that emotion requires an automatic component. Further, System 1 processing appears to play a more fundamental role in creating the emotional experience in and of itself, whereas System 2 processing is more commonly responsible for informing, provoking, and articulating emotion, to create a more nuanced experience. I would argue that much of the System 2 component described by these authors is not emotion in and of itself, but the behaviours and thoughts that typically accompany emotions. Although some theories emphasize the importance of cognitive processes, or what I would identify as System 2 processes, in creating the experience of emotion (e.g. Ochsner & Barrett, 2001), these accounts nonetheless appear to place System 2 processes in a less basic role, often taking place chronologically later. For the purposes of the current study the minor distinctions between emotions that would be made by System 2 processing would be of little consequence. It does not matter whether a person is angry, jealous, or resentful in determining forgiveness as long as it is known that the emotion has a negative valence rather than a positive one, or represents a threat rather than a reward. In models such as Ochsner and Barrett’s (2001) interactional model
of emotion, this threat versus reward detection takes place automatically before the participation of controlled processing. It would therefore seem appropriate to see System 1 processes as playing the primary role in creating that which will at least eventually become emotion.

When I speak of emotion originating in System 2 processing, I mean this in the sense that the output of System 2 (e.g., the knowledge that a dangerous criminal is nearby) may act as a stimulus that evokes emotion in System 1 processing. However, the initial processes involved in the creation of emotion are most likely to be System 1 processes. It is therefore likely that in cases where an individual experiences contradicting thoughts and feelings, that much of the processes underlying the emotions are System 1 processes, whereas many of the processes underlying thoughts are System 2 processes. It is in this way that we may return to consider those participants in studies of forgiveness, who believe they have forgiven, and yet continue to feel negative emotions toward the transgressor (or who believe they have not forgiven but continue to feel positive emotions toward the transgressor).

System 2 processes are believed to be conscious, thus, if a thought created by System 2 processing triggered an emotion, the individual who had that thought would be aware of it. Any second thought that was created by System 2 processing and that contradicted this emotion, would then also contradict the first. Thus, incongruence between thoughts and feelings that are derived from System 2 processing, would likely also be expressed as incongruence between multiple thoughts. It is therefore probable that when an individual experiences forgiveness cognitively but not affectively, like the individuals who claimed to have forgiven but experienced continued anger and
resentment, there is a conflict between System 1 and System 2 processing. That is to say that forgiveness occurred as the result of cognitive System 2 processes, but was not accompanied by a change in emotionally relevant System 1 processing.

**Thinking About Dual-Processes in Forgiveness**

How might processing within each system contribute to forgiveness? Let us imagine the unlikely example of individuals using System 2 processing alone. Such individuals might take into consideration whether forgiveness would be just, and whether it would lead to positive outcomes. They would then proceed to review each of these lines of thought systematically, taking into consideration every possible outcome. They may then assign each outcome a value representing its relative importance and likelihood. Finally they could make the cognitive decision to forgive or not forgive based on the value and probability of the corresponding outcomes. This ability to construct hypothetical outcomes, to deduce their causal paths, and consider each possibility in turn may constitute System 2’s contribution to the processes surrounding forgiveness.

In actuality, System 2 reasoning would likely be mediated by System 1 processes in the form of heuristics, and the priming of particular responses. For example, a recent quarrel may make past instances of betrayal more salient leading an individual to think that the transgressor is likely to transgress again. Similarly, the halo effect may influence one’s evaluation of another’s worth and therefore how much they deserve forgiveness (e.g. she is beautiful, therefore she is good, therefore she deserves forgiveness). Many individuals, however, are unlikely to see forgiveness as a matter of choice. They may rely purely on introspection, not looking for reason, but to see if they feel as though they have forgiven. The majority of individuals may at least take emotion into account. They may
react to a sense of foreboding, a gut impulse, or a longing for reconciliation. Here System 1 processing is likely to play a large role as discussed earlier.

We may further consider System 1 processing's contribution to forgiveness in terms of the associative network from which System 1 draws (Sloman, 1996). Forgiveness may be affected by associations with three different subjects. First, an individual may have various associations with the transgressor. This would be likely in the case that the transgressor was someone with whom the individual had a pre-existing relationship, but an association may also be formed between a transgressor who was previously unknown due to the emotions the individual experienced during and after the transgression. An individual may also have strong associations with the nature of the transgression. For example, individuals who have a history of being betrayed severely or repeatedly may associate this history with more or less minor transgressions that resemble betrayal, and become particularly sensitive to this class of transgressions.

This raises an interesting question; does one forgive a transgressor or a transgression? It seems that the majority of current literature focuses on forgiveness as a process that concerns people, rather than events (DeCourville et al., 2008; Enright et al. 1992; Trainer 1981). For example, Trainer (1981) focuses in her definition of forgiveness on how an individual behaves toward and feels about the transgressor. However, it is also possible that an individual may forgive a person for some offenses, but not others. This question cannot be answered by the current study but may be pursued in future forgiveness research.

Finally, an individual may have associations with the idea of forgiveness itself. For example, an individual who was raised to believe that forgiveness was an integral
part of their religion, may associate forgiveness with their positive, or negative, feelings surrounding their faith.

Before discussing the design of the study, the extent to which the major elements of dual-process theory are already present in prominent theories of forgiveness will be reviewed.

Models of Forgiveness

Despite the universality of dual-process theory across many areas of psychology, dual-process theory has not yet been explicitly applied to forgiveness research. In this section I will describe where elements that are related to dual-process theory are present in the literature, and where they are notably absent. It makes sense that if the term “dual-process theory” has never existed before in the forgiveness literature that researchers would use other terms to describe its key elements where relevant. One element clearly relevant to dual-process theory is multiple, parallel processes.

Further, I will continue to take note as to whether or not these processes are viewed as potentially conflicting or as always unified. If multiple processes were to always result in the same conclusion it would be difficult to distinguish them from a single process model. However, when there is conflict between processes we can infer that these multiple processes exist based on their conflicting outcomes in the form of thoughts, feelings, or behaviours. Thus, in the following pages I will document the extent to which each model accounts for the possibility of conflict amongst the processes that lead to or comprise forgiveness. One form of conflict created by competing multiple processes that is well documented in dual-process literature is what Epstein (1994) refers to as a “conflict between the head and heart”. Thus the level of congruence between
cognition and affect implied by each model is of particular interest. Further, core to dual-process theories are the conceptions of consciousness and control or automaticity. Where we find references to consciousness or automaticity in the forgiveness literature we have found a place that may benefit from dual-process theories.

Since a surge of research in the 1990s, many models of forgiveness have been formulated. It is beyond the scope of this review to describe every model of forgiveness that has been published. Instead, this review will focus on four of the most prominent models of forgiveness: Enright and his colleagues' decision driven process model (Enright, 1996; Enright, Freedman, & Rique, 1998; Enright & The Human Development Study Group, 1991), Worthington and colleagues' emotion driven model (Worthington, 1998; 2005) as well as their distinction between decisional and emotional forgiveness (Worthington et al. 2007), and McCullough and his colleagues' motivational model of forgiveness (McCullough et al., 1998; McCullough & Hoyt, 2002; McCullough, Root, & Cohen, 2006; McCullough, Worthington, & Rachal, 1997). In addition, I will briefly describe Scobie and Scobie's (2002) multidimensional model of forgiveness because it provides a perspective of forgiveness that, though not recognized by its authors, in one manner resembles a dual-process perspective. Other, less influential models, describe alternative ways to understand forgiveness, but do not differ substantially from the more widely accepted models in their treatment of those aspects of forgiveness that may relate to dual-process theory.

**Enright and colleagues' decision driven process model of forgiveness.** Based on North's (1987) philosophical work on defining forgiveness, Enright and his colleagues conceive of forgiveness as "the overcoming of negative affect and judgement toward the
offender, not by denying ourselves the right to such affect and judgement, but by
endeavouring to view the offender with compassion, benevolence, and love while
recognizing that he or she has abandoned the right to them.” (Enright et al., 1991, p. 126).

In an early version of their decision driven process model, Enright and the Human
Development Study Group outlined seven steps that they believed an offended individual
would go through when they forgive. These steps included becoming aware of the
negative psychological consequences of the offense, experiencing a need to resolve the
conflict, choosing between a justice and a mercy strategy, being motivated to forgive,
making a cognitive decision to forgive, using internal forgiveness strategies, and finally
becoming aware that “a behavioural response towards the other is necessary”. By 1996
Enright had extended this model to include 20 processes divided into 4 phases of
forgiveness: the uncovering phase, the decision phase, the work phase, and the deepening
phase. During the uncovering phase the offended person becomes aware of the
consequences of the offense, including their emotional pain. In the decision phase, the
individual considers and commits to responding to this offense with forgiveness. The
work phase involves attempting to understand the offender and what caused their actions,
and coming to feel empathy and compassion for them. The work phase also includes
what Enright calls “absorption of pain” (Enright 1996) in which the offended person
takes in the pain rather than casting it back at the offender. Finally, during the outcome
phase, the offended person recognizes their changed feelings and perspective.

In describing this model Enright and his colleagues never explicitly use the terms
implicit, automatic, unconscious, or subconscious; however, they frequently reference
psychological defenses that are fundamentally related to the psychoanalytic conception of
the unconscious (Enright, 1996; Enright et al., 1991, 1998). For example, during the uncovering phase the offended person is said to examine their defenses such as denial, repression, projection, and reaction formation. Similarly, Enright et al. (1991) describe multiple forms of what they call “pseudo-forgiveness”. In one form, that they label reaction formation, a person believes they have forgiven, but they have not because they continue to experience negative feelings such as resentment, mistrust, or blame.

Although the authors make use of the psychodynamic conception of the unconscious, dual-process theory tends to be more closely associated with what is sometimes referred to as the cognitive unconscious as noted by Epstein (1994). Epstein, believing that both ways of understanding the unconscious have some advantage, integrated the two in his cognitive-experiential self-theory, a now well-known dual-process theory. Other dual-process theorists have emphasized the distinction between the psychoanalytic and cognitive unconscious even more strongly. After reviewing Freud’s conception of the unconscious and comparing it to System 1, Evans and Frankish concluded that the two bear so little resemblance that “Freud’s taxonomies have little more relevance to contemporary dual-process theories than does Plato’s tripartite division of the soul.” (pg. 7.) If forgiveness researchers are primarily familiar with psychodynamic formulations of an unconscious they may benefit from recent cognitive models of the unconscious and the large empirical body on the unconscious that has been created through the study of dual-process theory.

In the view of Enright and his colleagues, forgiveness involves affect, behaviour, and cognition. Yet, they strongly emphasize that forgiveness is a conscious decision. This implies that affect, cognition, and behaviour are primarily under the control of the
offended and, therefore, may be chosen. This would contradict the notion that many components of cognition, affect, and behaviour are System 1 processes and are, therefore, automatic. The apparent contradiction between this claim that forgiveness is a conscious choice and their implication that forgiveness involves a change in, or the absence of, feelings that may exist at the unconscious level may be resolved by the sequential nature of their model. The conscious decision to forgive happens during a separate phase from the “work” of forgiveness. Thus, it may be conceived that deciding to forgive is not synonymous with forgiving, or complete forgiving. Instead, in their view, true forgiveness may be preceded by an incomplete forgiveness, or “pseudoforgiveness”.

They write:

[In one pattern of forgiveness] most people will consider forgiving another person when their emotional pain is so high that they must do something to change this uncomfortable situation. When they then decide to forgive, it is primarily a self-interested activity, the person forgives in order to feel better. Only after a period of time does the forgiver understand the giftlike quality of forgiveness. Only after a period of time does the forgiver focus more on the other person than on the self. (Enright et al., 1998, p.54-55).

Thus, it is possible that after the decision to forgive is made at a conscious level, in System 2, the affective change may occur through unconscious processes in System 1.

However, Enright and his colleagues do not provide a clear model of how such unconscious change may occur, often focusing instead on conscious cognitive processes such as reframing and attempting to understand the offender. These cognitive processes are said to foster empathy and compassion; however, it is unclear how these emotions are related to the negative feelings that may have previously existed at the unconscious level. Dual-process theory may help to account for this change by making explicit the difference between controlled and automatic processes and by providing models of how they interact.
Although Enright and his colleagues make it clear that they do not conceive of the process of forgiveness as completely linear, they do imply that only one of the components outlined in their theory happens at a time. Therefore, although their model contains multiple “processes,” it does not contain multiple, parallel processes. For example, Enright et al. (1991) state:

These processes are not considered rigidly inevitable or mechanical in that everyone who forgives necessarily passes through all. The sequence is logical, but not considered psychologically invariant. There will be both feedback and feedforward loops so that each component influences others (p. 140).

The term feedback loop refers to returning to a previous step or process before returning to the later step. Assuming Enright shares this understanding of the term, then he imagines that if one encounters difficulty with phenomena related to an earlier step one may return in their entirety to this previous step, rather than struggling with this earlier step while simultaneously continuing to work through other steps.

From a dual-process perspective, we would expect processes within System 1 to take place in parallel to each other and simultaneously with processes in System 2, whereas processes within System 2 would take place serially (i.e., one at a time). Thus Enright treats these processes as though they take place the same way as do processes in System 2, yet he insists that forgiveness contains an affective component, and affect is closely tied to System 1 in the dual-process literature. Thus, Enright et al.’s account of multiple processes within forgiveness differ significantly, and at times contradict, what would be expected from a dual-process perspective.

Worthington and colleagues’ emotion driven model of forgiveness. Another well-known model of forgiveness is provided by Worthington (1998). This emotion driven model of forgiveness consists of three components: humility, empathy, and
commitment. Humility occurs when an individual realizes that the feelings of the offender are feelings that they have had in the past when they have been equally wrong. They then realize that if they want mercy it is only fair that they reciprocate.

Commitment takes the form of an overt behaviour such as crying, or telling a counsellor you have forgiven. Through various processes, such as cognitive dissonance and self-perception, this behaviour allows the individual to keep to their commitment to forgive.

As compared to the cognitive emphasis of Enright, Worthington believes affect to be the most critical component of forgiveness. He writes:

In the model of forgiveness I am suggesting, cognition and behaviour are thought to be concomitant with a primary emotional wound [...] Cognitive and behavioural techniques of marital counselling or family therapy will not easily heal the wound, though with persistence they may break through the cognitive and behavioural overlays and speak to the emotional wound. In contrast I suggest that forgiveness is initiated by empathy for the offender, furthered by humility in the person who was hurt, and solidified through making a public commitment to forgiveness. (Worthington, 1998, p.62-63).

So we see that Worthington et al.'s emotion driven model holds that emotion, cognition, and behaviour will work together as a unified whole. However, in this view, effective forgiveness therapy acts through addressing emotion. Their emotion driven model’s emphasis on emotion suggests that System 1 processing is at the core of forgiveness. In this case we may better understand the limited ability of cognitive and behavioural techniques by understanding the relationship between System 1 and System 2 processes. There appears to be little room in this model for inner conflict, and all other signs of dual-processing are notably absent.

**Worthington and colleagues’ decisional versus emotional forgiveness distinction.** Without drawing a clear connection to his emotion driven model of forgiveness, Worthington (2005) has written of two different forms of forgiveness that
resemble System 1 and System 2 processes. What he titled "decisional forgiveness" (p. 560) resembles System 2 processing. In decisional forgiveness one makes the decision to cease all negative behaviours towards a transgressor and (if in a continuing close relationship) restore positive behaviours towards the transgressor. Here, what Worthington calls the "experience of forgiveness" (p. 561) may only come later, if at all. Instead the focus is on making a choice to control one's behaviour. Such a choice, I would argue, can only be made within System 2. Worthington contrasts decisional forgiveness with what he calls "emotional forgiveness" (p. 560). By making this distinction he suggests that emotional forgiveness is not a choice and is therefore likely rooted in the System 1 processing. This is consistent with current dual-process perspectives on emotion discussed earlier.

In a later paper (Worthington et al., 2007), he and his colleagues elaborate on each form of forgiveness and their likely consequences. Here it is stated that emotional forgiveness involves changes in cognition, emotion and motivation. Each of these processes could take place in System 1. Further, in this paper the authors draw on previous research that seemed to distinguish between decisional and emotional forgiveness (though framed differently by the original authors), including the research by Huang and Enright (2000). This distinction is again reflected in the work of Trainer (1981), who differentiated between role-expected and expedited forgiveness, both of which are externally motivated by social and practical concerns, and intrinsic forgiveness, which involves an affective change (see Further Applications of Dual-Process Theory to Forgiveness Therapy and Research for further discussion of this distinction in these authors works). It seems that several researchers have attempted to
depict the System 1 versus System 2 divide, without knowledge of the strong theoretical basis for such a divide that already exists.

**McCullough and colleagues' motivational model of forgiveness.** Collaborating with Worthington and Rachal, McCullough presents a similar model to Worthington and colleagues' emotion driven model of forgiveness (McCullough, Worthington, & Rachal, 1997). Forgiveness is here defined as a motivational transformation in which one attempts to inhibit relationship-destructive responses and behave constructively toward the offender. Proponents of the model hypothesize two forms of relationship destructive motivations: avoidance and revenge. In the past, motivation has been conceived of as both a conscious and an unconscious process (see Westen, 1998), speaking clearly to the dual-process literature; however, McCullough and his colleagues do not address this point. This is of particular importance considering that a now popular measure of forgiveness, called the Transgression-Related Interpersonal Motivations Inventory (TRIM), was developed out of this model (McCullough, Worthington, & Rachal, 1997; McCullough et al., 1998).

The TRIM was originally formulated to contain two subscales that loaded on two factors: revenge and avoidance (McCullough et al. 1998). In 2002, McCullough and Hoyt added a third subscale to measure benevolence. Subsequently, factor analysis revealed a two factor solution, with avoidance loading positively on one factor, benevolence loading negatively on the same factor, and revenge loading positively on the second factor (McCullough et al., 2006). This gives the TRIM the capacity to measure multiple, simultaneous processes, in the form of multiple, resulting motivations. Further, it is
capable of capturing conflict within forgiveness as it allows an individual to score both high on revenge and high on benevolence.

It must be noted, however, that the separation between revenge and avoidance / benevolence bears no relation to the conscious/reflective vs. unconscious/automatic divide of dual-process theory. Both of these factors could be the result of parallel processes within System 1, in line with the emphasis that Worthington places on emotion. Alternatively, each factor could reflect different aspects of an individual’s circumstance, considered serially within System 2.

McCullough et al. (2006) come close to citing dual-process theory when they state that:

focusing on the benefits that one has gained (or might gain in the future) from a transgression could help to negate some of the transgression’s psychological costs and, by doing so, encourage forgiveness. This proposition is consistent with other studies showing that one’s attentional focus after negative life events (e.g., rumination vs. distraction, focus on ‘hot’ vs. ‘cool’ features of the event [...] has implications for emotion, well-being, and social behaviour (p. 888)

When McCullough et al. state that attentional focus after negative life events has been found to affect emotion, well-being, and social behaviour, they cite Ayduk, Mischel, and Downey’s (2002) article on “hot” and “cool” focus in reacting to rejection. This research is based on Metcalfe and Mischel’s (1999) framework for self-control, which is itself a dual-process theory in which “cool” corresponds to System 2 processing, and “hot” refers to System 1 processing. Given that neither this article nor Metcalfe and Mischel’s (1999) article ever refers to dual-process theory by name, there is no reason to believe that this means McCullough and his colleagues were aware of this manner of classifying reasoning or believed it was important to forgiveness itself.
Rather than examining the components or stages of forgiveness, McCullough and his colleagues focus on examining factors that affect the likeliness of forgiveness, with a strong emphasis on empathy as a mediator (McCullough et al., 1997; 1998). McCullough and his colleagues identify four broad categories of variables affecting forgiveness. The first category, called social-cognitive determinants, include such factors as affective empathy, rumination, and attribution of blame and intent. The second category represents offense related variables such as severity of the offense, and whether or not the offender apologized. Next the researchers take into account relational determinates such as relationship satisfaction, closeness, and commitment. The most distal set of factors outlined by McCullough and his colleagues are personality level determinants such as reasoning about forgiveness (based on Enright et al.’s 1989 developmental model), agreeableness, attitude towards revenge, and style of responding to anger. None of these variables have a clear relationship with unconscious processes or automaticity, and in testing their relationship to scores on the TRIM no attempt is made to measure unconscious aspects of any variable (McCullough et al. 1998). In addition, although the predictors of Revenge and Avoidance/Benevolence are examined separately in McCullough and colleagues’ studies, there is no attempt to conceptually or statistically consider the predictors of conflicted responses (i.e., individuals scoring high on both Revenge and Benevolence).

**Scobie and Scobie’s multidimensional model of forgiveness.** Scobie and Scobie (2002) offer what they term a “multidimensional” model of forgiveness. In order to create this model they made a list of components that they had seen frequently mentioned in the forgiveness literature and selected three phrases for each component that could be easily
associated with that component. These components included relationships, new beginning, guilt reduction, and condoning. An example of a phrase for new beginning would be “a new start.” In two studies, they had participants rate the extent to which each of these phrases represented their understanding of forgiveness, both from the perspective of the forgiver and from the perspective of the forgiven. In a third study they added three more components (healing, religious, and legal), and then repeated the same basic process. The authors then examined the correlations between each component, but could not perform a factor analysis due to their limited sample size (for study 1, $n = 39$; for study 2, $n = 63$; and for study 3, $n = 73$). The relationships, healing, new beginning, and guilt release were determined to be core to forgiveness, and the religious, legal, and condoning components were designated non-core.

I have taken note of this model because it is described as “multi-dimensional” suggesting that forgiveness may be conceived of as containing multiple parallel processes. Unlike the components described in Enright et al.’s model, Scobie and Scobie (2002) do not suggest any particular sequence through which each component takes place. Some of these components are clearly not processes, such as “relationships” and “religious”; however, it is possible that, for example, guilt release is seen as taking place before, after, or at the same time as healing or a new beginning. Thus, this model leaves open the possibility of forgiveness consisting of multiple parallel processes. However, Scobie and Scobie did not consider aspects of forgiveness processes such as consciousness and automaticity, and, because they provided the list of components themselves and the study was self-report, these aspects could not otherwise be discovered.
Concluding thoughts on current models of forgiveness. None of the models of forgiveness, including less influential models not described in this section, explicitly mention automaticity, consciousness, or parallel processing. Yet, authors describe relevant phenomena or processes that would be clarified if these concepts were made explicit. For example, Enright and his colleagues make reference to defense mechanisms in their description of what they call “pseudo-forgiveness.” However, they do not explicitly acknowledge that this means that unconscious processes occurring parallel with consciousness must play a role in the likelihood of an individual forgiving. Given that this is not made explicit, there can be no attempt to apply a modern understanding of the unconscious to forgiveness.

This is of particular concern because the concept of defense mechanisms was created based on a psychodynamic understanding of the unconscious which lacks many of the advantages of a modern understanding of the unconscious. Further, by referring to a psychodynamic understanding of the unconscious researchers neglect the body of research that has been conducted based on a modern understanding of the unconscious. In addition, each of the models described speak of multiple processes, but provide no model by which to understand how they interact. Further, the models specifically fail to acknowledge the possibility of engaging in multiple processes at the same time, either implying that only one process is undergone at any given time, or by not addressing this matter at all.

It is clear that there are many ways in which dual-process theory may inform research in forgiveness. By describing the relationship between conscious and unconscious processes it may allow us to better understand how we can address
components of forgiveness which exist in one System versus the other, and how different components of forgiveness are likely to affect each other. To adequately measure these different components or types of forgiveness, it is important for authors to make explicit whether or not certain processes are conscious or unconscious.

**The Current Study**

The purpose of the proposed study is to investigate the relevance of dual-process theory to forgiveness research by establishing whether or not processing in each system plays a role in forgiveness. This represents a first step in a program of research that may help to create an understanding of differences in the definition of forgiveness, and to design effective practices involving forgiveness in clinical practice.

How might one establish that both systems play a role in forgiveness? An individual with a strong interest in external validity might be tempted to immediately look for evidence of each of the systems in the experiences of individuals who have recently experienced a transgression in real life. However, if participants were asked to relate their thoughts and feelings about their actual experiences with forgiveness or non-forgiveness it would be difficult or impossible to determine how System 1 and System 2 processes played a role in these experiences. For example, during the delay in between the time they had this experience and their participation in the study, conclusions drawn from System 2 processing could have become ingrained in System 1 processing through automatization, and associations or behaviours created by System 1 processing may have been rationalized (resulting in confabulation) and/or reflected upon through System 2 processing. Thus, it would be impossible to establish the origin of any thought, feeling, or behaviour. The argument that both implicit reactions (driven by System 1 processing),
and analytic reasoning (through System 2 processing), were involved in a participant’s account of how they came to forgive or not forgive could therefore be rebutted by the argument that both the reactions and reasoning may have actually originated from processing within a single system.

The alternative to working with individuals’ actual experiences with forgiveness is to present them with a hypothetical scenario in which a transgression occurs at their expense. The challenge presented by this approach is that the majority of heuristics and associations used by System 1 processing that would normally exist in such a situation (what we might consider “System 1 content”), such as the individual’s associations with the transgressor, would be absent, and any associations that did exist would be indistinguishable from a belief created through System 2 processing.

The solution to this problem is to experimentally create associations for System 1 processing to draw upon. Associations that are highly relevant to forgiveness might include a participant’s associations with the offender. A potential confound would be introduced if an association was formed in such a way that it also caused participants to form corresponding beliefs that could direct System 2 processing. For example, if participants were to form a negative association with an offender by being assigned a poor grade on a joint task with the offender they might also believe that the offender was less competent, less valuable as a friend, and therefore not worth the effort required to forgive. Thus, a form of conditioning was used to create positive or negative associations with the offender. To remove any doubt that corresponding System 2 relevant content was not created simultaneously, this conditioning used subliminal stimuli.
Several studies have successfully conditioned attitudes or behaviours using subliminal stimuli (Bunce, et al., 1999; De Houwer, Baeyens, & Eelen, 1994; De Houwer, Hendrickx, & Baeyens, 1997; Dijksterhuis, 2004; Krosnick, Betz, Jussim, & Lynn, 1992). The conditioning phase of the study will closely resemble the study conducted by Krosnick et al. (1992). In the past this study has received criticism because participants were presented with only positive or negative unconditioned stimuli (US), rather than both, leaving open the possibility the researchers may have only primed mood, which in turn affects evaluation, rather than conditioned the participants (Lovibond & Shanks, 2002). For the current study this distinction is not of great consequence as both priming and conditioning may be considered System 1 processes.

For half of the participants, photographs of a hypothetical transgressor will be paired with subliminal presentations of stimuli found to elicit positive affect. For the other half of the participants, the same photographs of the hypothetical transgressor will be paired with subliminal presentations of stimuli found to elicit negative affect. It should be kept in mind that even if the stimuli were not subliminal, there is no reason to believe that the conditioning process would result in System 2 generated beliefs. That is because there is no rational or otherwise rule-based reasoning that would result in the conclusion that someone is bad or less deserving of forgiveness because photographs of them were displayed shortly after viewing photographs of unpleasant stimuli.

System 2 processing, but not System 1 processing, depends on working memory, thus researchers may use what is referred to as “working memory load” (WML) to isolate System 1 processes (Bargh & Tota, 1988; Barrett, Tugade, & Engle, 2004; De Neys, 2006; Logan, 1979; Sloman, 1996). In studies using WML, participants are asked to
memorize a piece of information in order to keep the working memory occupied, such as the pattern of dots in a 3X3 grid, or a series of digits. Because System 2 processing requires working memory, System 2 processing will be attenuated to the extent that working memory is no longer available. Tasks that are successfully completed during WML can be assumed to have been performed largely through System 1 processing.

In the current study, I will use WML to create a reliance on System 1 processing amongst half of the participants. Thus, half of the participants, in the WML condition, will be asked to consider forgiveness when they can only use System 1, and half of the participants, in the no-WML condition, would be able to consider forgiveness with both systems. The differences in the performance between participants with WML and participants without WML can then be attributed to System 2. Currently, there is no reason to believe that having the ability to fully use System 2 processing will lead individuals to be more or less forgiving. However, if System 2 has access to WML it would be able to regulate System 1 responses as suggested by researchers positing what Gilbert (1999) termed a “corrective design”. Thus, participants in the no-WML condition may use System 2 processing to reason that forgiveness should not be determined by an impulse of unknown origin (the association created, unbeknownst to them through subliminal conditioning). Reasons to forgive or not to forgive are equally likely to be created by System 2 at this time, leaving less variance in forgiveness to be determined by System 1 processes. Thus, although we cannot test whether or not System 2 processes have direct effects on forgiveness in the current study, we can test the role of System 2 processing as a moderator of System 1 processing’s effects on forgiveness.
In the current study I used a Go/No-Go Association Task (GNAT; Nozek & Banaji, 2001) to implicitly measure attitudes towards the transgressor. This measure may act as an additional manipulation check for the conditioning phase of the study and help illuminate how System 1 processes relate to explicit measures of forgiveness. If conditioning operates, and affects forgiveness, by creating implicit associations, this should be observed as a difference in implicit attitude between affective conditions. The GNAT, like its predecessor the Implicit Association Test (IAT), is capable of assessing cognitive associations held by a participant without the need for the participant to be aware of either the associations or the purpose of the task. Thus, the task can assess attitudes activated through System 1, without interference from System 2. Unlike the IAT, the GNAT is capable of examining automatic attitudes towards a single target category free of context, rather than an attitude toward one target relative to a second target. For example, the GNAT can determine if someone has a positive attitude toward fruit, rather than that they simply have a better attitude towards fruit than they do towards insects, and thus has been recommended as an alternative to the IAT for use when a target has no obvious comparison group (Nosek et al., 2007).

The principle behind the GNAT is that if presented with three or four stimuli that one must respond to, it should be easier to remember to give the same response to two related stimuli, than to remember to give the same response to two unrelated stimuli. Here the category (e.g., fruit) that a researcher wishes to assess a participant’s attitudes towards is referred to as the target category, and the traits (e.g., good and bad) that the researcher believes may represent the participant’s attitude towards that target are called the attribute categories. Each GNAT generally requires two attribute categories that are
opposites of each other. During the GNAT, participants are rapidly presented with images or words from each category. In response to each stimulus the participant must give either a “Go” (e.g., pressing the spacebar) or a “No-Go” response (e.g., not pressing the spacebar). Participants are instructed to give their response to each stimulus as quickly as possible, and both reaction time and accuracy may be measured. Trials are divided into blocks allowing researchers to give different instructions for responses in each block, sometimes pairing the target category with one attribute together for a single response and other times pairing the target category with the opposite attribute.

Shorter response times and better accuracy when the participant must give the same response to both the target and an attribute indicate a stronger association between the target and that attribute (usually the researcher will choose to examine just one: response time or accuracy). In the current study the target category was the transgressor, and the attribute categories were “Good” and “Bad.” If participants took longer and made more errors when they were required to give the same response to both the transgressor and “Good” images as opposed to both the transgressor and “Bad” images this finding would indicate that the participants held negative associations with the transgressor.

**Summary of design and hypotheses.** In sum, the current study investigates the roles of System 1 and System 2 in forgiveness using a 2 (positive vs. negative affect) X 2 (WML vs. no-WML) between-subjects design. I designed the study based on three predictions derived from dual-process theory. These predictions can be understood at a conceptual and at an operational level. I will first outline these predictions conceptually, and then I will state my hypotheses at the operational level.
The implicit, unconscious processes of System 1 can have a direct impact on forgiveness (Hypothesis 1 below). Further, System 2 processing monitors System 1 responses, and inhibits them when necessary. When resources used by System 2 processing are low, individuals will rely on automatic processing, allowing System 1 processing to contribute to the majority of variance in behavioural responses. However, when these same resources are plentiful, System 2 processing will reduce the impact of System 1 processing on behaviour when that impact is deemed inappropriate (Hypothesis 2 below). Finally, the effects of System 1 processing can be determined by implicitly held associations, here created by conditioning (Hypothesis 3 below). Stated operationally my hypotheses are as follows:

Hypothesis 1: There should be a main effect for affective condition (conditioning with positive valence vs. negative valence stimuli) such that those in the positive condition forgive more than those in the negative condition.

Hypothesis 2: There will be an interaction in which WML condition will moderate the relationship between affective condition and forgiveness. Participants with WML in the positive affective condition will forgive more than those with WML in the negative condition. A smaller or non-significant difference in the same direction will be found between participants in the positive affective versus negative affective condition amongst those with no WML. Similarly, those in the positive affective condition with WML will forgive more than those in the positive affective condition with no WML, and those in the negative affective condition with WML will forgive less than those in the negative affective condition with no WML.
Hypothesis 3: Implicit attitude, as measured by the GNAT, will fully mediate the relationship between affective condition and forgiveness. If the relationship between affective condition and forgiveness is non-significant amongst participants without WML, this hypothesis will be tested amongst participants in the WML condition alone.

This mediation will be observed as follows. First, implicit attitude will correlate with affective condition such that those in the positive affective condition will have a more positive implicit attitude as compared to those in the negative affective condition. This will be indicated by shorter latencies in the positive affective condition when photographs of the offender and “good” stimuli require the same response, as compared to when photographs of the offender and “bad” stimuli require the same response (yielding higher residual RT or difference scores in the prior condition; see Method for details pertaining to this measure). Next, affective condition will correlate with forgiveness such that those in the positive affective condition will be more forgiving than those in the negative affective conditioning. Implicit attitude will also correlate positively with forgiveness after controlling for affective condition. After controlling for implicit attitude, however, the relationship between affective condition and forgiveness will no longer be significant. A Sobel test will then be used to test the significance of the indirect effect of affective condition on forgiveness via implicit attitude.

In addition to evaluating these three hypotheses, exploratory analyses will also be used to examine the relationships between self-report (explicit) measures of the cognitive, affective, and behavioural components of attitudes towards the offender when considering forgiveness, and System 1 versus System 2 processing. It has been suggested that affect is more strongly related to System 1 processing, whereas System 2 processing
relies solely on cognition. As such we might expect that self-reported affective attitude
towards the offender may correlate more strongly with implicit attitude than self-reported
cognitive attitude would correlate with implicit attitude (which could potentially have a
large System 2 component).
Pilot Study 1

The purpose of the first pilot study was to select stimuli that could be used for the affective conditioning phase of the study.

Method

Participants. I recruited 24 participants through a psychology research participation website, through posters placed throughout a midsized university in Ontario, Canada, and by word of mouth (18 women, 6 men; \( M \) age = 22.29, \( SD \) = 5.76, range = 17-47). Participants received course credit or $5 for their time.

Procedure and materials. I presented all questions by computer. Copies of all measures can be found in Appendix A. Responses could be entered by keyboard or mouse. I tested participants individually or in groups of 2 to 4. After they had read and signed the consent form I directed each participant to the next available computer. When participants arrived at the computers the following instructions were displayed on the screen:

Welcome to the study.

Please remember you may withdraw from the study at any time without penalty. To skip an item hold down "Ctrl" and press the right arrow key.

Please press the spacebar to continue.

When the spacebar was pressed the following text was displayed on the screen:

We are now going to show you some pictures of a woman going about her daily activities. Please watch these pictures in a relaxed but attentive manner. Each picture will be exposed for a very short interval. It is important that you keep your eyes on the center of the screen in between slides so that you can see as many details as possible when the next slide appears. The purpose of this slideshow is to get you to form a broad impression of the woman as though you have known her for some time.

Please press the space bar to continue.
I adapted this description from Krosnick et al. (1992, p.155). The computers presented each participant with one set of 30 photographs of one woman performing various activities that are common in everyday life, and then a second nearly identical set of 30 photographs of a second woman performing the same activities. In the conditioning phase of the main study, I used one of these sets of photographs to represent the offender in the hypothetical scenario also presented in the main study. I had participants rate the second set of photographs so that I could use it in place of the first set if the first set elicited extreme ratings from participants, or I could use it as a comparison group in the GNAT if required. The computers presented each photo for 2 seconds, followed by a 1 second interval. Following the presentation of each set of photographs, the computers presented participants with the following questions in a random order:

   Based on these photos, how LIKEABLE is the woman depicted?

   Based on these photos, how FAMILIAR is the woman depicted?

   Based on these photos, how ATTRACTIVE is the woman depicted?

Each question was accompanied by a 7 point rating scale, with the anchor “Not [target trait] at all” at 1, and the anchor “Very [target trait]” at 7. After each set of ratings, the computer presented each participant with a photograph of the face of the woman depicted in the set of photograph they had just rated. This reference photo would be presented with, and referred to, in all questionnaires regarding the hypothetical offender during the main study. The computers instructed participants to rate this photo on the same three scales.

   Next participants rated 50 photographs that could potentially be used as pleasant and unpleasant affective stimuli for the main study: 25 I believed to be pleasant, and 25 I
believed to be unpleasant. The computers displayed these pleasant and unpleasant photographs in a single set in a random order. The computers instructed participants to rate each photograph based on their initial reaction as to how pleasant or unpleasant it was on a scale of 1, “Extremely Unpleasant”, to 12, “Extremely Pleasant”. Each photograph and rating scale remained on the screen until the participant rated the photograph or indicated that they wished to skip to the next item. I took the photographs that I used for the potential affective stimuli from a popular photo sharing website (www.flickr.com). I chose each photo based on two criteria: it contained either strongly pleasant or strongly unpleasant content, and it had a Creative Commons copyright license.

Finally, the computers instructed participants to indicate their ages and sexes before being debriefed.

Results

For all studies (including the main study), I used mean scores on each scale in the analyses (rather than total scores) so that participants missing less than 10% of items on a scale could be retained without these missing items affecting their scores. The means and standard deviations for the ratings of the photographs of the women are displayed in Table 1. I selected the set of photographs of Woman 1 to be used to represent the offender in the main study. Mean pleasantness ratings for the 50 affective stimuli ranged from to 10.79 to 1.42. I initially selected stimuli based on two criteria. I chose those with the highest and lowest pleasantness ratings (rounded to the nearest integer) as the 10 positive and 10 negative affect stimuli respectively. In the case that multiple stimuli had the same mean rating, I selected the stimulus with the smallest standard deviation.
Table 1

*Means and Standard Deviations for Trait Ratings of Offender Stimuli*

<table>
<thead>
<tr>
<th>Trait</th>
<th>Woman 1</th>
<th></th>
<th>Woman 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Set of Photos</td>
<td>Reference Photo</td>
<td>Set of Photos</td>
<td>Reference Photo</td>
</tr>
<tr>
<td>Likeable</td>
<td>5.42 (0.93)</td>
<td>4.96 (0.91)</td>
<td>5.12 (1.08)</td>
<td>4.38 (1.06)</td>
</tr>
<tr>
<td>Familiar</td>
<td>4.58 (0.93)</td>
<td>4.62 (1.14)</td>
<td>4.96 (1.08)</td>
<td>4.12 (1.36)</td>
</tr>
<tr>
<td>Attractive</td>
<td>5.17 (0.96)</td>
<td>5.08 (0.78)</td>
<td>4.79 (1.02)</td>
<td>4.13 (0.95)</td>
</tr>
</tbody>
</table>

Note. N = 24.

During preparation for the subliminal conditioning phase of Pilot Study 2, one of the selected positive affective stimuli, showing a baby’s face, appeared to be more easily identified when exposed for less than 50ms as compared to other stimuli. I therefore replaced this stimulus with one of the next highest rated stimuli. I chose the replacement stimulus over others with the same pleasantness rating because it was unambiguous and because it had no readily identifiable features when displayed for less than 50ms. The means and standard deviations of the pleasantness ratings for both initially and finally selected stimuli are provided in Table 2.
Table 2

*Means and Standard Deviations of Pleasantness Ratings for Affective Stimuli*

<table>
<thead>
<tr>
<th>Stimulus Valence</th>
<th>M</th>
<th>(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>10.79</td>
<td>(1.47)</td>
</tr>
<tr>
<td>Positive</td>
<td>10.54</td>
<td>(1.28)</td>
</tr>
<tr>
<td>Positive</td>
<td>10.50</td>
<td>(1.62)</td>
</tr>
<tr>
<td>Positive</td>
<td>10.38</td>
<td>(1.47)</td>
</tr>
<tr>
<td>Positive</td>
<td>10.17</td>
<td>(1.99)</td>
</tr>
<tr>
<td>Positive</td>
<td>9.96</td>
<td>(2.44)</td>
</tr>
<tr>
<td>Positive</td>
<td>9.87</td>
<td>(2.38)</td>
</tr>
<tr>
<td>Positive</td>
<td>9.79</td>
<td>(1.50)</td>
</tr>
<tr>
<td>Positive</td>
<td>9.67</td>
<td>(2.62)</td>
</tr>
<tr>
<td>Positive</td>
<td>9.50</td>
<td>(3.13)</td>
</tr>
<tr>
<td>Positive</td>
<td>9.17</td>
<td>(1.61)</td>
</tr>
<tr>
<td>Negative</td>
<td>2.46</td>
<td>(1.53)</td>
</tr>
<tr>
<td>Negative</td>
<td>2.42</td>
<td>(1.47)</td>
</tr>
<tr>
<td>Negative</td>
<td>2.38</td>
<td>(1.56)</td>
</tr>
<tr>
<td>Negative</td>
<td>2.21</td>
<td>(1.41)</td>
</tr>
<tr>
<td>Negative</td>
<td>1.96</td>
<td>(1.30)</td>
</tr>
<tr>
<td>Negative</td>
<td>1.83</td>
<td>(1.20)</td>
</tr>
<tr>
<td>Negative</td>
<td>1.75</td>
<td>(1.22)</td>
</tr>
<tr>
<td>Negative</td>
<td>1.62</td>
<td>(0.92)</td>
</tr>
<tr>
<td>Negative</td>
<td>1.58</td>
<td>(1.02)</td>
</tr>
<tr>
<td>Negative</td>
<td>1.42</td>
<td>(0.93)</td>
</tr>
</tbody>
</table>

*Note. N = 24*

*aExcluded from the final selection of affective stimuli because it was more easily identified as compared to other stimuli when exposed for under 50ms

*bReplaced stimulus referred to in note a in the final selection*
Pilot Study 2

The initial purpose of the second pilot study was to test if the conditioning phase of the study would be effective. A second purpose for the second study arose from the development of the GNAT. Although I had considered a more traditional format for the GNAT, using two sets of target stimuli, I decided that the most appropriate format for the GNAT was the context-free format described in Nosek and Banaji (2001). This would mean that instead of using two sets of photographs of women, yielding a measurement of relative attitude to each woman, I used a single set of photographs representing the offender in our hypothetical transgression. This introduced a methodological issue.

Initially, I had intended to use the same wordlists used in Nosek and Banaji (2001) to represent the attribute concepts of “good” and “bad.” However, I was concerned that if the only stimuli in the GNAT that were photographs were the stimuli representing the offender, participants would learn to discriminate between the stimuli based on whether each stimulus was a photograph or a word, not based on the content of the stimuli and what they represent. This would result in the GNAT measuring participants’ attitudes towards photographs, as compared to words, rather than their implicit attitudes towards the offender. Thus, I had a set of photographs rated by the participants in the second pilot study so that they could be used to represent the concepts of “good” and “bad” in the GNAT in the main study.

In addition, I used the second pilot study to ensure that the programming for a forced choice identification task was running smoothly. The forced choice identification task is a task designed to determine the extent to which individuals are aware of and can identify stimuli that are exposed for a brief interval. Tasks such as this one have been
used in past studies involving conditioning with subliminal stimuli (e.g., Bunce et al., 1999; Krosnick et al., 1992).

Please note, to simplify instructions and make the hypothetical scenario used in the main study more personal, I gave the name “Patricia” to the woman depicted in the conditioning phase of the pilot studies and main study, and who was the offender in the hypothetical transgression in the main study.

**Method**

**Participants.** I recruited 42 participants through a psychology research participation website, through posters that I placed throughout a midsized university in Ontario, Canada, and by word of mouth (37 women, 5 men; $M_{age} = 20.64$, $SD = 5.76$, range = 17-47). Participants received course credit or $10 for their time.

**Materials.** I adapted scales measuring affective, cognitive, and general attitude towards the offender from Crites, Fabrigar, and Petty’s (1994) multi-response checklist scales. These scales were designed by Crites, Fabrigar, and Petty to allow researchers to make direct comparisons between them and examine the relative effects of cognitive versus affective attitudes. For the general attitude scale the computers provided the instructions “Please indicate whether or not each word describes your general evaluation of PATRICIA by clicking on the corresponding number.” The computers displayed the same instructions for the affective and cognitive scales, with the exception that the words “your general evaluation of PATRICIA” were replaced with the words “your feelings towards PATRICIA” and “traits belonging to Patricia,” respectively. Example items from the general scale include “Bad” and “Positive,” examples of items from the affective scale include “Hateful” and “Relaxed,” and example items from the cognitive scale
include “Foolish” and “Valuable.” The computers instructed participants to indicate if each item definitely described, slightly described, did not describe, or did not apply to Patricia or their feelings or attitudes towards her. On the display, these options corresponded to the labels 2, 1, 0 or NA, however, I scored positively valenced items 2, 1, 0, and 0, respectively, and negatively valenced items -2, -1, 0, and 0, respectively. Therefore, higher scores on each of these scales indicate a more positive attitude towards Patricia. Cronbach’s alpha in the current sample was .78 for the general attitude scale, .83 for the affective attitude scale, and .80 for the cognitive attitude scale.

I used the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988) to measure mood. The BMIS requires a participant to rate how well each word in a list of 16 adjectives describes the mood that the participant is presently experiencing. The participant can select from the responses “Definitely Do Not Feel,” “Do Not Feel,” “Slightly Feel,” or “Definitely Feel.” These terms corresponded to the letters XX, X, V, and VV, respectively, on the display and I scored them 1 through 4 (negatively valenced items were reverse scored), respectively. Higher scores indicate a more positively valenced mood. Example items include “Content,” “Grouchy,” “Loving,” and “Fed up.” Cronbach’s alpha in the current sample was .80.

I used a single question to assess the extent to which participants attended to the affective stimuli during the conditioning phase of the study. This question read “If you found yourself in the distractor condition, were you able to disattend to the images when they appeared on the screen, or did you find they grabbed your attention?” and participants could respond “I was not in the distractor condition,” “Yes, I was able to ignore the distractor images,” or “No, I could not stop looking at the distractor images.”
reasoned that those participants who did not believe themselves to be in the distractor condition must not have consciously perceived the affective stimuli (described as distractor images in the instructions), and, therefore, were unable to attend to them.

I used four items to assess participants’ subjective awareness of the affective stimuli. Following the example of previous studies that used subliminal stimuli (De Houwer et al., 1997; Dijksterhuis, 2004), the computers presented all participants with the question “Did you see anything strange during the slideshow?” (The conditioning phase of the study had been called a slideshow in the instructions.) If participants responded “Yes,” the computer displayed the instructions “Please describe what you saw that was strange,” so that it could be determined if participants were referring to the affective stimuli or another aspect of the study. If participants responded “No,” the computers immediately presented the next question. The next question, posed to all participants, was “Did you see any images flash on the screen before the target and the images of Patricia?” If participants responded “Yes” the computers prompted them to describe the images that they saw, and if participants responded “No” the computers immediately presented the next task in the study. Using both questions provided me with the ability to determine the amount of prompting required for participants to recall the appearance of affective stimuli.

**Procedure.** I presented all questions by computer. Responses could be entered by keyboard or mouse. I tested participants individually or in groups of two to seven. After they had read and signed the consent forms, I directed each participant to a computer. The computers displayed the following instructions in the first three slides:

This study will be examining the relationship between impression formation and mood. Many past studies have used stories or scenarios; however, the problem
with this is that they may be perceived as artificial. In this study, to make this more realistic, you will be watching a slideshow that simulates past experience in a relationship with an individual. The slide show will consist of photographs of a person, named PATRICIA, going about her daily activities. Please watch these pictures in a relaxed but attentive manner.

Each slide will be exposed for a very short interval. It is important that you keep your eyes on the center of the screen between slides so that you can see as many details as possible when the next slide appears. A cross hair will appear on the screen between images to help you maintain focus. The cross hair will appear on a swirled background used to prepare your vision for the next slide (pictured below). You may ignore this swirled image.

Since we are also interested in the role of attention some participants will be in what we call "the distractor condition." For these participants the slideshow will serve a second purpose: to test the effects of distractions. In this condition, various images will be randomly flashed for very short intervals during the slideshow. If you find yourself in this condition it is your task to ignore these images as best you can. Remember, the main purpose of this slide show is to get you to form a broad impression of Patricia as if you had known her for some time.

Please press the spacebar to continue.

When participants indicated their readiness, the computers displayed the 30 images selected to represent Patricia for 2 seconds each, with a 1 second interstimulus interval. An affective stimulus preceded each for 30ms (±4), depending on the refresh rate of the individual computer screen, followed by a 500ms exposure of the mask. I chose this display time for the affective stimuli because it was the minimum display time allowed by hardware and software limitations. It is within a 13-55ms rule of thumb used for display times for subliminal primes; however, the appropriate display time can vary by stimulus, mask, and participant (Epley, n.d.). For half of the participants, assigned to the positive affective condition, the computers displayed the pleasant affective stimuli, and for half of the participants, assigned to the negative affective condition, the computers displayed the unpleasant affective stimuli.
Next, participants completed the affective, cognitive, and general attitude questionnaires in random order. Then participants completed the mood scale, the attention questionnaire, and the subjective awareness questionnaire in this order. In the main study, the mood scale was to be used to determine if the effects of the conditioning phase on attitude towards Patricia or forgiveness was mediated by mood, and I would use the attention questionnaire to determine if attention moderated the effects of the conditioning phase of the study. I included a measure of subjective awareness in the main study because it could impact the development of theory, and because such measures are commonly used in studies involving subliminal conditioning (e.g., Bunce et al., 1999; Dijksterhuis, 2004; Krosnick et al., 1992). I included these last three questionnaires in the pilot studies to provide an opportunity to identify any potential problems with the scales (e.g., if participants found the wording of an item confusing, or if the computer did not properly record their responses), and therefore I did not analyze them.

Participants then completed the forced choice identification task. Recall that this task was to be used to determine if the affective stimuli used during the conditioning phase of the main study could be identified by participants. It could be reasoned that if participants can correctly identify stimuli similar to the affective stimuli exposed for the same amount of time during this task, they are likely to have been able to identify the affective stimuli used during the conditioning phase of the study. During each trial of the task, the computers exposed one of two photographs (one of a kitten and one of a snake) for approximately 30ms (depending on the refresh rate of each individual computer screen; the same amount of time that each of the affective stimuli were exposed during conditioning phase of the study) and the computers prompted participants to guess which
photograph it was. Each time the computers exposed the photograph it was followed by a 500ms exposure of the same mask used during the conditioning phase of the study. The computers displayed this mask before the forced choice identification task began and instructed participants to ignore its appearance on the screen.

During the first stage, consisting of 20 trials, the computers only informed participants that one photograph was of a kitten and that the other photograph was of a snake by written instruction. Before the second 20-trial stage of the task, the computers displayed each of the two photographs and allowed participants to examine them for as long as the participants desired. I included this task in this pilot study only to ensure that the programming was running as intended and therefore did not analyze it.

Next participants rated the potential attribute stimuli for the GNAT. The computers displayed each photograph one at a time and instructed participants to indicate the extent to which they could quickly and easily categorize it as "good" or "bad". The response scale, ranging from "Very Clearly Bad" at 1 to "Very Clearly Good" at 10, remained on the screen with each stimulus until the participant made their selection.

Finally, the computers instructed participants to indicate their ages and sexes before I debriefed them.

Results

Participants in the positive and negative affective conditions did not significantly differ in their scores on any of the attitude scales; for cognitive attitude $t(40) = -1.57, p = .124$; for affective attitude $t(40) = -1.14, p = .262$; for general attitude $t(40) = -0.67, p = .506$ (see Table 3 for means and standard deviations).
Table 3

Means and Standard Deviations for Attitude Scales Across Condition in Pilot Study 2

<table>
<thead>
<tr>
<th>Attitude Scale</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 22</td>
<td>n = 20</td>
</tr>
<tr>
<td>Cognitive</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td></td>
<td>0.41 (0.33)</td>
<td>0.55 (0.25)</td>
</tr>
<tr>
<td>Affective</td>
<td>0.25 (0.32)</td>
<td>0.36 (0.26)</td>
</tr>
<tr>
<td>General</td>
<td>0.47 (0.38)</td>
<td>0.54 (0.31)</td>
</tr>
</tbody>
</table>

Note. N = 42. Cognitive = cognitive attitude towards Patricia; Affective = affective attitude towards Patricia; General = general attitude towards Patricia.

The majority of the participants indicated that they did not see or were unable to identify the affective stimuli. Several others mentioned images that were not shown or other things seen during the slideshow (e.g., images of Patricia, or the cross-hair). Five participants gave responses that could refer to an affective image. For example, one participant responded “thought i saw someone walking down the street” and a second participant responded “couples other strangers.” One of the affective stimuli was an image of a couple walking down a street.

Discussion

As mean scores on the attitude scales did not significantly differ between conditions I determined that the conditioning phase of the second pilot study, intended to manipulate implicit associations, had failed. In order to correct this problem I adopted an alternative approach to creating conditioned associations for the third pilot study. Recall, that although using subliminal stimuli for the conditioning is the clearest approach to creating System 1 content, any effect of repeatedly pairing affective stimuli with
photographs of a hypothetical offender on forgiveness would have to occur through System 1 processing. This is because there is no rational or rule-based reason that one should choose (as System 2 processes are deliberate) to be more or less forgiving after seeing stimuli paired in this way. Therefore, I decided to attempt to create the required (for the purposes of the main study) associations using affective stimuli that could easily be observed at a conscious level. I conducted the third pilot study in order to determine if this alternate form of conditioning would be effective.
Pilot Study 3

Method

Participants. I recruited 48 participants through a psychology research participation website, through posters that I placed throughout a midsized university in Ontario, Canada, and by word of mouth (38 women, 9 men, 1 did not indicate sex; M age = 20.56, SD = 2.29, range = 18-28). Participants received course credit or $10 for their time.

Procedure. The third pilot study followed the same procedure as the second with the following exceptions. First, the computers displayed the affective stimuli for 1 second each. Second, as these stimuli were no longer intended to be subliminal, no mask was used or mentioned in the instructions. Third, in Pilot Study 2, affective stimuli had been displayed before stimuli representing the offender to replicate Krosnick et al.’s (1992) methodology using subliminal stimuli; however, unconditioned stimuli more traditionally follow conditioned stimuli. Thus, computers displayed the affective stimuli in Pilot Study 3 after the photos of the offender rather than before. Finally, participants did not rate stimuli intended for the GNAT.

Results

Participants in the positive and negative affective conditions did not significantly differ in their scores on any of the attitude scales; for cognitive attitude $t(46) = 0.14, p = .887$; for affective attitude $t(46) = 0.22, p = .825$; for general attitude $t(46) = 0.50, p = .620$ (see Table 4 for means and standard deviations).
### Table 4

*Means and Standard Deviations for Attitude Scales Across Condition in Pilot Study 3*

<table>
<thead>
<tr>
<th>Attitude Scale</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n = 24$</td>
<td>$n = 24$</td>
</tr>
<tr>
<td><strong>M (SD)</strong></td>
<td><strong>M (SD)</strong></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>0.55 (0.28)</td>
<td>0.54 (0.30)</td>
</tr>
<tr>
<td>Affective</td>
<td>0.37 (0.30)</td>
<td>0.35 (0.35)</td>
</tr>
<tr>
<td>General</td>
<td>0.55 (0.21)</td>
<td>0.52 (0.29)</td>
</tr>
</tbody>
</table>

*Note. N = 48. Cognitive = cognitive attitude towards Patricia; Affective = affective attitude towards Patricia; General = general attitude towards Patricia.*

### Discussion

The conditioning phase of Pilot Study 3 failed to produce the required effects. In an attempt to remedy this problem, I selected new affective stimuli, which had been standardized and rated in multiple previous studies, from the international affective picture system (IAPS; Lang, Bradley, & Cuthbert, 2008) for use in the main study. As these standardized stimuli were more likely to reliably evoke the same emotional reactions across participants as compared to stimuli only rated in a single pilot study (as our potential attribute stimuli for the GNAT had been), I chose stimuli from the IAPS for use as the attribute stimuli in the GNAT as well. I also decided to use the originally planned subliminal conditioning in the main study because the third pilot study failed to provide evidence that conditioning would be more effective with consciously accessible stimuli.
Due to time restrictions, the altered method for creating conditioned attitudes could not be piloted. I ran several volunteers through parts of the procedure to assist in final adjustments before recruiting participants for the main study. I used this informal testing to adjust the instructions, stimuli, and timing of the GNAT to avoid unnecessary ambiguity, and to adjust the procedure used for the WML manipulation to encourage those in the WML condition to rehearse the numbers as intended. I asked some of these volunteers to complete the conditioning phase of the study to determine the visibility of the affective stimuli. These volunteers indicated that, although they could occasionally see that something was being displayed on the screen between some images of Patricia during the conditioning phase, the affective stimuli were not identifiable.
Main Study

Method

Participants. I recruited 217 participants through a psychology research participation website, and through posters that I placed throughout a midsized university in Ontario, Canada (185 women, and 32 men; $M_{age} = 19.65, SD = 2.60$, range = 17-37; one participant did not indicate her age). After preliminary screening (see Results section), the final sample contained 149 participants (130 women, and 19 men; $M_{age} = 19.34, SD = 1.56$, range = 18-25). Of the participants in the final sample, 133 (89.26%) were completing their bachelor degree, 82 (61.65 %) of which were in their first year. All participants had graduated from high school or an equivalent program that allowed them to enrol in post-secondary education. When asked for their religious background, 72 reported that they were Catholic, 17 Protestant, 4 Eastern Orthodox, 4 Sikh, 3 Buddhist, 2 Jewish, 2 Muslim, 1 Hindu, 20 reported another religious affiliation, and 43 indicated no religious affiliation (15 participants indicated two religious affiliations, one participant indicated five religious affiliations, and one participant indicated 6 religious affiliations). Participants received course credit for participation or $10 for their time.

Materials. Cronbach’s alpha in the main study was .86 for the BMIS, .80 for the general attitude scale, .84 for the affective attitude scale, and .79 for the cognitive attitude scale. In addition to the attitude, mood, attention, and subjective awareness questionnaires described in Pilot Study 2, I used several additional questionnaires in the main study.

I constructed a scale measuring how participants believed they would behave
towards Patricia using the same format as the affective, cognitive, and general attitude scales. I created this measure, which I will refer to as the behaviour scale, as a parallel to the affective and cognitive attitude scales so that the relative roles of affect, cognition, and behaviour in forgiveness as well as in each of the two systems could be explored. For this scale, the computers instructed participants to “please indicate whether or not each word describes your future behaviour toward PATRICIA by clicking on the corresponding number.” Example items include “Warm,” and “Avoidant”. Participants could choose from the responses “Definitely Describes My Behaviour,” “Slightly Describes My Behaviour,” “Does not Describe My Behaviour,” and “Not Applicable.” On the display, these options corresponded to the labels 2, 1, 0 or NA, however, I scored positively valenced items 2, 1, 0, and 0, respectively, and negatively valenced items -2, -1, 0 and 0, respectively. Higher scores on this scale indicate more positive behaviour, towards Patricia. Cronbach’s alpha in the current sample was .80.

I used the 18-item Transgression-Related Interpersonal Motivations Inventory (TRIM; McCullough, & Hoyt, 2002; McCullough, Root, & Cohen, 2006)), which I altered to place the item “I forgive her for what she did to me” first (and all other items in random order), to measure forgiveness. The scores on the first item constituted the main dependent variable of interest: forgiveness as defined by the participant. I placed this item first to keep the other items from influencing how participants defined forgiveness (or communicating to the participants that I wanted it to be defined a certain way) when they answered this question. I also used the entire TRIM and both its (5 item) Revenge and (13 item) Avoidance/Benevolence subscales (based on the factor analysis in McCullough, Root, & Cohen, 2006) in my main analyses so that my findings could be easily compared
to other research that has used these scales (I will refer to the Avoidance-Benevolence subscale as just the Avoidance subscale for the remainder of this paper). For these scales, the computers instructed participants to rate their agreement with each item on a scale of 1 to 5, 1 being “Strongly Disagree,” and 5 being “Strongly Agree.” Example items include “I wish something bad would happen to her,” from the revenge subscale, and “I am trying to keep as much distance between us as possible” and “Even though her actions hurt me, I have goodwill for her” from the Avoidance subscale. For each of these forgiveness scales, higher scores indicate more forgiveness (or less avoidance or revenge). In the current sample, Cronbach’s alpha was .90 for the entire questionnaire, .79 for the Revenge subscale, and .87 for the Avoidance subscale.

I created the working memory load maintenance questionnaire to measure the degree of effort required and put into memorizing the digits by mentally rehearsing them. It consisted of two items to be analyzed separately. The first item asked “How hard was it to remember the numbers you were asked to memorize?” providing a response scale from 1 to 5, 1 being “Very Easy,” and 5 being “Very Hard.” For participants in the WML condition the second question asked “Were you rehearsing the numbers in your mind as you completed the study?” Keeping the numbers within one’s working memory should only affect our results when done concurrently with the measures of interest, and the computers prompted participants in the no-WML condition to recall the numbers before they had completed any of these measures, so I changed the wording of this second item slightly for these participants. For participants in the no-WML condition, computers displayed the question “Were you rehearsing the numbers in your mind as you completed the study, even after you were asked to recall the numbers?” This item could then be used
to identify participants in the no-WML who continued to rehearse these numbers while completing the subsequent measures, simulating the WML condition, without being asked to do so. Participants in both conditions could choose from the responses “No, or hardly at all,” “Yes, once in a while,” and “Yes, constantly, or almost constantly.” When used as an ordinal scale, I scored these responses 1, 2, and 3 respectively.

I used the Tendency to Forgive Scale (TTF; Brown, 2003), to measure individual differences in forgivingness for use as a control variable. This four item scale asks participants to rate their agreement to statements on a seven point scale, anchored by “Strongly Disagree” at 1, and “Strongly Agree” at 7. Example items include “I tend to get over it quickly when someone hurts my feelings” and “I have a tendency to harbour grudges”. Higher scores on this scale indicate a greater tendency to forgive. Cronbach’s alpha in the current sample was .74.

To assist in screening participants, I constructed the transgression comprehension scale to identify individuals who did not fully read or comprehend the hypothetical transgression. It asked first “in the offence described, what did Patricia offer to do for you?” and second “What distracted Patricia from doing what she said she would do?” using an open-ended response format for each.

I constructed a final questionnaire to assess several variables related to forgiveness and the transgression. The first item asked “Forgiveness’ Means different things to different people. What does it mean to you?” and provided a space for participants to describe their personal definitions of forgiveness. This questionnaire also included a measure of attitude towards forgiveness itself and a measure of attitude towards the nature of the transgression. The inclusion of these items provided the
opportunity to use them as control variables if necessary. One item asked “Independent of circumstance, how good or bad would you say forgiveness is in general?” to measure attitude towards forgiveness itself. Participants responded on a scale of 1 to 7, with the anchor “Very Bad” at 1, and “Very Good” at 7. Further, I used five items to measure attitude towards the nature of the transgression, using the same response scale as the attitude towards forgiveness item. Example items from this scale include “In general, how good or bad is it when a friend breaks a promise?” and “In general how good or bad is it when you miss out on an opportunity?” (reverse scored). Higher scores on this scale indicate a more positive (or less negative) attitude towards the nature of the transgression. The Cronbach’s alpha for this scale was .59. It should be noted that the scale should not have high internal consistency because each item assesses attitude towards different aspects of the transgression.

As experiences with a similar transgression might create associations with the nature of the transgression, and therefore affect forgiveness, two items inquired into such experiences. The first asked “Have you ever experienced an offence similar to that described in the study (i.e. has anyone behaved towards you as Patricia did in the story)?” to which participants could respond “Yes” or “No,” (a space to explain how the transgression was similar was also provided for those who responded “Yes”). Participants who responded “Yes” then rated how hurtful this experience had been on a scale of 1 to 5, 1 indicating “Not at all [hurtful]”, and 5 indicating “Very hurtful.” When scoring, I collapsed the two items together such that I gave a score of 1 to participants who had indicated that they had not had such an experience, and gave the remaining participants a score corresponding to how hurtful their experience had been.
The remaining items asked participants about their experiences with forgiveness for exploratory analysis and future research. Two of these items asked participants to describe the last time they forgave and why, and the last time they did not forgive and why. Several items addressed experiences with inner conflict during forgiveness. The computers instructed participants to indicate if they had ever believed they had forgiven someone but found that they were still angry from time to time. The computers then instructed those who had answered “yes” to describe the experience, including whether or not it surprised or troubled them, whether it made them doubt if they had actually forgiven, and if experiencing mixed thoughts and feelings when forgiving was a common experience for them, using an open-ended response format. The computers then presented the same questions regarding an experience in which the participant thought they had not forgiven, but still felt love or affection for the offender from time to time. Next, the computers presented participants with the questions “When you forgive, do you ALWAYS feel that every part of you has forgiven?” and “Once you have made a decision as to whether or not you forgive, do you find that all your thoughts and feelings agree?” For of these questions participants could respond “Yes, certainly,” “I am not sure,” or “No.”

The feedback questionnaire consisted of three items assessing participants’ thoughts and beliefs about the study. I used the first two items to determine if participants suspected the true nature of the study, including the purpose of the conditioning phase of the study. These questions asked “What do you think was the purpose of this study?” and “What do you think are the researchers' hypotheses for this study?” The third item was used to determine if any participant had misunderstood the instructions in the study, and
to obtain suggestions for future research. This item instructed participants “We appreciate the time you have taken to complete this study. As our methods are constantly being developed we would be interested to hear any comments you have on the study or your experience of forgiveness. Please let us know if you found any of the directions confusing or if you feel we could have improved the study in another way”.

The demographics questionnaire inquired into the age, sex, education, marital status, citizenship, ethnicity, religion, and religiosity of each participant. To explain the need for such personal information participants were told the following:

Thank you for participating in this research. Scientific journals require researchers to provide basic descriptions of participants, so that other scientists can judge how generalizable the results are. We would therefore appreciate receiving the following information about you before the study is complete.

Procedure. For a flow chart of the procedure see Figure 1. I presented all questions by computer. Responses could be entered by keyboard or mouse. I tested participants in groups of 4 to 8. After participants had carefully read and signed the consent form, I directed each participant to a computer. All of the remaining instructions were displayed on the computer monitor until the participant was ready to be debriefed.
Figure 1. Procedure for main study.
The first set of instructions, including text that I adapted from Krosnick et al. (1992, p.155), provided explanations for some of the tasks that would be performed, as well as the appearance of the affective stimuli used in the conditioning phase of the study (which were more likely to be perceived than those displayed for a shorter interval in Krosnick et al., 1992). The majority of these explanations were false, meant to obscure the actual nature of the study. The instructions, displayed one paragraph at a time, were as follows:

This study will be examining the effects of memory and previous relationships on forgiveness. Many studies of forgiveness ask you to imagine a story or scenario—we will be doing that too. However, the problem with this approach is that it may be perceived as artificial. Therefore we would like to try and make it more real by having you watch a slideshow that simulates past experience in a relationship with an individual named Patricia. The slide show will consist of photographs of Patricia going about her daily activities. Please watch these pictures in a relaxed but attentive manner.

Please press the spacebar to continue.

Each slide will be exposed for a very short interval. It is important that you keep your eyes on the center of the screen between slides so that you can see as many details as possible when the next slide appears. A cross hair will appear on the screen between images to help you maintain focus. The cross hair will appear on a swirled background used to prepare your vision for the next slide (pictured below). You may ignore this swirled image.

Please press the spacebar to continue.

Since we are also interested in the role of attention some participants will be in what we call "the distractor condition." For these participants the slideshow will serve a second purpose: to test the effects of distractions. In this condition, various images will be randomly flashed for very short intervals during the slideshow. If you find yourself in this condition it is your task to ignore these images as best you can. Remember, the main purpose of this slide show is to get you to form a broad impression of Patricia as if you had known her for some time.

Please press the spacebar to continue.

The conditioning phase of the study then proceeded as described in Pilot Study 2, using the selected IAPS as affective stimuli (#1601, #1602, #2070, #2091, #4597, #4599,
#5010, #5870, #7270, and #8120 for the positive affective condition, and #1300, #2900, #3010, #3053, #3160, #3261, #3300, #3400, #3550, and #9300 for the negative affective condition).

Following the conditioning phase of the study, the computers instructed all participants to memorize a series of 10 random digits (the same digits were used for all participants):

We are now going to show you a series of numbers. Please memorize them. After you have completed a few other activities within the study we will ask you to recall as many of these numbers as possible in the order that they were presented to you. You may find it challenging, but try your best.

The computers displayed the digits for one second each with a one second interstimulus interval. When participants indicated that they were ready, the computers displayed the numbers a second time. The computers then displayed the instructions “it is VERY important that you not forget these numbers until we ask you to recall them later in this study. Your performance will be evaluated based on the number of digits you can remember correctly. If you find you have forgotten some numbers please continue to keep the remaining numbers in your memory as best you can.” I added these prompts to the procedure when volunteers failed to rehearse the numbers during the informal testing conducted after Pilot Study 3. The computers prompted half of the participants (approximately evenly split across affective condition), placed in the no-WML condition, to recall these digits after a 20 second interval. The computers prompted the remaining participants, placed in the WML condition, to recall the numbers towards the end of the study. Until this time, after each of the questionnaires the computers reminded the participants in the WML condition to not forget the numbers.
At this time the computers displayed the reference photograph of the woman depicted in conditioning phase of the study on the screen with the instructions “this is a photograph of Patricia, whom you saw in the slide show earlier in the study. Please imagine that Patricia is your friend and the following narrative has recently happened to you.” The computers presented the following hypothetical transgression, adapted from the Transgression Narrative Test of Forgiveness (Berry, Worthington, Parrott, O’Connor, & Wade, 2001), to all participants:

Your friend Patricia offers to drop off a job application for you at the post office by the deadline for submission. A week later, you get a letter from the potential employer saying that your application could not be considered because it was postmarked after the deadline and they had a very strict policy about this. Patricia said that she met an old friend, went to lunch, and lost track of time. When she remembered the package, it was close to closing time at the post office and she would have to have rushed frantically to get there; she decided that deadlines usually aren’t that strictly enforced so she waited until the next morning to deliver the package.

The computers then presented the instructions “The following questions refer to PATRICIA. Please keep her and the recent offense described in mind as you complete these questions” before presenting the measures of forgiveness and attitude. The computers presented the forgiveness measure first, followed by the affective, cognitive, general and attitude measures, and the behaviour measure in random order. Each of these measures were accompanied by the reference photo of Patricia. After these measures were complete, the computers administered the mood scale.

The computers then prompted participants in the WML condition to recall the numbers they had memorized.

Next, a measure of implicit attitude towards Patricia was obtained. Before the GNAT began, the computers presented the participants with a simple task to get them used to the mechanics of the GNAT, and to get a baseline rate of how quickly each
participant could respond. The computers presented the following instructions “We will now begin with a simple task. Once you press the spacebar pictures of two shapes will be rapidly displayed on the screen in turn: a picture of a triangle and a picture of a rectangle. In this round we would like you to press the spacebar as fast as you can if you see a picture of a rectangle, and press nothing if you see a picture of a triangle. The word ‘rectangle’ will remain at the top of the screen to remind you what you are looking for.”

The computers displayed small copies of the image of the white rectangle on a gray background, and the image of the white triangle on a gray background below the instructions for the participants’ reference.

The task proceeded as described with 20 trials in which the participant was to press the spacebar (the “Go response”) in response to the rectangle, before the computers instructed the participants to switch and respond instead to the triangle for 20 trials. Detailed information on this task, including the number of times items from each category is displayed can be found in Table 5. For both this baseline task and the GNAT, the computers displayed a green circle on the screen for 500ms each time a participant made the correct response and displayed a red “x” on the screen for 500ms each time a participant made the incorrect response.
Table 5

Summary of Design for Baseline Task

<table>
<thead>
<tr>
<th>Block</th>
<th>Stimulus presented</th>
<th>Required response</th>
<th>Response deadline (ms)</th>
<th>No. trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rectangle</td>
<td>Go</td>
<td>1200</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Triangle</td>
<td>No-Go</td>
<td>1200</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triangle</td>
<td>Go</td>
<td>1200</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Rectangle</td>
<td>No-Go</td>
<td>1200</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>

The GNAT that followed consisted of three practice blocks and two critical blocks. During one practice block the computers instructed the participants to give the Go response to photographs of Patricia and used images of “Good” and “Bad” things as distractor images requiring the No-Go Response. In another block “Good” images required a Go response and the computer used “Bad” images as distractors, and in a third block “Bad” images required a Go response and “Good” images a No-Go response. In each of the practice blocks the word “Patricia,” “Good,” or “Bad” remained at the top left corner of the screen to remind the participant which category required a Go response. Although the practice blocks were always presented before the critical blocks, the order of the individual blocks and the trials within them was randomized.

During the two critical blocks the task became slightly more complex. Rather than giving the Go response to one category and the No-Go response to two, the computers instructed the participants to give the Go response to two categories and the No-Go response to one. During one block the computer assigned the Go response to the Patricia
and "Good" categories, and during the other block the computer assigned the Go response to the Patricia and "Bad" categories. To allow participants to become accustomed to giving the Go response to two categories, and therefore to reduce error variance, each block began with 21 practice trials, which would not be used to calculate reaction time.

For the practice block the stimulus used to represent Patricia on all trials was the reference image presented throughout the explicit attitude measures. During the critical blocks (including the practice trials), the images of Patricia going about her day used during the conditioning phase represented Patricia. The same 10 positive valence IAPS images and 10 negative valence IAPS images represented "Good" and "Bad" throughout the practice blocks (randomized such that an image would only appear no more than once per block). Similarly, the same six images of Patricia appeared in both sets of practice trials. The 15 negative and 15 positive valence IAPS images used during the practice trials were separate images from those used during the critical trials.

Following the advice of Nosek and Banaji (2001), I set the response deadlines for critical trials requiring a Go response to twice the length as those trials requiring a No-Go response. This allowed for a larger range of RT scores (by including slower Go responses), while encouraging participants to continue to respond as quickly as possible due to the speed of the No-Go response trials. Detailed information on the GNAT, including response deadlines, can be found in Table 6.
<table>
<thead>
<tr>
<th>Block Type</th>
<th>Stimuli Presented</th>
<th>Required Response</th>
<th>Response Deadline (ms)</th>
<th>No. Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice Block 1</td>
<td>Patricia</td>
<td>Go</td>
<td>1200</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>No-Go</td>
<td>1200</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>No-Go</td>
<td>1200</td>
<td>5</td>
</tr>
<tr>
<td>Practice Block 2</td>
<td>Good</td>
<td>Go</td>
<td>1200</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>No-Go</td>
<td>1200</td>
<td>10</td>
</tr>
<tr>
<td>Practice Block 3</td>
<td>Bad</td>
<td>Go</td>
<td>1200</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>No-Go</td>
<td>1200</td>
<td>10</td>
</tr>
<tr>
<td>Critical Block 1</td>
<td>Patricia</td>
<td>Go</td>
<td>1200</td>
<td>6</td>
</tr>
<tr>
<td>Practice Trials</td>
<td>Good</td>
<td>Go</td>
<td>1200</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>No-Go</td>
<td>600</td>
<td>9</td>
</tr>
<tr>
<td>Critical Trials</td>
<td>Patricia</td>
<td>Go</td>
<td>1200</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>Go</td>
<td>1200</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>No-Go</td>
<td>600</td>
<td>36</td>
</tr>
<tr>
<td>Critical Block 2</td>
<td>Patricia</td>
<td>Go</td>
<td>1200</td>
<td>6</td>
</tr>
<tr>
<td>Practice Trials</td>
<td>Bad</td>
<td>Go</td>
<td>1200</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>No-Go</td>
<td>600</td>
<td>9</td>
</tr>
<tr>
<td>Critical Trials</td>
<td>Patricia</td>
<td>Go</td>
<td>1200</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>Go</td>
<td>1200</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>No-Go</td>
<td>600</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>270</td>
</tr>
</tbody>
</table>
Participants then completed the working memory load maintenance questionnaire, the attention questionnaire, the subjective awareness questionnaire, the forced choice identification task (described in Pilot Study 2), the tendency to forgive scale, the transgression comprehension questionnaire, and the final questionnaire on experiences and attitudes related to forgiveness, in the stated order. The computers prompted participants to indicate if they had ever known someone named Patricia before instructing participants to complete the feedback and demographics questionnaires. Finally, the computers instructed participants to report back to the researcher (myself) to be debriefed. Copies of all questionnaires can be found in Appendix A.

I had the measures presented in this order to preserve the integrity of those measures most central to the study. For example, it is possible that the effects of the experimental manipulations would degrade over time. Thus, to increase the likelihood that these effects would still be captured by the forgiveness measure, which addresses the main questions posed by this research, the forgiveness measures were the first to be presented after the transgression. Further, by presenting the main dependent measures before the GNAT, I avoided the possibility that the GNAT would alter the effects of the conditioning phase of the study, as, much like the conditioning phase of the study, the GNAT involves presenting pleasant and unpleasant photographs and photographs of the transgressor in rapid succession.

Results

Please note that, as in the pilot studies, I used mean scores on each scale in all analyses (rather than total scores) so that participants missing less than 10% of items on a scale could be retained without these missing items greatly affecting their scores.
**Preliminary analyses.** Before performing the analyses of interest, I screened the data for cases that could potentially affect the accuracy of the results, and tested the assumptions required for these analyses. I have described this screening in the following sections.

*Univariate outliers.* I screened relevant variables (the single-item forgiveness scale, the TRIM, the Revenge and Avoidance subscales of the TRIM, the BIS, the Tendency to Forgive Scale, the measure of experience with the transgression type, the attitude towards the transgression type measure, the measure of attitude towards forgiveness, the behaviour scale, and the measures of affective, cognitive and general attitude towards Patricia) for univariate outliers, separately for each of the four conditions, and across all conditions. I identified scores as potential outliers if they had z-scores with absolute values larger than 3.3 and were at least one half standard deviations from the next furthest point from the mean. For single-item scales, I also required that a score be at least 2 response levels from the next nearest score to be considered a potential outlier.

I identified one outlier on the BMIS within the negative affect and WML conditions which had a z-score of -3.41 and a mean of 1.38. I found no evidence to indicate that this participant did not belong in the current sample when I examined the comprehension scores, feedback, memorization practices, reported age, and other demographic information pertaining to this participant, nor did this participant have extreme scores on any other scale. I adjusted this outlier to a new score of 1.43. I

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2 Due to experimenter error this score was returned to its original value when screening for multivariate outliers and normality, however, it was again adjusted to 1.43 to screen for univariate normality and for the main and exploratory analyses.
selected this value because it maintained rank order of all scores on the BMIS across all conditions but is within 3.3 standard deviations (based on the original data) of the mean.

I identified a second potential outlier for attitude toward forgiveness, which had a z-score of -3.6 and a mean of 1. As with the previous outlier, I found no evidence to indicate that the participant did not belong within the sample. I retained the outlier with its original value because scores on single-item scales can be expected to be less reliable and therefore more variable. I identified one final outlier on the measure of attitude towards characteristics of the situation, which had a z-score of 4.95 and a mean of 5.80. A careful examination of the participant’s responses suggested that this response was invalid. In response to an unrelated question the participant expressed that the nature of the transgression was particularly harmful, in direct contrast with the positive attitude toward similar transgressions indicated by a score of 5.80. Further the participant, placed in the no-WML condition, indicated that she rehearsed the numbers displayed to her throughout the entire study. For these reasons I removed this participant from the sample for the remainder of the analyses.

Comprehension and manipulation checks. Next, I screened the data for participants who did not comply with or understand instructions as expected. Participants who did not fully read or comprehend the transgression could not be expected to respond to any of the following measures in the same fashion as those who did. A large proportion of participants (63 of 217) were unable to correctly answer the question “in the offence described, what did Patricia offer to do for you?” suggesting that the question could be easily misunderstood, rather than that these participants did not read or understand the transgression. The fact that many participants had answered that Patricia
had offered them nothing, or had not apologized, led me to believe that it was possible that many of the participants were focused on what happened after the transgression, and may have forgotten that Patricia had offered to drop off the job application, rather than that the participant had asked. Further, many of these participants (48) were able to answer what had distracted Patricia from her task, implying that they knew what the task was. I removed the 15 participants who incorrectly answered both questions from the sample. These participants were approximately equally distributed across condition.

There was also evidence that the WML task was not carried out as intended. When asked if they had rehearsed the numbers to be memorized in their mind as they completed the study, 23 of the 102 participants in the WML condition selected the answer “no, or hardly at all.” When asked if they had rehearsed the numbers in their mind as they completed the study, even after they were asked to recall the numbers, 57 of the 99 participants in the no-WML condition selected the answer “yes, constantly, or almost constantly” or “yes, once in a while.” In order to ensure that those in the WML condition were more likely to be dividing their attention across multiple tasks, and therefore more likely to be using automatic processing, I removed the 21 participants who answered “yes, constantly, or almost constantly” in the no-WML condition, and the 23 participants who answered “no, or hardly at all” in the WML condition from the sample (for an evaluation of the effect of WML based on reported rehearsal with these participants retained see Additional Analyses)³.

³ Removing these participants did not meaningfully affect the main results: when the main analysis is performed with these participants retained, using the single-item forgiveness scale as the dependent variable, there is no significant main effect for WML condition, t(179) = 1.22, p = .225, or for affective condition, t(179) = 1.05, p = .293. The interaction between these conditions also fails to account for significant variance in forgiveness, t(178) = -1.86, p = .064. Within the WML condition, the forgiveness scores of those in the negative affective condition did not significantly differ from those in the positive affective condition, t(94) = -0.21, p = .832, with mean single-item forgiveness scores of 3.13 (SD = 1.04)
I further analyzed the data to determine the proportion of participants who could correctly recall the 10-digit number used for the WML manipulation. In the no-WML condition, in which participants were asked to recall these digits 20 seconds after they were memorized, 24 participants in the final sample (or 32.43% of those in no-WML condition) correctly recalled all 10 digits in the correct order. In the WML condition, in which participants were asked to recall these digits after completing the main measures of interest, 15 participants in the final sample (20.00% of those in WML condition) correctly recalled all 10 digits in the correct order. When I tested the difference between these two groups, the assumption of homogeneity of variance was violated. For Levene’s Test for Equality of Variances, $F(1, 147) = 12.12, p = .001$. Therefore, I used the Welch-Satterthwaite method, adjusting the degrees of freedom from 147 to 143. The difference between these two groups was not significant, $t(143) = -1.73, p = .085^4$.

I also calculated a continuous measure of recall accuracy allotting 1 point for every correct digit in the correct position, and one half points for every correct digit in a position directly adjacent to the correct position. This measure did not significantly correlate with reported rehearsal amongst participants in the WML condition, $r = -.02, p = .812$. Mean scores for the WML condition and the no-WML condition were 7.21 ($SD = 2.32$) and 8.03 ($SD = 1.90$) respectively. When I tested the difference between these two

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and 3.08 (0.87). This difference was also not significant in the no-WML condition, $t(92) = 1.66, p = .099$. In the no-WML condition, the mean single-item forgiveness score for those in the negative affective condition was 3.06 ($SD = 2.77$, $SD = 0.86$) and the mean single-item forgiveness score for those in the positive affective condition was 3.07 ($SD = 0.87$). When the same analysis is performed with the full TRIM there are no significant effects for WML, $t(179) = 0.95, p = .343$, affective condition, $t(179) = -0.75, p = .456$, or the interaction $t(178) = 0.14, p = .887$.

4 If those participants who rehearsed the digits in a manner other than intended are included in this count, 30 (31.91%) of the participants in the no-WML condition, and 22 (22.9%) of participants in the WML condition correctly recalled all ten digits in the correct order. When I tested the difference between these two groups, the assumption of homogeneity of variance was violated. For Levene’s Test for Equality of Variances, $F(1, 188) = 7.71, p = .006$. I therefore used the Welch-Satterthwaite method, adjusting the degrees of freedom from 188 to 185. The difference between these two groups was not significant, $t(185) = 1.39, p = .166$. 

---
groups, the assumption of homogeneity of variance was violated. For Levene’s Test for Equality of Variances, $F(1, 147) = 4.24, p = .041$. Therefore, I used the Welch-Satterthwaite method, adjusting the degrees of freedom from 147 to 142. The difference between these two groups was significant, $t(142) = -2.36, p = .020$.\(^5\)

Responses to two probes were examined for indications of the extent to which participants could consciously and accurately perceive the images used for the conditioning stage of the study. When asked if they saw anything strange during the slideshow 108 (72.48%) of the participants responded yes. When asked to describe what they saw that was strange 8 responded that they could not tell or could not remember what the images were, 21 gave a response that did not provide information about the content of the image (e.g. “pictures”), 33 described another element of the study (e.g. an image from the GNAT), and 2 described images that did not appear at any point during the study (e.g. “subliminal [sic] messages”). This left a total of 44 participants (29.53% of the entire sample) that provided an accurate descriptions of at least one of the photos.\(^6\).

Accurate descriptions of images included “teeth,” “faces,” “a couple,” and “little boy.” The majority of descriptions focused on the same images; the photograph of the little boy and of the dog (with exposed teeth) in the negative affect condition, and the photograph of the couple about to kiss and the infant in the positive affective condition. When asked, more specifically, if they had seen any images flash on the screen before the target and

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\(^5\) When those participants who rehearsed the digits in a manner other than intended are included in the analysis the mean combined recall scores for the WML condition and no-WML condition are 7.33 (SD = 2.32) and 8.02 (SD = 1.89) respectively. When I tested the difference between these two groups the assumption of homogeneity of variance was violated, $F(1, 188) = 6.15, p = .014$. I therefore used the Welch-Satterwaite method, adjusting degrees of freedom from 188 to 182. The difference between these two groups was significant, $t(182) = 2.23, p = .027$.

\(^6\) Several participants in the positive affect condition stated that they saw a bride and groom; although no photo of a bride and groom was included, I counted this answer as correct because the photo of the couple about to kiss could be perceived as a wedding photo.
images of Patricia similar answers were provided; 119 (79.86%) of participants responded “yes,” 86 of which (57.72% of the entire sample) could provide an accurate description.

I then analyzed the two-stage objective awareness measure. When participants were asked to indicate if a photo was of a kitten or a snake, without being provided with reference photos, 121 (81.21%) were able to accurately identify the images at a significantly above chance rate (defined as $p < .05$ for each individual). After being allowed to examine the photos for as long as they wanted, 124 (83.22%) of participants correctly identified the photos at a significantly above chance rate. Participants correctly identified the snake stimulus a significantly higher proportion of trials as compared to the kitten stimulus, $t(148) = -3.98, p < .001$. During debriefing, several participants verbally reported that they were unable to distinguish the photographs of the snake and the kitten during the forced choice identification task and guessed randomly at each trial. One participant further indicated that he was only able to identify the photograph of the snake because he could see the colour green when it was displayed.

The primary manipulation in the current study was of the affective content of the conditioning stage of the study. By manipulating attitude towards Patricia in the same manner that Krosnick et al. (1992) manipulated attitudes towards a target person, I hoped that a more positive attitude toward Patricia would in turn make a participant more forgiving. If I had successfully replicated Krosnick et al.’s study, significant differences by affective condition should be observed. Further, it is possible that WML condition would moderate this effect. To check that this manipulation was successful, I performed a 2 X 2 factorial ANOVA. Affective condition and WML condition were the independent
variables, and general attitude was the dependent variable. There was no significant effect for affective condition or the interaction, $F(1, 145) = 0.19, p = .667$, and $F(1, 145) = 0.75, p = .389$ respectively, suggesting that our manipulation was ineffective. I found an unexpected main effect for WML, $F(1, 145) = 4.76, p = .031$ (see Table 7 for the means and standard deviations for each attitude scale in each condition). I observed similar findings when using affective attitude or cognitive attitude instead of general attitude, with the exception that the main effect for WML fell just short of significance.
Table 7

*Means and Standard Deviations for Attitude Scales by Condition*

<table>
<thead>
<tr>
<th>Scale</th>
<th>General</th>
<th>Cognitive</th>
<th>Affective</th>
<th>WML</th>
<th>No-WML</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 33</td>
<td>0.24 (0.39)</td>
<td>0.11 (0.33)</td>
<td>-0.02 (0.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>0.21 (0.39)</td>
<td>0.07 (0.33)</td>
<td>-0.06 (0.29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Affective Conditions</td>
<td>0.24 (0.39)</td>
<td>0.09 (0.33)</td>
<td>-0.04 (0.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>0.05 (0.27)</td>
<td>-0.02 (0.24)</td>
<td>-0.17 (0.26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 35</td>
<td>0.13 (0.45)</td>
<td>0.03 (0.31)</td>
<td>-0.10 (0.36)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>0.09 (0.37)</td>
<td>0.01 (0.28)</td>
<td>-0.13 (0.31)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: N = 149. Higher scores indicate a more positive attitude towards the transgressor. General = general attitude towards Patricia; Cognitive = cognitive attitude towards Patricia; Affective = affective attitude towards Patricia.*
**Univariate normality.** I also screened for signs of skewness and kurtosis amongst the same multiple-item measures that I screened for univariate outliers. I again examined the scores separately by condition and in a single distribution. The TRIM was significantly skewed in the WML and negative affect condition with a z-skewness of -3.48. The TRIM’s Revenge subscale was also skewed in the same condition (z-skewness = -3.75), and across all conditions (z-skewness = -3.89). I used a square root transformation to transform the scores for each scale resulting in a z-skewness of 2.35 for the TRIM in the WML and negative affect condition, a z-skewness of 2.61 for the Revenge subscale in the same condition, and a z-skewness of 2.09 for the revenge subscale across all conditions. Neither scale became significantly skewed in any other condition after transformation. I then reflected the scores so that larger values would indicate the same direction of effect as the original scales. See below for the exact calculations used.

Correction for skewness: New TRIM score = \( \sqrt{6 - \text{original TRIM score}} \)

Reflection: Final TRIM score = 3 - New TRIM score

Correction for skewness: New Revenge score = \( \sqrt{6 - \text{original Revenge score}} \)

Reflection: Final Revenge score = 3 - New Revenge score

**Multivariate outliers.** To obtain measures of leverage, global and specific influence, and discrepancy, I used a regression identical to the one that I used in the main analysis (with the single-item forgiveness scale as the dependent variable). The criteria that I used for centered leverage values that would indicate a potential outlier was 3K/N (0.21), and the criteria that I used for Mahalonobis Distance was the critical value for \( \chi^2 \).
with 10 df and p < .001 (31.26). I used Cook’s D values larger than 1 to indicate potential cases of strong global influence and I used values larger than $4/n$ (0.0256) to indicate more minor cases of global influence. In accordance with the recommendation of Beckman and Cook (1983 cited in Cohen, Cohen, West & Aiken, 2003), I used the Bonferroni procedure to determine the value of studentized deleted residuals (externally studentized residuals) that would indicate a potential outlier. Based on the assumption that all 156 scores could potentially be tested, I set alpha at .0032 producing a t-critical value of 3.49. I used standardized DFBetas larger than an absolute value of one to indicate cases of potential specific influence. In addition to these rules of thumb, I plotted centered leverage values, Cook’s D values, and standardized DFBeta values against participant numbers and examined each of these plots separately.

No potential outliers were flagged by rule of thumb for studentized deleted residuals or standardized DF Betas. Two potential outliers, participant #82, and participant #28 were flagged by both centered leverage and Mahalanobis distance as high in leverage, with centered leverage values of .35 and .24 respectively. Although no Cook’s D value was larger than one, seven potential outliers surpassed the more stringent criteria of .0256, one of which was participant #28. An examination of the 11 standardized DFBeta plots revealed 13 potential outliers, including participants #82 and #28.

The responses of participants #82 and #28 were typical in terms of their feedback, beliefs about the study, and number rehearsal habits, however participant #82 was the oldest participant in our sample, at age 37, and participant #28, at age 26, was well above our median age of 19. Only 4.48% of our population was above the age of 25 (n=7). Six...
of these seven older participants had one of the ten highest values for Mahalanobis Distance and stood out on at least one standardized DFBeta graph (as determined before they were identified by age). As our sample did not include enough participants above the age of 25 to determine the generalizability of our findings to other age groups, and because the variables in our analysis appear to relate to each other differently amongst these outliers, I removed participants above the age of 25 from the sample.\(^7\)

*Multivariate normality and other assumptions of multiple regression.* To obtain scatter plots, histograms, and P-P plots to test the assumptions of multiple regression, I used a regression identical to the one that I used in the main analysis, with the single-item forgiveness measure as the dependent variable. The Durbin Watson statistic for this regression, and for all regressions performed in the main analyses, was between our cut-off values of 1.5 and 2.5, with a value of 2.1, indicating that the residuals were independent. In examining scatter plots with standardized predicted value as the x-axis, and standardized residual and studentized deleted residual alternately plotted on the y-axis, I observed no pattern. This suggests that the residuals were fairly normally distributed, that no important predictor or interaction was missing from the model, and that the assumption of homoscedasticity had been met. Similarly a histogram and P-P plot of standardized residuals appeared approximately normal.

*Reaction Time Data Outliers and Normality.* I screened the reaction time (RT) data, and indicators of accuracy obtained by the GNAT separately from the remaining data as this data was to be examined in separate analyses. I removed from the analyses of the RT data three individuals who had indicated in their feedback that they had found the

\(^{7}\) The same coefficients were found to be significant when the main analyses were performed with these participants in the sample.
GNAT confusing, and who were therefore likely to give responses that more strongly reflected error and less strongly reflected their associations with Patricia. I created a measure of accuracy, $d'$, by following the calculations described in the original paper on the GNAT by Nosek and Banaji (2001), who originally adopted this measure from signal detection theory. Empty cells (cases where a participant never responds to a stimulus requiring no response, or never fails to respond to a stimulus requiring a response) make the calculation of $d'$ impossible, therefore I applied the model-sensitive correction described by Banaji and Greenwald (1995). I removed from the analyses of the RT data one outlier whose accuracy during the “bad” block was just above chance level ($d' = .98$), with a $z$-score of -4.16.

I used two measures of relative speed across critical blocks to indicate implicit attitude towards Patricia. The first was a difference score, subtracting median RT score (for a correct response to signal) in the block in which Patricia was paired with good stimuli from median RT score in the block in which Patricia was paired with bad stimuli. Higher raw RT scores indicate longer response time or slower responding. Therefore higher difference scores indicated slower responding in the block in which Patricia was paired with Bad stimuli than in the block in which Patricia was paired with Good stimuli, and therefore a more positive attitude towards Patricia. The second score was a residual score for median RT in the block in which Patricia was paired with bad stimuli, controlling for median RT in the block in which Patricia was paired with good stimuli. I obtained this measure by regressing RT scores from the Patricia-Bad block onto RT scores from the Patricia-Good block and saving the residual. Higher scores therefore indicate a greater delay in responding to stimuli in the block in which Patricia was paired.
with Bad stimuli, or a more positive attitude towards Patricia. I will refer to these scores as the residual implicit attitude scores for the remainder of this report. For each of these measures, higher scores indicate a more positive attitude towards Patricia.

I identified one outlier, at -179.50ms with a z-score of -5.33, amongst the implicit attitude difference scores. As the nearest z-score was -2.11, a larger distance away than found for previous outliers, I adjusted this score to be 3 standard deviations closer to the mean for a final score of -66.40. As with all adjustments to outliers in this report, I maintained rank order amongst all scores. I found two outliers amongst the residual implicit attitude scores. The first, which had a z-score of 3.54 and a mean of 118.25, I adjusted 0.5 standard deviations closer to the mean for a final score of 101.56. The second, which had a z-score of -3.53 and mean of -118.01, I also moved 0.5SD closer to the mean with a final score of -101.32. Neither of these scales were significantly skewed or kurtotic after adjustment to the outliers. The means and standard deviations for each of the final implicit attitude scales in each of the four conditions in the final sample are displayed in Table 8.
Table 8

Means and Standard Deviations for Implicit Attitude Scales by Condition

<table>
<thead>
<tr>
<th>Scale</th>
<th>WML</th>
<th>No-WML</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td></td>
<td>( n = 33 )</td>
<td>( n = 42 )</td>
<td>( n = 33 )</td>
<td>( n = 37 )</td>
</tr>
<tr>
<td>Implicit-D</td>
<td>15.03 (28.67)</td>
<td>21.58 (36.72)</td>
<td>28.65 (42.19)</td>
<td>23.97 (28.92)</td>
</tr>
<tr>
<td>Implicit-R</td>
<td>-5.21 (29.73)</td>
<td>-2.60 (30.74)</td>
<td>3.36 (41.35)</td>
<td>4.61 (28.46)</td>
</tr>
</tbody>
</table>

Note: \( N = 145 \). Implicit-D = implicit attitude difference score; Implicit-R = residual implicit attitude score.

Descriptive statistics and exploratory analyses. The means and standard deviations for forgiveness are provided in Table 9, and the correlations amongst the primary variables of interest are provided in Table 10. All measures of forgiveness and explicit attitude towards Patricia were highly correlated. However, the measures of implicit attitude correlated with the single-item forgiveness measure and behaviour alone (see Table 10). Therefore, I could not test the relative strength of the correlation between implicit attitude and affect, and implicit attitude and cognition. In the interest of adding to the discussion of the relative importance of affect and cognition in forgiveness, I compared the correlation between the single-item forgiveness measure and affect, and the correlation between the single-item forgiveness measure and cognition, following the procedure recommended by Meng, Rosenthal, and Rubin (1992). Affective attitude was significantly more strongly correlated with the single-item forgiveness measure than was cognitive attitude, \( z = 2.62, p = .004 \), one-tailed. However, the difference between the
respective correlations with the full TRIM was not significant, $z = 1.04, p = .149$, one-tailed.

Table 9

*Means and Standard Deviations for Forgiveness Scales by Condition*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Condition</th>
<th>WML</th>
<th>No-WML</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$n = 33$</td>
<td>$n = 42$</td>
</tr>
<tr>
<td>TRIM01</td>
<td></td>
<td>3.03 (0.88)</td>
<td>3.07 (1.07)</td>
</tr>
<tr>
<td>TRIM</td>
<td></td>
<td>3.98 (0.43)</td>
<td>3.98 (0.63)</td>
</tr>
<tr>
<td>Avoidance</td>
<td></td>
<td>3.76 (0.50)</td>
<td>3.76 (0.68)</td>
</tr>
<tr>
<td>Revenge</td>
<td></td>
<td>4.52 (0.45)</td>
<td>4.46 (0.62)</td>
</tr>
</tbody>
</table>

*Note: N = 149. TRIM01 = Single-item measure of self-defined forgiveness, taken from the TRIM; TRIM = Transgression-Related Interpersonal Motivations Inventory; Avoidance = Avoidance subscale of the TRIM; Revenge = Revenge subscale of the TRIM.  
*a For Transformed scales, the mean of the transformed scores were taken and then converted back into the original units of the scale. SDs are of original scores.*
### Table 10

**Intercorrelations Amongst Main Variables**

<table>
<thead>
<tr>
<th>Measure</th>
<th>M (SD)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. TRIM01</td>
<td>2.97 (0.93)</td>
<td>.53***</td>
<td>.35***</td>
<td>.55***</td>
<td>.42***</td>
<td>.38***</td>
<td>.47***</td>
<td>.47***</td>
<td>.18*</td>
<td>.05</td>
<td>.10</td>
<td>.16*</td>
<td>.18*</td>
</tr>
<tr>
<td>2. TRIM</td>
<td>1.56 (0.17)</td>
<td>-</td>
<td>.80***</td>
<td>.97***</td>
<td>.56***</td>
<td>.47***</td>
<td>.53***</td>
<td>.57***</td>
<td>.18*</td>
<td>-.09</td>
<td>.14*</td>
<td>.09</td>
<td>.07</td>
</tr>
<tr>
<td>3. Revenge</td>
<td>1.73 (0.20)</td>
<td>-</td>
<td>.63***</td>
<td>.43***</td>
<td>.36***</td>
<td>.35**</td>
<td>.38***</td>
<td>.10</td>
<td>-.05</td>
<td>.20**</td>
<td>.13</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>4. Avoidance</td>
<td>3.71 (0.53)</td>
<td>-</td>
<td>.55***</td>
<td>.47***</td>
<td>.54***</td>
<td>.59***</td>
<td>.17*</td>
<td>-.08</td>
<td>.09</td>
<td>.06</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. General</td>
<td>.16 (.39)</td>
<td>-</td>
<td>.71***</td>
<td>.67***</td>
<td>.66***</td>
<td>.29***</td>
<td>-.06</td>
<td>.16*</td>
<td>.03</td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cognitive</td>
<td>.06 (.30)</td>
<td>-</td>
<td>.67***</td>
<td>.56***</td>
<td>.21**</td>
<td>-.03</td>
<td>.11</td>
<td>.13</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Affective</td>
<td>-.08 (.33)</td>
<td>-</td>
<td>.62***</td>
<td>.23**</td>
<td>-.08</td>
<td>.06</td>
<td>.13</td>
<td>.07</td>
<td>.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Behaviour</td>
<td>.27 (.37)</td>
<td>-</td>
<td>.27***</td>
<td>-.03</td>
<td>.13</td>
<td>.05</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. BMIS</td>
<td>2.74 (0.44)</td>
<td>-</td>
<td>-.13</td>
<td>.03</td>
<td>.05</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Conditioning</td>
<td>-</td>
<td>-.03</td>
<td>.01</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. WML</td>
<td>-</td>
<td>-</td>
<td>.03</td>
<td>.11</td>
<td>-.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Implicit-D</td>
<td>22.31 (34.55)</td>
<td>-</td>
<td>-</td>
<td>.89***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Implicit-R</td>
<td>0.00 (32.62)</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** N = 145. As four participants were removed from the analysis of RT scores, the correlations displayed here are based on four less degree of freedom than the main analysis. TRIM01 = Single-item measure of self-defined forgiveness, taken from the TRIM; TRIM = Transgression-Related Interpersonal Motivations Inventory; Revenge = Revenge subscale of the TRIM (higher scores indicate greater forgiveness); Avoidance = Avoidance subscale of the TRIM (higher scores indicate greater forgiveness); General = general attitude towards Patricia; Cognitive = cognitive attitude towards Patricia; Affective = affective attitude towards Patricia; Behaviour = behavioural attitude towards Patricia; BMIS = Brief Mood Introspection Scale; Conditioning = positive or negative affective conditioning condition (1 = positive, 0 = negative); WML = working memory load condition (0 = no-WML, 1 = WML); Implicit-D = implicit attitude difference score; Implicit-R = residual implicit attitude score.

*p<.05. **p<.01. ***p<.001
In the interest of further exploring the relative importance of cognition, affect, behaviour, and implicit attitude in forgiveness, I used two simultaneous multiple regressions to determine if cognitive attitude, affective attitude, general attitude, behavioural attitude and implicit attitude could each uniquely predict forgiveness. In the first, I regressed the single-item forgiveness scale on each of the four explicit attitude scales and the residual implicit attitude scores, and in the second, I regressed the entire TRIM on the same measures. As can be seen from Table 11, affective attitude and behaviour alone accounted for unique variance in the single-item forgiveness scores, and general attitude and behaviour alone accounted for unique variance in the full TRIM.  

Table 11

**Standardized Regression Coefficients for Attitude Variables Predicting Forgiveness Across Two Measures.**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>TRIM01 β</th>
<th>TRIM β</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>.09</td>
<td>.22*</td>
<td>2.70</td>
</tr>
<tr>
<td>Cognitive</td>
<td>.01</td>
<td>.03</td>
<td>2.38</td>
</tr>
<tr>
<td>Affective</td>
<td>.25*</td>
<td>.17</td>
<td>2.29</td>
</tr>
<tr>
<td>Behaviour</td>
<td>.23*</td>
<td>.31***</td>
<td>2.01</td>
</tr>
<tr>
<td>Implicit-R</td>
<td>.10</td>
<td>-.01</td>
<td>1.05</td>
</tr>
</tbody>
</table>

*Note. N = 145. TRIM01 = Single-item measure of self-defined forgiveness, taken from the TRIM; TRIM = Transgression-Related Interpersonal Motivations Inventory; General = general attitude towards Patricia; Cognitive = cognitive attitude towards Patricia; Affective = affective attitude towards Patricia; Behaviour = behavioural attitude towards Patricia; Implicit-R = residual implicit attitude score.  

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

8 When these analyses are performed without the general attitude scale the same pattern of significance is observed with one exception; when the full TRIM is used as the dependent variable the affective attitude scale accounts for significant variance in forgiveness, $\beta = .22$, $p = .027$. 


Main analyses. I performed four hierarchical regressions to test the hypotheses that affective condition would predict forgiveness, and that WML would moderate this relationship between affective condition and forgiveness. Performing four separate regressions allowed for the use of four different measures of forgiveness as the dependent variable. The single-item forgiveness scale, taken from the TRIM, acts as a measure of self-defined forgiveness, our main variable of interest; however, to allow for comparison to the broader literature on forgiveness, I used the full TRIM and its revenge and avoidance subscales in the subsequent three regressions. In each regression, I entered eight control variables (importance of religion, tendency to forgive, education, sex, age, attitude towards forgiveness, attitude towards the situation, and experience with the name Patricia) at the first step, the two manipulated variables, affective condition and WML condition, at the second step, and the interaction between WML and affective condition at the third and final step. As can be seen from Table 12, my hypotheses regarding the conditioned affect and WML conditions, and the interaction between these conditions, were not supported. Further, against expectations, WML condition accounted for a significant proportion of variance in the revenge subscale of the TRIM.
Table 12

Hierarchical Multiple Regression Analyses Predicting Forgiveness on Four Scales From WML and Affective Condition.

<table>
<thead>
<tr>
<th>Step and variable</th>
<th>TRIM01</th>
<th>TRIM</th>
<th>Avoidance</th>
<th>Revenge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion Importance</td>
<td>.082</td>
<td>-.059</td>
<td>-.064</td>
<td>-.031</td>
</tr>
<tr>
<td>Tendency to Forgive</td>
<td>.214*</td>
<td>.281***</td>
<td>.280***</td>
<td>.260**</td>
</tr>
<tr>
<td>Education</td>
<td>.011</td>
<td>-.064</td>
<td>-.018</td>
<td>-.148</td>
</tr>
<tr>
<td>Sex</td>
<td>.169*</td>
<td>.109</td>
<td>.112</td>
<td>.044</td>
</tr>
<tr>
<td>Age</td>
<td>-.057</td>
<td>-.008</td>
<td>-.077</td>
<td>.153</td>
</tr>
<tr>
<td>Forgiveness Attitude</td>
<td>.144</td>
<td>.122</td>
<td>.115</td>
<td>.047</td>
</tr>
<tr>
<td>Situation Attitude</td>
<td>.130</td>
<td>.011</td>
<td>.031</td>
<td>-.014</td>
</tr>
<tr>
<td>Name</td>
<td>.029</td>
<td>.048</td>
<td>.065</td>
<td>-.019</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion Importance</td>
<td>.082</td>
<td>-.058</td>
<td>-.064</td>
<td>-.029</td>
</tr>
<tr>
<td>Tendency to Forgive</td>
<td>.215*</td>
<td>.273***</td>
<td>.275***</td>
<td>.253**</td>
</tr>
<tr>
<td>Education</td>
<td>.004</td>
<td>-.057</td>
<td>-.011</td>
<td>-.149</td>
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<tr>
<td>Sex</td>
<td>.171*</td>
<td>.106</td>
<td>.109</td>
<td>.043</td>
</tr>
<tr>
<td>Age</td>
<td>-.047</td>
<td>-.018</td>
<td>-.087</td>
<td>.153</td>
</tr>
<tr>
<td>Forgiveness Attitude</td>
<td>.132</td>
<td>.104</td>
<td>.107</td>
<td>.012</td>
</tr>
<tr>
<td>Situation Attitude</td>
<td>.124</td>
<td>.023</td>
<td>.042</td>
<td>-.005</td>
</tr>
<tr>
<td>Name</td>
<td>.029</td>
<td>.033</td>
<td>.056</td>
<td>-.037</td>
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<tr>
<td>WML Condition</td>
<td>.055</td>
<td>.107</td>
<td>.050</td>
<td>.190*</td>
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<tr>
<td>Affective Condition</td>
<td>.044</td>
<td>-.044</td>
<td>-.046</td>
<td>-.002</td>
</tr>
</tbody>
</table>

Continued on next page.
Table 12

Continued from previous page

<table>
<thead>
<tr>
<th>Step and variable</th>
<th>TRIM01</th>
<th>TRIM</th>
<th>Avoidance</th>
<th>Revenge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$\beta$</td>
<td>$\beta$</td>
<td>$\beta$</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Religion Importance</td>
<td>.072</td>
<td>-.053</td>
<td>-.059</td>
<td>-.019</td>
</tr>
<tr>
<td>Tendency to Forgive</td>
<td>.211*</td>
<td>.276***</td>
<td>.276***</td>
<td>.257**</td>
</tr>
<tr>
<td>Education</td>
<td>.006</td>
<td>-.059</td>
<td>-.012</td>
<td>-.152</td>
</tr>
<tr>
<td>Sex</td>
<td>.188*</td>
<td>.096</td>
<td>.101</td>
<td>.025</td>
</tr>
<tr>
<td>Age</td>
<td>-.054</td>
<td>-.014</td>
<td>-.083</td>
<td>.160</td>
</tr>
<tr>
<td>Forgiveness Attitude</td>
<td>.133</td>
<td>.103</td>
<td>.106</td>
<td>.010</td>
</tr>
<tr>
<td>Situation Attitude</td>
<td>.123</td>
<td>.024</td>
<td>.042</td>
<td>-.004</td>
</tr>
<tr>
<td>Name</td>
<td>.031</td>
<td>.032</td>
<td>.055</td>
<td>-.039</td>
</tr>
<tr>
<td>WML Condition</td>
<td>.132</td>
<td>.063</td>
<td>.015</td>
<td>.109</td>
</tr>
<tr>
<td>Affective Condition</td>
<td>.129</td>
<td>-.092</td>
<td>-.085</td>
<td>-.092</td>
</tr>
<tr>
<td>WML X Affective condition</td>
<td>-.140</td>
<td>.080</td>
<td>.065</td>
<td>.149</td>
</tr>
</tbody>
</table>

*Note: N= 149.*

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

**Additional analyses.** I performed several additional analyses examining potential alternative effects of our manipulations, as well as participants' actual experiences with forgiveness.

It is possible that only those who actually consistently rehearsed the numbers they were asked to memorize would have divided their attention across tasks and therefore were more likely to use automatic processing. Further, those who rehearsed the numbers throughout the entire study, despite being placed in the no-WML condition, may have
also divided their attention to complete this task, and therefore may also have been more likely to use automatic processing. Therefore, different, more pertinent results might be attained if reported rehearsal rather than assigned condition were used to determine WML. To test this hypothesis, I repeated the regression used in the main analysis, using the single-item forgiveness scale as the dependent variable, but replaced WML with reported rehearsal rate.\(^9\) Neither affective condition, \(t(179) = 1.06, p = .290\), nor reported rehearsal rate, \(t(179) = -0.057, p = .955\), accounted for significant variance in forgiveness. Further, there was no significant interaction between affective condition and reported rehearsal rate, \(t(178) = 0.99, p = .325\).\(^{10}\)

Another potential variable that could moderate the effectiveness of the conditioning stage of the study was the extent to which participants were aware of and attended to the affective stimuli. Although all participants were informed that they may see images flashed on the screen, supposedly in an attempt to distract them, and were instructed to try their best to ignore these images, 36 reported that they were not in the

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\(^9\) The df is larger for this analysis as compared to the main analyses because those who had rehearsed reported that they rehearsed the numbers constantly or almost constantly in the No-WML condition, and those who reported that they did not rehearse in the WML condition were included in this analysis but not the main analyses.

\(^{10}\) I performed a similar analysis to determine if recall accuracy might moderate the effects of WML condition on forgiveness. To test this, I performed a hierarchical regression using the single-item forgiveness scale scores as the dependent variable. I entered the centered continuous recall accuracy scores, WML condition, and affective condition at the first step of the regression. I entered the three two-way interaction terms at the second step of the regression, and the three-way interaction term at the third step of the regression. Only the three-way interaction term was significant, \(t(182) = -2.31, p = .022\). I tested the simple slopes for affective condition at one standard deviation above and at one standard deviation below the mean recall accuracy score for each WML condition. Within the WML condition, the simple slope for affective condition was significant at one standard deviation above the mean recall accuracy, \(t(92) = -7.35, p < .001\), but was not significant at one standard deviation below the mean recall accuracy score, \(t(92) = 1.477, p = .071\). At one standard deviation above mean recall accuracy, the predicted values for forgiveness in the negative and positive affective conditions were 3.29 and 2.83 respectively. In the no-WML condition, there was also a significant simple slope for affective condition at one standard deviation above the mean recall accuracy score, \(t(92) = 1.82, p = .036\), but not at one standard deviation below the mean recall accuracy score, \(t(92) = 0.07, p = .527\). At one standard deviation above the mean recall accuracy score, the predicted forgiveness scores for the negative and positive affective conditions were 2.69 and 1.82 respectively.
"distractor condition" (suggesting they were unaware of the affective stimuli), 26 reported that they were unable to ignore these images, and the remaining 87 were aware of these images but reportedly ignored them. I performed a 2 X 2 X 3 ANOVA with WML, affective condition, and reported attention to the affective stimuli as the respective independent variables, and scores on the single-item forgiveness measure as the dependent variable. I found no significant main effect or interaction. For affective condition $F(1, 137) = 0.06, p = .805$, for WML $F(1, 137) = 3.37, p = .069$, for attention $F(2, 137) = 1.90, p = .154$, and for the interaction $F(2, 137) = 0.30, p = .740$.

In addition to allowing a mediational analysis, I collected the implicit attitude measures to allow for a second manipulation check for the effectiveness of the affective conditioning phase of the study. It is possible that this conditioning could create associations with the transgressor that result in positive or negative implicit attitudes towards the transgressor without in turn affecting explicit attitudes towards the transgressor. To test this, I performed two 2X2 factorial ANOVAs with affective condition and WML as the independent variables, and each implicit measure as the dependent variable. I found no main effects or interactions for either the implicit attitude difference scores or the residual implicit attitude scores. For the difference score, the main effect for affective condition was $F(1, 141) = 0.025, p = .871$, the main effect for WML was $F(1, 141) = 1.924, p = .168$, and the interaction was $F(1, 141) = 0.947, p = .332$. For the residual score, the main effect for affective condition was $F(1, 141) = 0.125, p = .724$, the main effect for WML was $F(1, 141) = 2.090, p = .150$, and the interaction was $F(1, 141) = 0.015, p = .902$."

In the absence of an effective conditioning procedure, it is likely that participants would nonetheless have an implicit attitude towards Patricia, based on experiences with similar persons or situations, and on associations with her physical characteristics. The impact of this attitude on forgiveness may have been moderated by WML. To test this hypothesis, I performed a regression using the single-item forgiveness scale as the dependent variable. I entered WML condition and the residual implicit attitude scores at the first step of this regression and the interaction between WML condition and the residual implicit attitude scores at the second step. Implicit attitude accounted for a significant proportion of variance in forgiveness, $t(142) = 2.32, p = .022$, and WML did not $t(142) = 1.21, p = .145$. However, the interaction term did not account for a significant proportion of variance in forgiveness, $t(141) = 0.09, p = .843$.

It has been suggested that in the study that the conditioning stage of the current study was based upon (Krosnick et al., 1992), the manipulation did not directly impact attitude toward the target, but instead affected attitude toward the target by altering the participants' moods (Lovibond & Shanks, 2002). Although I found no main effect for forgiveness or attitude, it is possible that mood may have been affected, but not with enough strength to in turn affect attitude or forgiveness. To test this possibility. I performed a 2 X 2 factorial ANOVA with affective condition and WML as the independent variables, and scores on the BMIS (mood scale) as the dependent variable. No significant main effect or interaction was found. For affective condition $F(1, 145) = 2.20, p = .140$, for WML $F(1, 145) = .48, p = .49$, and for the interaction $F(1, 145) = .64, p = .423$. 
Participants were asked about their actual experiences with forgiveness and internal conflict. When asked “After you believe you have forgiven a person, have you ever found that you still feel angry or upset from time to time?” 131 (87.92%) responded “yes.” These participants were asked to provide several details about this experience in an open-response format. Due to this format, only a fraction of these participants directly answered each of these follow-up questions. Out of the 58 who provided a clear response to the first probe, 39 (67.24%) reported that they found the experience of internal conflict surprising or troubling. Out of the 91 who provided a clear response to the second probe, 67 (73.63%) reported that the internal conflict made them doubt whether or not they had actually forgiven. Out of the 93 who provided a clear response to the third probe, 59 (63.44%) reported that it was common for them to have mixed thoughts and feelings when forgiving.\footnote{Whenever possible, the participant’s definition of "common" was used. When participants responded to this probe by reporting the number of times they had had this experience, 3 or more was coded as common. When participants responded by reporting the proportion of experiences with forgiveness that involved mixed thoughts and feelings, 25% or more was coded as common. If a participant responded that this experience was common for people in general, it was assumed that this response applied to the participant as well and was therefore coded as common.}

Similarly, when asked “have you ever believed that you had NOT forgiven a person but found you still feel love or affection for that person from time to time?” 114 (76.51%) responded “yes.” Again, participants were asked to answer several follow-up questions about this experience in an open-response format. Out of the 64 who directly answered the first follow-up question, 37 (57.81%) reported that they found this experience of internal conflict surprising or troubling. Out of the 59 who directly answered the second follow-up question, 32 (54.24%) indicated that the experience of internal conflict made them doubt that they had not forgiven. Finally, 39 (58.21%) out of
the 67 who provided a clear answer to the last follow-up question indicated that it was common for them to experience mixed thoughts and feelings when forgiving.\textsuperscript{12}

When asked "When you forgive, do you ALWAYS feel that every part of you has forgiven?" 15 (10.07\%) responded "yes, certainly," 85 (59.44\%) responded "I am not sure," and 49 (32.89\%) responded "no." When asked "once you have made a decision as to whether or not you forgive, do you find that all your thoughts and feelings agree?" 32 (21.48\%) responded "yes, certainly," 59 (39.60\%) responded "I am not sure" and 58 (38.93\%) responded "no."

\textsuperscript{12} See footnote 6.
In the Introduction I laid out the argument that forgiveness can be better understood through the application of dual-process theory. Specifically, forgiveness may be composed of any number of interrelated processes each of which may occur independently or co-occur. Further, scholars and laypersons may regard different subsets of these processes as the core of forgiveness. Thus, as has been observed in the literature, the definitions of individual laypersons and scholars often conflict (DeCourville, Belicki, & Green, 2008; Enright, Eastin, Golden, Sarinopoulos & Freedman, 1992; Kanz, 2000; McCullough, Pargament, & Thoresen, 2000; Mullet, Girard, & Bakhshi, 2004; Rye et al., 2001; Stewart, DeCourville, & Belicki, 2010; Younger, Piferi, Jobe, & Lawler, 2004; Zechmeister & Romero, 2002).

Further, the descriptions of forgiveness provided by scholars imply that each of the processes involved in forgiveness, such as changes in affect, cognition or behaviour, are likely to co-occur, whereas lay experiences with forgiveness tend to be more fragmented, or to involve more internal conflict. Laypersons frequently report experiencing some thoughts and/or feelings that are associated with forgiveness concurrently with others that are associated with unforgiveness (DeCourville et al. 2008; Kanz, 2000; Mullet et al. 2004; Stewart, et al., 2010; Zechmeister & Romero, 2002). I would argue that this conflict is often the result of processes originating from separate systems posited by dual-process theory (e.g., Stanovich, 2004). Some thoughts and feelings may be produced by the automatic, effortless, and largely unconscious processing of System 1 and its associative network, and others may be produced by the conscious, effortful, and rule-based processing of System 2. Such different forms of
processing are likely (as compared to multiple processes within the same system) to reach different conclusions in the form of thoughts, feelings, and behaviours. Thus, by taking a dual-process perspective we can better understand internal conflict regarding forgiveness, and the conflict that currently exists amongst the many definitions of forgiveness provided by scholars and laypersons.

The study described here was designed to determine if both System 1 and System 2 processing can play a role in forgiveness. Specifically, I tested the hypothesis that System 1 processing can directly impact one's likelihood to forgive and that System 2 processing can moderate this relationship. To test this hypothesis, I attempted to create conditioned attitudes towards a hypothetical transgressor using subliminal stimuli. For half of the participants this conditioning was designed to create a positive affective association with the transgressor, and for half a negative affective association. Because System 1, but not System 2 processing, is sensitive to subliminal stimuli, any effect of conditioning on forgiveness could be attributed to System 1 processing. Furthermore, even if supraliminal stimuli were used to create the conditioned attitudes, any effects of this conditioning could be attributed to System 1 because no form of conditioning would provide any rational or rule based reasons to forgive or not forgive, and, therefore, any form of conditioning should have no effect on System 2 processing.

In addition to the manipulation of conditioned attitudes, WML (working memory load) was induced and maintained by half of the participants when forgiveness and attitude towards the transgressor was measured. Because System 2 processing requires working memory but System 1 processing does not, any effect of WML could be attributed to System 2 processing. I predicted no direct effect of WML; however, I
hypothesized that System 2 processing would moderate the effects of the conditioning phase of the study such that it would have a weaker or non-existent effect amongst those in the no-WML condition.

Unfortunately, because the manipulation checks indicated that the conditioning phase of the study was ineffective, no conclusion can be made with regard to the role of Systems 1 and System 2 processing in forgiveness. I included these manipulation checks in the study to make my hypotheses falsifiable. If I had found a significant difference for explicit and implicit attitude between affective conditions, with a large effect size, but forgiveness remained unaffected, this would have provided strong evidence that individuals do not use system 1 processing when considering forgiving. It would have shown that individuals are able to ignore associations with a transgressor in the absence of a clear reason for that association. However, without an effective conditioning phase, there is no reason to believe that System 1 processing would have created the hypothesized differences in forgiveness scores. Therefore, the question of whether or not System 1 directly affects forgiveness remains unanswered. Furthermore, given that a relationship between System 1 processing and forgiveness could not be established, it could not be determined if System 2 processing moderates this relationship.

Methodological Issues in Subliminal Conditioning

There are a few reasons why the conditioning phase might have failed to replicate the findings of Krosnick et al. (1992) and proved ineffective at creating a difference in attitude by condition. The first is that the affective stimuli were displayed for a longer interval in my study, approximately 30ms in my study, as compared to 17ms and 13ms in two studies reported in Krosnick et al. These authors found a larger effect size when
exposing the affective stimuli for a longer time, with a Cohen's d of .93 when the stimuli were exposed for 13ms, compared to a Cohen's d of .29 when the stimuli were exposed for 9ms (however, this difference falls just short of significance, \( z = 1.58, p = .057 \)).

However, it is possible that having some conscious perception of the affective stimuli (as discussed below) negated their effects. In Krosnick et al.'s study, none of the participants reported suspecting that pictures of anything other than the target person had been exposed. However, in my study nearly 60% of those in my sample were able to accurately describe an aspect of one or more of the affective stimuli. In Krosnick et al.'s study, any positive or negative affect that resulted from the affective stimuli might have been attributed to the target person. In my study, because the participants were aware that other images were being shown, they may have accurately attributed such affect to these photos and thereby avoided forming a positive or negative association with the hypothetical transgressor.

A second difference between the conditioning phase of my study and the conditioning used in Krosnick et al. (1992) was that I used different stimuli. The stimuli used in Krosnick's study appeared dated when presented to colleagues (see Figure 2 for an example). I was concerned that these older images would not have the same effect on my participants as they did on Krosnick et al.'s participants prior to 1992. The stimuli used in my study were taken from the IAPS, which is specifically designed to provide standardized emotionally evocative stimuli. Across the 18 original studies referred to in Lang et al.'s (2008) technical manual for the IAPS each image was rated by approximately 100 participants. On a scale of 1 to 9, in which 9 indicates a positive valence and 1 indicates a negative valence, the stimuli selected for the positive affective
condition in my study had a mean valence rating of 7.18, and the stimuli selected for the negative affective condition had a mean pleasantness rating of 2.30. Similar ratings were obtained in at least two other studies (Ito, Cacioppo, & Lang, 1998; Libkuman et al., 2007). Krosnick et al.'s stimuli had been selected based on pleasantness ratings from a single pre-test. It is therefore likely that the images used in my study were as effective, or more effective, at reliably evoking the desired affective response when perceived consciously.

Figure 2. Sample positive affective stimulus from Krosnick et al. (1992).

However, it is possible that other aspects of the images affected the effectiveness of the emotional content when perceived at a subliminal or nearly subliminal level. For example, it is possible that simple images would be more effective at provoking emotional reactions when they are displayed for under 50ms. This might be the case if the unconscious is only (or more) capable of taking in simple stimuli, as is suggested by Baars (2002). Although I attempted to take complexity into account when I selected
images for my study, some might be judged by others as more complex than those used in Krosnick et al. (1992; for example, compare Figure 3 to Figure 4).

Figure 3. Sample negative affective stimulus from Krosnick et al., 1992.

Figure 4. Sample affective stimulus from the current study.
A third possible reason why the conditioning phase in my study was not effective, as it was in Krosnick et al.'s (1992) study, is that the participants in my study might not have attended to the images displayed (either the affective stimuli, or the images of the target person/offender) in the same way. There is already some evidence that participants in my study could not understand or did not comply with instructions as intended; more than 22% of participants in the WML condition (though deleted from the final sample) made no apparent attempt to maintain the numbers in memory, and the majority of participants in the no-WML condition continued to rehearse the numbers after the temporary WML task was complete. It is possible that participants in my study did not comprehend or choose to follow the instructions to keep their eyes on the center of the screen in between slides. It is further possible that participants in my study, either because they had different motivations for participating in the study, or, for whatever reason, were more fatigued, were more likely to lose focus during the conditioning phase of my study than were the participants in Krosnick et al.'s study.

Perception of “Subliminal” Stimuli

Based on both participants’ subjective accounts of the stimuli and the results of the forced choice identification task, it can be concluded that at least some of the affective stimuli were consciously perceived by many of the participants in the study. Recall that using subliminal stimuli simplified my argument that the effects of the conditioning phase would have to operate through System 1 processing; however, using subliminal stimuli was not necessary to make this argument. As previously noted, this is because there is no line of rational or otherwise systematic reasoning that would lead individuals to be more or less forgiving of a transgressor because they viewed
photographs of that transgressor shortly after viewing photographs of pleasant or unpleasant stimuli. However, in order to increase our understanding of methodological issues in subliminal conditioning it is interesting to discuss the extent to which the affective stimuli in my study were consciously perceived.

According to my more liberal measure (which specifically prompted participants to describe any images seen before the images of Patricia), over half of the participants could accurately identify some feature of at least one of the affective stimuli. I say “some feature” because often the participants did not fully describe the photograph as a whole. For example, some of the participants reported that they saw teeth and I regarded this as an accurate description of a photo. However, it was not just teeth that were shown, but an image of a dog baring its teeth. It is likely that the participants simply reported “teeth” because they could not tell if it was an image of a dog or another animal. In support of this claim, two participants included a tiger in their descriptions of the photos, and one participant indicated that they saw “teeth of an animal.”

It is further likely that only some of the affective stimuli were ever perceived consciously. In participants’ subjective reports it was usually the same four or five images (2 per condition; an image of a boy crying, an image of a dog baring its teeth, a picture of a baby, two pictures of couples embracing\textsuperscript{13}) that were identified. Most participants only mentioned the content of one of the images. No participant described any feature of at least 10 of the 20 images (some of the references could apply to more than one of the stimuli), suggesting that these images were not consciously perceived.

\textsuperscript{13} It cannot be determined if participants were seeing both images of couples embracing, or just one of them.
Indeed, although many participants indicated that they had seen the affective stimuli during the “slideshow” (conditioning phase of the study), many participants insisted during debriefing that they could see nothing during the forced choice identification task and were guessing randomly. This suggests that there was something about some of the photographs used as affective stimuli that made them more visible as compared to the stimuli in the forced choice identification task when displayed for the same amount of time. Similarly, participants were able to correctly identify the photograph of the snake during the forced choice identification task significantly more frequently than they were able to correctly identify the photograph of the kitten, suggesting that there is something about the photograph of the snake that makes it more visible than the photograph of the kitten. If some photographs are more visible than others when displayed for the same amount of time, it seems reasonable to conclude that participants would have been able to consciously perceive some of the affective stimuli but not others.

By my own appraisal, when displayed for 34ms or less, the photograph of the kitten has no identifiable features; however, the photograph of the snake can be identified by a flash of green originating from the background of grass. One participant reported during debriefing that he too identified the image of the snake by looking for the colour green. It is likely that other participants in my study were able to identify photographs by this or other low level features. This suggestion is further supported by the fact that participants performed the forced choice identification task with higher accuracy after being allowed to look at the photographs for as long as they wished as compared to the first set of trials. Having viewed the photographs for as long as they desired, participants
would have been able to use this time to identify which low level features belonged to
which photograph, and to use these features to identify the two photographs in
subsequent trials. However, it should be noted that this effect cannot be distinguished
from the confound of practice because the trials after participants had been shown the
photographs supraliminally necessarily had to occur after the trials that occurred before
the participants had been shown the photographs supraliminally.

It should be noted that the ability to discriminate between images during a forced
choice identification task does not mean that participants were subjectively aware of the
stimuli. In fact, it was the very goal of the conditioning phase of my study to use the
stimuli to affect the participants’ behaviour without their knowledge. Indeed, there is a
large body of research on the effects of subliminal stimuli on behaviour, including such
discrimination tasks (e.g., Marcel, 1983). However, it is interesting to note that studies
such as Krosnick et al.’s (1992) second study suggest that one can use subliminal stimuli
to create a disposition towards one behaviour (rating the target person as more or less
good) without affecting another (correctly guessing which of two stimuli were
displayed)\textsuperscript{14}. This may indicate that there is a lower threshold for creating System 1
processes that create associations or directly affect behaviour than there is for creating
System 1 processes that inform System 2 processes, here, by creating an unexplainable
suspicion that one had seen a stimulus before. Another possible way of distinguishing
between the two effects is that the target ratings resulting from the association formed

\textsuperscript{14} In Krosnick et al.’s (1992) study 2, as in our study, a forced choice identification task was performed
separately from the conditioning phase of the study. Although subliminal stimuli in the conditioning phase
of this study affected participants’ ratings of the target person, participants were not able to discriminate
with greater than chance accuracy between a colour photograph, and black text displayed on a white
background when exposed for the same amount of time. This suggests that in a single task participants
could be affected by a stimulus but be unable to guess which stimulus it was with above chance accuracy.
were potentially more emotional (e.g., participants may have “felt” they liked the person, and “felt” the person was good - the two ratings that formed the attitude scale) and the choice between the two possible stimuli was more cognitive. This could imply that there is a lower threshold for creating emotional System 1 processes than cognitive System 1 processes.

There are a few reasons why I used a 30ms (±4) exposure time for the affective stimuli in the conditioning phase of the study. Hardware and software limitations made this exposure time the shortest possible. This exposure time is below the common 55ms maximum exposure time rule of thumb used for subliminal primes (e.g., Epley n.d.), and, as previously discussed, some awareness of the stimuli would not invalidate the argument that the effects of these stimuli would have to operate through System 1 processes. Further, based on the trend towards larger effect sizes with longer exposures of subliminal stimuli in Krosnick et al.’s (1992) study, I had hoped that the increased exposure time would make the conditioning more effective.

Moreover, a barely perceivable affective stimulus, as compared to a completely subliminal one, would more closely resemble the sorts of stimuli that individuals interact with and form associations with in the every day. For example, an individual might come to associate an acquaintance with an unfortunate life event, such as a death or loss of work, that occurred at the time at which the acquaintance was met. That individual would not be unaware of the death or loss of work, but would be unaware that an association between this event and the acquaintance had been formed. However, in the artificial environment of the psychology researcher’s laboratory, knowledge of the existence of an affective stimulus could have a different effect than the knowledge of a natural affective
stimulus in real life. Participants in a study are likely to be anticipating the intentions of the experimenter, as evidenced by the large number of participants in the no-WML condition in my study who decided to continue to maintain the numbers in their memory in case they were asked again (see below for discussion). Although only two participants admitted any suspicion that the affective stimuli were intended to affect forgiveness, participants likely attended to the affective stimuli in the study in a way that is dissimilar to the treatment of affective stimuli in real life.

**WML and participant compliance**

Answers to the working memory load maintenance questionnaire indicated that participants did not understand and/or follow the directions regarding WML as intended. Nearly a quarter of the participants in the WML did not rehearse the memorized numbers to maintain them in their working memory despite frequent reminders that they should not forget the numbers. This may have been because these participants believed they could remember the numbers without rehearsing; however, only 14 of the 75 participants in the WML condition in the final sample correctly recalled all of the numbers, and some participants indicated in their feedback that they felt I should have used fewer numbers. An alternative explanation is that these participants thought it would be too difficult to memorize 10 digits and so did not try. However, during the pretesting, only 8 digits were used and volunteers indicated that they felt the task was too easy for them to feel the need to rehearse, and that they would be more likely to rehearse if there were more digits.

Another potential explanation is that these participants did not genuinely wish to assist with the study and so they were attempting to complete it as quickly, and with as little effort, as possible. This possibility is supported by the finding that 15 participants
could not answer either of the two simple questions about the hypothetical transgression in my transgression comprehension questionnaire, and 63 were not able to answer the first. This suggests that participants were reading and following the instructions with some degree of carelessness.

Surprisingly, the majority (57 out of 99) of the participants in the no-WML condition rehearsed the numbers they had been asked to memorize even after they were asked to recall them. In fact, more participants reported that they had rehearsed the numbers constantly or almost constantly in the no-WML condition than in the WML condition. These findings may be partially attributed to an error in which participants in both WML conditions were instructed “After you have completed a few other activities within the study we will ask you to recall as many of these numbers as possible in the order that they were presented to you.” This instruction may have led some of the participants in the no-WML condition to be confused when they were asked to recall the numbers after only a 20 second delay.

It is also possible that many of the participants came to the study with the expectation that it would involve deception, as studies in psychology (including mine) commonly do. As such, participants may have continued to rehearse the numbers so that they could perform especially well in recalling the numbers if I decided to “trick” them by asking them to recall the numbers a second time later in the study without informing them beforehand that I would do so. These findings should serve as a reminder that experimental studies create situations in which individuals may behave artificially in response to the artificial environmental conditions and task demands. Further, researchers should be mindful of the effects of recruiting participants by offering monetary awards or
course credit as such participants may be less motivated to read and follow instructions carefully.

**The Effects of WML on Hypothetical Forgiveness**

It is most likely that the finding that WML condition accounted for significant variance in the revenge subscale of the TRIM, was merely an artifact of the study; however, one alternative explanation can be provided. Recall that System 2 processing is responsible for hypothetical thinking. It is possible that those in the WML condition were not fully able to imagine themselves in the position of having just lost a potential job due to their friend’s negligence. As such, they might have regarded the transgression as less severe than did participants in the no-WML condition. If the transgression was seen as less severe amongst participants in the WML condition, then these participants may have considered forgiveness a less difficult task than did those in the no-WML condition, and may have seen the transgressor as more deserving of forgiveness.

Moreover, those in the WML condition may have been more likely to rely on a forgiveness heuristic in which they based their likelihood to forgive on their attitude towards forgiveness itself. That is to say, those in the WML condition who considered forgiveness to be good might have reasoned, forgiveness is good, therefore I should forgive and vice versa, rather than taking into account all the effects of forgiveness and unforgiveness. This would have led participants in the WML condition to be more forgiving than those in the no-WML condition because the mean forgiveness attitude score in the final sample was 5.79, where 1 indicates that forgiveness is “Very Bad” and 7 indicates that forgiveness is “Very Good.” However, this explanation for this finding should be regarded with some skepticism because it was created post-hoc. Future
research should use a priori hypotheses to investigate the effects of WML on participants’ reactions to hypothetical events. One novel hypothesis that could be tested is that participants under WML would be less accurate in predicting their thoughts, feelings, or behaviours in hypothetical situations than participants not under WML. The accuracy of such predictions could then be determined based on previously established findings concerning how individuals react to certain types of situations.

Exploring the Components of Forgiveness

Although in my Introduction I have focused on incongruence between the components of forgiveness, it is not surprising that the affective, cognitive, general and behavioural components of attitudes examined here were strongly correlated. I have discussed how cognition and affect are differentially associated with System 1 and System 2. However, although the nature of the processes within each system differ, both systems work with many of the same stimuli, and work towards many of the same goals (Stanovich, 2004). System 1 is more closely associated with the goal of genetic proliferation, and System 2 is more closely associated with the goals of the individual; however, all of these ultimate goals require individuals to meet the more immediate goals of navigating their surroundings, avoiding injury, obtaining food and so on. Similarly, both cognition and affect are likely to be driven by many of the same stimuli and goals.

I have focused instead on incongruence between cognition and affect in my Introduction because such incongruence is more practically and theoretically interesting than when cognition and affect are congruent. For example, clients are more likely to struggle with deciding if they forgive a person if cognition and affect are incongruent, and therefore incongruence is of greater interest to a clinician. Further, competing
cognitive and affective inclinations more strongly suggest that there are multiple underlying systems than thoughts and feelings that agree. The correlations between the attitude scales were not perfect, indicating some degree of independence between them. More importantly, it is my contention that some individuals may experience incongruence between these processes, not that all individuals on average experience this incongruence. Here we would expect that an individual might score relatively high on one or more attitude scales, and relatively low on another, not that on average those who tend to score high on one attitude scale would not also tend to score high on the remaining attitude scales. This intra-individual incongruence is reflected in participants' accounts of their experiences with forgiveness.

Amongst the measures of explicit attitude, I found that affective attitude and behavioural attitude accounted for unique variance in self-defined forgiveness but that cognitive and general attitude towards the transgressor did not. Further, when examining forgiveness as defined by the full TRIM, general attitude and behaviour predicted a significant proportion of unique variance in forgiveness, but affective and cognitive attitude did not. There are a few alternative explanations for these findings. First, there is a moderate degree of multicollinearity amongst each of the explicit measures of attitude (however VIF values are within an acceptable range; see Table 11). As such, some caution is necessary when interpreting the corresponding betas as a measure of relative importance because with multicollinearity we might not expect to find the same betas in a different sample.

Further, the affective, cognitive, and general attitude measures were designed by Crites, Fabrigar, and Petty (1994) to be directly comparable. I attempted to create a
behaviour scale that would also be comparable, but it has not undergone the same analysis and reformulation as the other measures to ensure this. It may be the case that the behaviour scale accounted for unique variance in forgiveness due to properties of the scale other than the fact that it intended to measure behaviour. Moreover, it may be the case that behaviour is not a substantial predictor or component of forgiveness, but that participants felt obligated to indicate that they would behave amiably towards Patricia after having claimed that they forgave her.

Similarly, it is possible that cognitive or general attitude once accounted for unique variance in self-defined forgiveness, but that an awareness of this cognitive or general attitude towards Patricia prompted a change in affective and behavioural attitude such that these two variables would then come to account for the same variance in forgiveness. However, why the variance in affective attitude and predicted behaviour that accounted for unique variance in forgiveness would not then prompt a similar change in cognitive and general attitude is unknown. It may simply be the case cognitive and general attitude did not inform participants’ perceptions of whether or not they forgive beyond what could be accounted for by affective attitude and predicted behaviour. We would still, nonetheless, expect each of these variables to act as strong predictors of forgiveness on their own.

The same arguments described above could be applied when explaining why general and behavioural attitude accounted for unique variance in the full TRIM but cognitive and affective attitude did not. If we are instead to accept these findings as representative of the relative importance of each of these components in both self-defined forgiveness and forgiveness as defined by the TRIM, there is an important implication for
the continuing debate regarding the correct definition of forgiveness. This evidence suggests that forgiveness as defined by the layperson is uniquely affected by the individual’s affective reaction to the transgressor, whereas forgiveness as it is defined by the TRIM, and potentially by the many authors who use the TRIM as their operational definition of forgiveness, relies more heavily on a more general evaluation of the transgressor (which may itself covary with affective attitude). This suggestion is further supported by the finding that affective attitude was significantly more strongly correlated with forgiveness than was cognitive attitude when the single-item measure of forgiveness was used as the measure of forgiveness, however this difference was not significant when the full TRIM is used. These findings then support the argument that I outlined in the Introduction, that definitions of forgiveness may often differ based on which potential components are considered most integral.

It is also interesting to note that implicit attitude did not account for unique variance in forgiveness over and above what was accounted for by their explicit attitudes towards Patricia. In the absence of effective conditioning, implicit attitudes towards Patricia might have reflected associations formed by experiences with similar situations or people, or implicit reactions to the characteristics of the transgressor suggested by the slideshow or hypothetical transgression. The current findings suggest that these components of the participants’ attitudes did not affect forgiveness independent of participant’s explicit attitudes towards the transgressor. However, it is also possible that an awareness of their implicit attitudes towards the transgressor, via their gut reactions or automatic thoughts, helped to form the participants’ explicit attitudes. Without the unexplained presence of an implicit attitude created by subliminal conditioning, there is
no reason why an implicit attitude towards the transgressor would not become an explicit attitude towards the transgressor.

Participants' Past Experiences With Forgiveness

The data collected regarding participants' actual experiences with forgiveness supports the view of lay-forgiveness as fragmented that was developed from my review of lay experiences with forgiveness in the Introduction. In this view, individuals often experience internal conflict when forgiving, resulting from some of the processes that underlie forgiveness occurring in the absence of others. Whether or not this is due to incongruence between the two systems posited by dual-process theory, this multi-process perspective of forgiveness may help to explain the level of disagreement regarding the definition of forgiveness. Each scholar and lay-person may have selected a subset of several related processes as the core of what they consider forgiveness. Assigning multiple processes the same name may help foster the illusion that these processes are inseparable. Clients engaging in forgiveness in therapy may benefit from this more nuanced understanding of the construct. Making it explicit that they are attempting to engage in multiple independent processes may help quell frustration when these processes do not co-occur.

Limitations

Beyond the failed conditioning phase of the study, there are a few limitations that should be taken into account when examining the data presented here. First, the number of participants included in the analyses is inconsistent. Four participants, who did not respond to the GNAT as intended, were removed from any analysis involving implicit attitude scores, but were retained in the main analyses. Further, those participants that did
not rehearse the WML digits as expected were included in analyses examining potential moderators of the effects of WML conditions, or alternatives to examining assigned WML condition. This means that these analyses involved slightly different samples and therefore cannot be directly compared.

In interpreting my results one must also consider the possibility that participants’ responses to some measures may have been influenced by those completed prior. For example, participants who indicated that they had forgiven Patricia may have been more likely to rate themselves as more forgiving. I chose to have participants complete tasks in an order that would give priority to those measures that would be used to answer the questions most central to my thesis. This means that we can assume that the responses to the forgiveness scales were not affected by exposure to the remaining measures but the effect of the order of the measures is unknown.

A major limitation that must be considered when interpreting the analyses regarding potential components of forgiveness is that the study was designed for optimal internal validity rather than external validity. As such, participants were responding to a hypothetical transgression that may lead to less realistic forms of forgiveness. This choice was ideal for a first study examining the relevance of dual-process theory to forgiveness; however, it may be less appropriate when examining potential components of forgiveness. Future research may be used to determine if cognition, affect, behaviour, and implicit attitudes play different roles for individuals forgiving real transgressions, and if the importance of these potential components of forgiveness varies by situation.
Dual-Process Theory, “True Forgiveness,” and the “True Self”

As various models compete to define the core aspects of forgiveness, it is interesting to note the claims made concerning what we can accurately describe as forgiveness. In examining the literature one frequently encounters the term “true forgiveness” (e.g. Coleman & Byrd, 2003; Enright et al., 1991, 1998; Freedman, 2008), or alternatively “false” or “pseudo forgiveness”. Two different issues get conflated in this language. The first is the question of whether or not the phenomenon being referred to is a component of forgiveness. For example, does forgiveness include condonation or reconciliation, or are these differentiable from forgiveness? In this case the language of “true forgiveness”, although arguably not the best choice of words, conveys the author’s concern with sufficient accuracy.

However, at times “false forgiveness” (or similar terms like “pseudo forgiveness”) is used to refer to the existence of components of forgiveness either in the absence of phenomena that the author considers necessary for complete forgiveness, or accompanied by phenomena that the author sees as contradictory to forgiveness. This occurrence may better be described as incomplete or conflicted forgiveness. This may cause confusion; for example If a therapist were to assert that the forgiveness expressed by a client is not true forgiveness, a client may interpret this to mean that the changes, or processes, that occurred were false, rather than that other essential (by Enright’s definition) changes, or processes, had not occurred. This distinction can only be made clear explicitly positing that forgiveness consists of multiple parallel processes.

This is particularly troublesome in the case that the phenomena that are considered contradictory to forgiveness exist either outside the client’s awareness or
beyond the client’s control. In such a case the client may perceive the therapist as asking something of them that is beyond their understanding or control. Both therapist and client may be missing the vital point that one part of the individual has validly and truly “forgiven” (by an acceptable definition of forgiveness, whatever that might be), whereas other part(s) of the individual has not. Until the role of the unconscious is made explicit, we cannot confront any problems that may reside there.

One important consideration is that System 1 and System 2 processes may also be thought to differentially represent the “true self”. For some the true self is best represented by what individuals “feel in their hearts” and for others the true self is best represented by their conscious thoughts and intentions. Indeed, there is currently an ongoing debate with regard to whether or not some (or all) implicit associations should be considered a reflection of the true self (as personal associations), or merely an impersonal reflection of the cultural norms within which an individual is situated (as extra-personal associations; Arkes & Tetlock, 2004; Gawronski, Peters, & LeBel, 2008). Gawronski et al. (2008) have argued that there may be no objective distinction between associations which do or do not truly reflect the self, but that instead the distinction between personal and extra-personal associations should be understood in terms of an individual’s subjective sense of authorship.

The debate as to which processes best define “true forgiveness” may reflect this more fundamental debate regarding the nature of the true self. When someone asks “do I truly forgive?” they must determine what “I” refers to. If one’s explicit mind (System 2) forgives, but their implicit mind (System 1) does not, then the two Systems are pitted against each other as determinants of one’s true self. The answer as to which System best
represents the individual, may have more to do with the individual’s personal sense of ownership than with the nature of the processes themselves.

Individuals who define forgiveness by System 1 processes may be the same individuals who also regard implicit responses as those which best reveal an individual’s true nature. Conversely, individuals who define forgiveness by System 2 processes may be the same individuals who also regard explicit processes as those which best reveal an individual’s true nature. Future research may test this hypothesis by examining if individual differences in conceptions of the true self do in fact co-vary with conceptions of forgiveness. This reasoning further suggests that when discussing the true nature of forgiveness with patients, clinicians must be aware of the impact of simultaneously communicating about the nature of the true self, as altering a patient’s understanding of the self is likely to have effects that reach beyond the realm of forgiveness.

Further Applications of Dual-Process Theory to Forgiveness Therapy and Research

The theoretical background provided by dual-process theory may provide unique insights into other little understood findings within forgiveness research, and help to generate new hypotheses that can then be tested empirically using techniques already mastered by dual-process researchers. For example, forgiveness researchers have suggested that the way that an individual experiences forgiveness may have important implications for how it affects health and well-being (Rye et al. 2001; Worthington, Witvliet, Pietrini, & Miller, 2007). Thus, aside from meeting different definitions of forgiveness, forgiveness that arises out of System 1 processing or System 2 processing may have different emotional consequences and implications for well-being (c.f. DeCourville et al., 2008). Under some circumstances, forgiveness motivated by System
2, analytic decision making may lead to less congruent emotional effects and therefore fewer positive consequences for health and well-being than forgiveness that arises from implicit System 1 reactions and changes within the associative network that System 1 processing draws upon. (However, see below for a scenario in which such forgiveness could hasten the improvement of well-being following a transgression).

As discussed in the Introduction (see Models of Forgiveness), Worthington and his colleagues (2007) have distinguished between two types of forgiveness: decisional forgiveness and emotional forgiveness. Decisional forgiveness was defined as the decision to change behavioural responses to the transgressor, whereas emotional forgiveness was defined as a transformation in which negative, "unforgiving" emotions are replaced with positive ones. They argue that decisional forgiveness may be related to health only by decreasing hostility and therefore increasing social support, whereas emotional forgiveness may be directly related to positive health outcomes by reducing negative affect and stress. Evidence for this assertion may be drawn from the finding that those who have seen forgiveness as motivated by a sense of obligation (motivated by religious or social beliefs) have experienced more residual anger towards a transgressor and higher blood pressure as compared to those who have seen forgiveness as motivated by love for the offender (Huang & Enright, 2000).

There are multiple ways we might understand this in terms of the two systems posited by dual-process theory. One interpretation would be that reasoning through System 2 processing led these individuals to the conclusion that forgiveness would be in accordance with their beliefs and therefore would be the correct choice. Alternatively, it is possible that individuals who see forgiveness as motivated by a sense of obligation,
would have a pre-existing association, or make use of an automatic, "must forgive in all situations" heuristic. This could then lead to post-hoc rationalizations through System 2 processing, and the decision to forgive. It is unlikely that processes in either alternative would lead to changes in their associations with the offender or with their experiences of the transgression within the associative network, which is potentially a vital System 1 process to relieve negative affect and stress.

In a similar example, as discussed in the Introduction (see Models of Forgiveness), Trainer (1981) differentiates between three different types of forgiveness. Role-expected forgiveness and expedient forgiveness are externally motivated by social expectations and goals, as well as practical considerations, and are thus largely cognitive and behavioural. Intrinsic forgiveness, however, refers to forgiveness that is intrinsically motivated and involves not only cognitive and behavioural change, but affective change as well. Trainer found role-expected and expedient forgiveness to be associated with anxiety, fear, and hostility, each of which has been related to reduced well-being. On the other hand, Trainer found no such association with intrinsic forgiveness. However, future studies are required to determine if this is because System 1 versus System 2 processes regarding forgiveness lead to different levels of negative affect, or if fear or anxiety lead to role-expected or expedient forgiveness.

Case studies have suggested that a conscious decision to forgive, made in the absence of the affective experience of forgiveness, may lead to a more holistic forgiveness within a short period of time (DiBlasio, 1998; 2000). Reports of these case studies were based on forgiveness oriented therapy sessions at the time of the decision to forgive, and follow-up either by telephone or in person two or six years later,
respectively. If these findings can be replicated in future research, dual-process theory may help to elucidate this phenomenon by accounting for how the two systems interact.

For example, if a conscious decision to forgive is made, often paired with a conscious effort to change cognitions, an offended party may choose to think of the benefits of the decision to forgive rather than focus on their hurt each time the transgressor comes to mind. This would result in repeated mental pairings of the transgressor with a more positive stimulus. This may change the offended party’s associations with the offender, allowing emotions originating in System 1 to change with time.

It is interesting to note that DiBlasio’s findings seemingly contradict those of previous researchers who have found that affective change, and its consequences for well-being, do not follow from a cognitive decision to forgive motivated by social goals or pressures. It may be that these particular motivations are less likely to create an effective positive stimulus, or that the previous studies did not allow enough time for this affective change to occur. Dual-process theory provides a theoretical background that may be used to create and test hypotheses such as these.

Recall that participants in the “unresolved forgiveness” factor in Stewart et al.’s (2010) study strongly agreed with statements indicating that they continued to feel anger and resentment towards the transgressor. It is of further interest that these same participants indicated stronger agreement with statements such as “I forgave the person who hurt me because I knew it would make me feel better” and “I forgave the person who hurt me to get rid of my feelings of anger and resentment for what s/he did” as compared to participants in the other two factors. Thus, it would seem that it is when
people are motivated to forgive by the desire to feel better that participants are less likely
to feel better.

This seemingly paradoxical finding may be better understood from a dual-process perspective. If the reason that some individuals forgive is that they want to feel better, then these individuals must not have felt good prior to forgiving. This means that these individuals’ decisions to forgive were not initiated by an implicit affective change, but instead occurred through conscious cognitive processing. Because emotions are largely the result of System 1 processing, these individuals do not have direct conscious control over their emotions and so a direct attempt to change this implicit affective level was ineffective. It would only be by creating new associations or by finding new affectively laden reasons to forgive, which would act as natural stimuli to System 1 processing, that one could then proceed from deciding to forgive at a conscious cognitive level, to forgiving at an implicit affective level. If the other participants in Stewart et al.’s (2010) study had first found implicit affective reasons to forgive, such as out of love or compassion, then these individuals would have already begun the affective changes that the participants that characterized the unresolved forgiveness factor had considered to be the benefit of forgiveness.

Glucose acts as a primary fuel for effortful processing, and a lack of glucose has been shown to inhibit System 2, but not System 1 (Galliot & Baumeister, 2007; Masicampo & Baumeister, 2008). It is therefore interesting to note that those high in symptoms of type 2 diabetes, who are more likely to have low levels of glucose, have been shown to be less likely to forgive (DeWall, Pond, & Bushman, 2010). It may be that, with System 2 inhibited, many diabetics are unable to overcome residual anger or
hurt in cases where others would be motivated by situational factors to use System 2 to override unforgiving impulses. Future research may explore this hypothesis.

In the Introduction I discussed three different ways of interpreting the many processes which underlie lay and scholarly definitions of forgiveness. We may see forgiveness as having a set of critical processes, as having a single core process with multiple correlates, or as taking many forms. Which answer we ultimately choose is perhaps but a matter of semantics; however, its implications for how we communicate with lay people and others within academia has real world consequences.

In the clinical world, if clients are told that their current views of forgiveness are incorrect, it may change their approaches to forgiveness and how they feel about their experiences with what they considered forgiveness. It is yet unknown if clients would then be more likely to experience "true forgiveness", or if they would only find themselves less satisfied with their current states. For research and the advancement of theory, the consequences of disregarding alternative definitions of forgiveness are more predictable.

Already there has been multiple calls for researchers to take note of the varying conceptions of forgiveness that may be held, as these conceptions will influence how participants will interpret and respond to forgiveness-related questions, and ultimately will influence the understanding of forgiveness and its consequences that is then derived from research (DeCourville et al., 2008; Rye et al. 2001; Thompson & Snyder, 2004; Witvliet 2001). Those who fail to take this into account will find mixed results, or else results that differ from sample to sample. Even when explicitly instructed as to how to define forgiveness, participants are likely to disregard such instructions as past research
has found that even after a four-week educational program, participants have retained conceptions of forgiveness that their teachers rejected (Hui & Ho, 2004).

For these reasons, whether scholars choose to accept only a single definition of forgiveness, accept all cases of forgiveness as identified by the forgiver as different forms of forgiveness, or decide to view each process as a component of forgiveness, care must be taken in dealing with the consequences. If scholars wish to maintain a single definition of forgiveness at least two steps must be taken.

First, researchers must be conscientious of the diversity of conceptions of forgiveness that may be applied by lay persons when the term “forgiveness” is used in instructions or questionnaires. Second, those constructs and conceptions that the researcher distinguishes from true forgiveness must be assigned new terminology, and be studied separately. The experiences that have been termed pseudo-forgiveness or false forgiveness (e.g. Enright et al., 1991) are equally unlikely to cohere to a single definition, and are just as common, if not more common, than what a researcher considers to be true forgiveness. Similar precautions must be taken if forgiveness is viewed as having varying degrees of completeness or different forms. Each component or form must be recognized, named, and its separate consequences and interactions with other components documented. Exploring dual-process theory in the context of forgiveness represents a first step in dealing with these challenges because it may allow us to better understand the multiple parallel processes that may be included in a definition of forgiveness, and provides new terminology through which the characteristics of these processes may be discussed.
There are many ways that dual-process theory may also help to inform therapeutic practices aimed at forgiveness. It is possible that when clinicians wish to create cognitive change, as in the case when a patient wants to forgive, they may have more success if they can identify whether this change needs to occur within System 1 or System 2 processes and then use strategies for change that are tailored to that system. This would be consistent with the stimulus Smith and Neumann's (2005) suggestion that emotions originating from System 2 processing, that is to say those that are evoked by conscious, cognitive appraisal, may be affected by reappraisal, whereas those originating from System 1 processing may only be changed by altering input.

Brewin (1989) has similarly provided therapists with recommendations for bringing about cognitive change that distinguish between creating change amongst verbally accessible knowledge (System 2 processing), creating change in the nature and intrusiveness of unconscious memories (System 1 processing), and creating change in conscious-strategies for self-regulation (how System 2 processes moderate System 1 processes). Each of these strategies were designed to be compatible with the degree of consciousness and automaticity of each change and may be appropriate within the context of unwanted unforgiveness. Future research may build on Brewin's recommendations to create similarly tailored strategies that are specific to the types of change required to forgive.

The Implications of Future Research for Clinical Psychology

As previously noted, the literature on dual-process theory in cognitive and social psychology is vast. Dual-process theory has been slower to enter the clinical domain, but a modest number of dual-process models now exist within clinical psychology (e.g.
Beevers, 2005; Brewin, 1989; Brewin, Dalgleish, & Joseph, 1996; Epstein, 1994; 1998; Haeffel et al., 2007). Continued research on dual-process theory and forgiveness may, by its contribution, encourage the continued development of dual-process theory within clinical psychology. Thus, research in dual-process theory and research in forgiveness should mutually profit from combined research.

As dual-process theory becomes better understood within the clinical context, therapists may find it useful to describe a simple dual-process theory of mind to patients. Many lay persons are likely to be unaware of automatic mental processes, and are likely to be sceptical of the assertion that their behaviour is affected by automatic processes because this assertion likely does not reflect their subjective experiences. Moreover, an overly deterministic depiction of human nature could foster an external locus of control and its associated consequences for well-being (e.g., Presson & Benassi, 1996). Yet, individuals may benefit from knowing that some of their thoughts, feelings, and behaviours may be determined by processes outside of their awareness. They may feel less frustration when their thoughts and feelings are mixed, or when they react differently to a situation than they had predicted if they can understand why they feel that way. A basic knowledge of dual-process theory may help individuals to understand how automatic processes can exist despite their conscious experiences, and, by positing the coexistence of System 2, may do so without undermining a healthy sense of self-control. Just as the effects of internal and external locus of control have been studied, future research should examine the effects of knowing and/or accepting a dual-process theory of mind.
One might speculate that the reason why dual-process theory has been slower to enter clinical psychology, as compared to cognitive and social psychology, is because of the deeply personal nature of psychotherapy. In this context, one might be particularly reluctant to “reduce” individuals to products of evolution whose behaviours can be determined by the environments that act on them (as in the stimulus-response patterns of System 1). If a dual-process theory of mind, such as that posited by Evans (2009), is to be accepted, it is highly unlikely that an individual has two minds when making social judgements, and has two minds when making decisions, but only has one mind when in a therapist’s office. Clinicians, who must frequently address internal conflict, are no doubt familiar with this fact. However, it would appear that they continue to rely on older, psychoanalytic, models to explain this phenomenon.

Psychoanalytic theory has had many years to convince clinicians that, as both mechanistic and humanistic processes play a significant role in determining human behaviour, the mechanistic (at least as depicted in psychoanalytic theory) is human. Clinicians may be hesitant to accept yet another mechanistic explanation for human behaviour before it has been demonstrated that dual-process theory is as clinically relevant as psychoanalytic theory. By pursuing research on dual-process theory in the highly humanistic field of forgiveness, and determining if dual-process theory can better explain human behaviour and generate more effective clinical practices, we can assist clinicians, researchers, and lay persons to reconcile this impersonal view of mental processes with the desire to see people as human.
Summary and Conclusions

I made three main hypotheses for the research presented here. I predicted that there would be a main effect on forgiveness scores for affective condition, that this effect would be moderated by WML condition, and that the relationship between affective condition and forgiveness would be mediated by implicit attitude. If these hypotheses were supported, it would suggest that System 1 processes can play a role in forgiveness, and that System 2 processes can inhibit the impact of System 1 processes on forgiveness. Each of these hypotheses hinged on the assumption that the conditioning phase of the study would be effective. All evidence indicates that this phase of the study was not effective. As a result no conclusions could be drawn regarding these hypotheses.

My findings did, however, support the view that forgiveness is often experienced as fragmented. My correlational data suggested that on average those who tend to have a positive affective attitude towards someone will also tend have a positive cognitive attitude towards that individual. However, the majority of participants indicated that they had on at least one occasion experienced conflicting thoughts and feelings after forgiving or not forgiving a real transgression. Although this does not provide direct support for my main hypotheses, it does suggest that continued research on potential sources of incongruence between thoughts and feelings in forgiveness is warranted. For example, given my correlational findings, this future research may be used to determine when an individual is likely to experience such internal conflict.

As research within psychology continues to proliferate, it will become increasingly important to create work that is integrative. In creating this thesis I have sought to bring a well-known and well-supported theory to an area of psychology where
it is unknown. With future research we may see both the fields of forgiveness and dual-process theory benefit.
References


Reflections on the complexities of Forgiveness (pp. 93-120). New York: Routledge.


Appendix A

Measures

Ratings of Potential Transgressor Stimuli

Each item was displayed in random order and appeared as depicted in Figure A1.

Based on these photos, how ATTRACTIVE is the woman depicted?

(Press Ctrl + Right Arrow to skip)

<table>
<thead>
<tr>
<th>Not attractive at all</th>
<th>Very Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

Based on these photos, how FAMILIAR is the woman depicted?

(Press Ctrl + Right Arrow to skip)

<table>
<thead>
<tr>
<th>Not familiar at all</th>
<th>Very Familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

Based on these photos, how LIKEABLE is the woman depicted?

(Press Ctrl + Right Arrow to skip)

<table>
<thead>
<tr>
<th>Not likeable at all</th>
<th>Very likeable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
Based on these photos, how ATTRACTIVE is the woman depicted?

(Press Ctrl + Right Arrow to skip)

1 2 3 4 5 6 7
Not attractive at all

Very attractive

Figure A1. Example rating prompt displayed after potential transgressor stimuli.

Ratings of Potential Transgressor Reference Photographs

The same items as used to obtain ratings of the potential transgressor stimuli for the conditioning phase of the main study were used to obtain ratings of the potential reference photographs that could be used to accompany the dependent measures in the main study. An example of how these items appeared is depicted in Figure A2.
Based on this photo, how LIKEABLE is the woman depicted?

(Press Ctrl + Right Arrow to skip)

Not likeable at all

1 2 3 4 5 6 7

Very likeable

Figure A2. Example display with potential transgressor reference photograph and rating prompt.

Ratings of Potential Pleasant and Unpleasant Stimuli

The instructions were displayed as depicted in Figure A3.

Please rate the following pictures based on your INITIAL reaction as to how pleasant or unpleasant they are.

1 will indicate extremely unpleasant, and 12 will indicate extremely pleasant.

Please press the spacebar to continue.

Figure A3. Pleasantness rating instructions.

The same rating scale, displayed below, accompanied each potential pleasant or unpleasant stimulus for the conditioning phase of the main study, which were displayed in random order. These items appeared as depicted in Figure A4.
Please rate the following picture based on your INITIAL reaction as to how pleasant or unpleasant it is.

(Press Ctrl + Right Arrow to skip)

<table>
<thead>
<tr>
<th>Extremely Unpleasant</th>
<th>Extremely Pleasant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

*Figure A4. Example display with potential pleasant stimulus and rating prompt.*

**Cognitive Attitude Towards The Transgressor**

Participants were instructed “Please indicate whether or not each word describes a trait belonging to PATRICIA by clicking on the corresponding number.”
Press the spacebar to continue.” The items below, each accompanied by the reference photo of the transgressor, were displayed in a random order. An example item is depicted in Figure A5.

1) Useful

<table>
<thead>
<tr>
<th>Does Not Describe Patricia</th>
<th>Slightly Describes Patricia</th>
<th>Definitely Describes Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

2) Wise

<table>
<thead>
<tr>
<th>Does Not Describe Patricia</th>
<th>Slightly Describes Patricia</th>
<th>Definitely Describes Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

3) Safe

<table>
<thead>
<tr>
<th>Does Not Describe Patricia</th>
<th>Slightly Describes Patricia</th>
<th>Definitely Describes Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

4) Beneficial

<table>
<thead>
<tr>
<th>Does Not Describe Patricia</th>
<th>Slightly Describes Patricia</th>
<th>Definitely Describes Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

5) Valuable

<table>
<thead>
<tr>
<th>Does Not Describe Patricia</th>
<th>Slightly Describes Patricia</th>
<th>Definitely Describes Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

6) Perfect

<table>
<thead>
<tr>
<th>Does Not Describe Patricia</th>
<th>Slightly Describes Patricia</th>
<th>Definitely Describes Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wholesome</td>
<td></td>
<td>Useless</td>
</tr>
<tr>
<td>---</td>
<td>-----------</td>
<td>---</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>Does Not Describe Patricia</td>
<td>Slightly Describes Patricia</td>
<td>Definitely Describes Patricia</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>N/A</td>
</tr>
</tbody>
</table>
14) Unhealthy

<table>
<thead>
<tr>
<th>Does Not Describe Patricia</th>
<th>Slightly Describes Patricia</th>
<th>Definitely Describes Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Does this word describe a trait belonging to Patricia?

Imperfect

Figure A5, Example display with cognitive attitude rating prompt.

**Affective Attitude Towards the Transgressor**

Participants were instructed “Please indicate whether or not each word describes your feelings toward PATRICIA. Press the spacebar to continue.” The affective attitude items below followed the same format as the cognitive attitude items, depicted in Figure A5, and were displayed in random order.

1) Love

<table>
<thead>
<tr>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
2) Delighted

<table>
<thead>
<tr>
<th>Does Not Describe</th>
<th>Slightly Describes</th>
<th>Definitely Describes</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Feelings</td>
<td>My Feelings</td>
<td>My Feelings</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

3) Happy

<table>
<thead>
<tr>
<th>Does Not Describe</th>
<th>Slightly Describes</th>
<th>Definitely Describes</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Feelings</td>
<td>My Feelings</td>
<td>My Feelings</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

4) Calm

<table>
<thead>
<tr>
<th>Does Not Describe</th>
<th>Slightly Describes</th>
<th>Definitely Describes</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Feelings</td>
<td>My Feelings</td>
<td>My Feelings</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

5) Excited

<table>
<thead>
<tr>
<th>Does Not Describe</th>
<th>Slightly Describes</th>
<th>Definitely Describes</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Feelings</td>
<td>My Feelings</td>
<td>My Feelings</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

6) Relaxed

<table>
<thead>
<tr>
<th>Does Not Describe</th>
<th>Slightly Describes</th>
<th>Definitely Describes</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Feelings</td>
<td>My Feelings</td>
<td>My Feelings</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

7) Acceptance

<table>
<thead>
<tr>
<th>Does Not Describe</th>
<th>Slightly Describes</th>
<th>Definitely Describes</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Feelings</td>
<td>My Feelings</td>
<td>My Feelings</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
8) Joy

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

9) Hateful

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

10) Sad

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

11) Annoyed

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

12) Tense

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

13) Bored

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
14) Angry

<table>
<thead>
<tr>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

15) Disgusted

<table>
<thead>
<tr>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

16) Sorrow

<table>
<thead>
<tr>
<th>Does Not Describe My Feelings</th>
<th>Slightly Describes My Feelings</th>
<th>Definitely Describes My Feelings</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**General Attitude Towards the Transgressor**

For this measure participants were instructed “Please indicate whether or not each word describes your general evaluation of PATRICIA by clicking on the corresponding number. Press the spacebar to continue.” The general attitude items below followed the same format as the cognitive attitude items, depicted in Figure A5, and were displayed in random order.

1) Positive

<table>
<thead>
<tr>
<th>Does Not Describe My Attitude toward Patricia</th>
<th>Slightly Describes My Attitude toward Patricia</th>
<th>Definitely Describes My Attitude toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
2) **Like**

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Attitude toward Patricia</th>
<th>Slightly Describes My Attitude toward Patricia</th>
<th>Definitely Describes My Attitude toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) **Good**

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Attitude toward Patricia</th>
<th>Slightly Describes My Attitude toward Patricia</th>
<th>Definitely Describes My Attitude toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4) **Desirable**

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Attitude toward Patricia</th>
<th>Slightly Describes My Attitude toward Patricia</th>
<th>Definitely Describes My Attitude toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5) **Negative**

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Attitude toward Patricia</th>
<th>Slightly Describes My Attitude toward Patricia</th>
<th>Definitely Describes My Attitude toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6) **Dislike**

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Attitude toward Patricia</th>
<th>Slightly Describes My Attitude toward Patricia</th>
<th>Definitely Describes My Attitude toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7) Bad

<table>
<thead>
<tr>
<th>Does Not Describe My Attitude toward Patricia</th>
<th>Slightly Describes My Attitude toward Patricia</th>
<th>Definitely Describes My Attitude toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

8) Undesirable

<table>
<thead>
<tr>
<th>Does Not Describe My Attitude toward Patricia</th>
<th>Slightly Describes My Attitude toward Patricia</th>
<th>Definitely Describes My Attitude toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Behaviour Towards the Transgressor**

For this measure participants were instructed “Please indicate whether or not each word describes your future behaviour toward PATRICIA by clicking on the corresponding number. Press the spacebar to continue.” The behaviour items below followed the same format as the cognitive attitude items, depicted in Figure A5, and were displayed in random order.

1) Aggressive

<table>
<thead>
<tr>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

2) Avoidant

<table>
<thead>
<tr>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
3) Malevolent

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>☐</td>
</tr>
</tbody>
</table>

4) Unfriendly

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>☐</td>
</tr>
</tbody>
</table>

5) Cold

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>☐</td>
</tr>
</tbody>
</table>

6) Gentle

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>☐</td>
</tr>
</tbody>
</table>

7) Attentive

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>☐</td>
</tr>
</tbody>
</table>
8) Benevolent

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patricia</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

9) Friendly

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patricia</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

10) Warm

<table>
<thead>
<tr>
<th></th>
<th>Does Not Describe My Behavior toward Patricia</th>
<th>Slightly Describes My Behavior toward Patricia</th>
<th>Definitely Describes My Behavior toward Patricia</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patricia</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Potential GNAT Attribute Stimuli Ratings

For this measure participants were instructed:

We would now like to know what you consider good and bad. Please rate the following items based on how quickly and easily you can categorize each as representing "good" or "bad."

1 will indicate Very Clearly Bad, and 10 will indicate Very Clearly Good.

Please press the spacebar to continue.

The potential GNAT attribute stimuli were presented in random order. The same rating scale accompanied each potential stimulus:
See Figure A6 for an example of how these items appeared.

![Figure A6. Example display for potential GNAT attribute stimuli ratings.](image)

**Brief Mood Introspection Scale**

For the BMIS (Mayer, J. D., & Gaschke, 1988), participants were instructed “Please select the response on the scale below that indicates how well each adjective or phrase describes your present mood.” The items appeared in the following order, on a single screen with a scrollbar (see Figure A7).

1. **Lively**

<table>
<thead>
<tr>
<th>XX</th>
<th>X</th>
<th>V</th>
<th>VV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>Do Not Feel</td>
<td>Slightly Feel</td>
<td>Definitely Feel</td>
</tr>
</tbody>
</table>
2. **Happy**

<table>
<thead>
<tr>
<th></th>
<th>XX</th>
<th>X</th>
<th>V</th>
<th>VV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>Do Not Feel</td>
<td>Do Not Feel</td>
<td>Slightly Feel</td>
<td>Definitely Feel</td>
</tr>
</tbody>
</table>

3. **Sad**

<table>
<thead>
<tr>
<th></th>
<th>XX</th>
<th>X</th>
<th>V</th>
<th>VV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>Do Not Feel</td>
<td>Do Not Feel</td>
<td>Slightly Feel</td>
<td>Definitely Feel</td>
</tr>
</tbody>
</table>

4. **Tired**

<table>
<thead>
<tr>
<th></th>
<th>XX</th>
<th>X</th>
<th>V</th>
<th>VV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>Do Not Feel</td>
<td>Do Not Feel</td>
<td>Slightly Feel</td>
<td>Definitely Feel</td>
</tr>
</tbody>
</table>

5. **Caring**

<table>
<thead>
<tr>
<th></th>
<th>XX</th>
<th>X</th>
<th>V</th>
<th>VV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>Do Not Feel</td>
<td>Do Not Feel</td>
<td>Slightly Feel</td>
<td>Definitely Feel</td>
</tr>
</tbody>
</table>

6. **Content**

<table>
<thead>
<tr>
<th></th>
<th>XX</th>
<th>X</th>
<th>V</th>
<th>VV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>Do Not Feel</td>
<td>Do Not Feel</td>
<td>Slightly Feel</td>
<td>Definitely Feel</td>
</tr>
</tbody>
</table>

7. **Gloomy**

<table>
<thead>
<tr>
<th></th>
<th>XX</th>
<th>X</th>
<th>V</th>
<th>VV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>Do Not Feel</td>
<td>Do Not Feel</td>
<td>Slightly Feel</td>
<td>Definitely Feel</td>
</tr>
</tbody>
</table>

8. **Jittery**

<table>
<thead>
<tr>
<th></th>
<th>XX</th>
<th>X</th>
<th>V</th>
<th>VV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>Do Not Feel</td>
<td>Do Not Feel</td>
<td>Slightly Feel</td>
<td>Definitely Feel</td>
</tr>
<tr>
<td></td>
<td>Drowsy</td>
<td></td>
<td>Grouchy</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------</td>
<td>---</td>
<td>----------------------------</td>
<td>---</td>
</tr>
<tr>
<td>9</td>
<td>XX</td>
<td>X</td>
<td>V</td>
<td>VV</td>
</tr>
<tr>
<td></td>
<td>Definitely</td>
<td></td>
<td>Definitely</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do Not Feel</td>
<td></td>
<td>Do Not Feel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slightly Feel</td>
<td></td>
<td>Slightly Feel</td>
<td></td>
</tr>
</tbody>
</table>
16. Active

XX | X | V | VV
Definitely Do Not Feel Do Not Feel Slightly Feel Definitely Feel

Overall, my mood is:

Very Unpleasant
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

Very Pleasant

Figure A7. Initial display of the BMIS.

Attention to Affective Stimuli

The extent to which participants attended to affective stimuli during the conditioning phase of the study was measured with the following item:
If you found yourself in the distractor condition, were you able to disattend to the images when they appeared on the screen or did you find they grabbed your attention?

☐ Yes, I was able to ignore the distractor images
☐ No, I could not stop looking at the distractor images

**Subjective Awareness Of The Affective Stimuli**

To assess if participants were subjectively aware of the affective stimuli during the conditioning phase of the study they were first asked:

Did you see anything strange during the slide show?

☐ Yes ☐ No

Participants who responded “Yes” were instructed “Please describe what you saw that was strange.” The following item was then displayed to all participants.

Did you see any images flash on the screen before the target and the images of Patricia?

☐ Yes ☐ No

Participants who responded “Yes” were then asked, “Please describe the image(s) that you saw.”

**Transgression-Related Interpersonal Motivations Inventory (TRIM)**

All items from the TRIM (McCullough et al., 2006), except for the first, were displayed in random order. The first of the following items, which was used as the measure of forgiveness as defined by the participant, was always displayed before the
others. Each item was accompanied by the reference photo of the transgressor as were the attitude items (see Figure A5).

1) I forgive her for what she did to me.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2) I’ll make her pay.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3) I am trying to keep as much distance between us as possible.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

4) Even though her actions hurt me, I have goodwill for him/her.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

5) I wish that something bad would happen to her.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

6) I am living as if she doesn’t exist, isn’t around.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
7) I want us to bury the hatchet and move forward with our relationship.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

8) I don't trust her.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

9) Despite what she did, I want us to have a positive relationship again.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

10) I want her to get what she deserves.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

11) I am finding it difficult to act warmly toward her.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

12) I am avoiding her.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

13) Although she hurt me, I am putting the hurts aside so we could resume our relationship.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
14) I’m going to get even.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

15) I cut off the relationship with her.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

16) I have released my anger so I can work on restoring our relationship to health.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

17) I want to see her hurt and miserable.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

18) I withdraw from her.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Working Memory Load Maintenance**

To assess if the memorized digits were maintained in working memory, participants were asked the following questions in the stated order.

1) How hard was it to remember the numbers you were asked to memorize?

<table>
<thead>
<tr>
<th>Very Easy</th>
<th>Very Hard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

2) Were you rehearsing the numbers in your mind as you completed the study?

☐ Yes, constantly or almost constantly
Yes, once in a while

No, or hardly at all

Tendency To Forgive

The Tendency To Forgive scale (Brown, 2003) was displayed on a single screen with a scroll bar and contained the following instructions and items in the stated order.

Please use the following scale to rate your agreement/disagreement with each statement:

1. I tend to get over it quickly when someone hurts my feelings.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

2. If someone wrongs me, I often think about it a lot afterwards

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

3. I have a tendency to harbor grudges.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

4. When people wrong me, my approach is just to forgive and forget.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
Transgression Comprehension Questionnaire

The following questions were displayed individually in the stated order. Participants were provided with a text field where they could type the answer for each question (see Figure A8).

1) In the offence described, what did Patricia offer to do for you?
2) What distracted Patricia from doing what she said she would do?

Figure A8. Example display for comprehension questions.

Remaining Items Regarding Forgiveness and Transgressions

Each of the following items were displayed individually in the stated order (except when otherwise indicated). Open-ended questions were accompanied by a large text field (for an example see Figure A9).
1) “Forgiveness” means different things to different people. What does it mean to you?

2) Independent of circumstance, how good or bad would you say forgiveness is in general?

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Very Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

3) In general, how good or bad is it when a friend is irresponsible about things that affect you?

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Very Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

4) In general, how good or bad is it when friend breaks a promise?

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Very Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

5) In general, how good or bad is it when a friend does not live up to an agreement?

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Very Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

6) In general, how good or bad is it when you miss out on an opportunity?

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Very Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
7) In general, how good or bad is it to get a new job?

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Very Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

8) a. After you believe you have forgiven a person, have you ever found you still feel angry or upset from time to time?

☐ Yes  ☐ No

Participants who answered “No” to question 8a were immediately given question 9a and those who answered “Yes” were given the following instructions and questions b through d on a single screen.

You have indicated that you have previously found that you were still angry or upset from time to time after forgiving a person. Please tell us about your experience.

b. Did it surprise or trouble you?

c. Did it make you doubt whether you have actually forgiven?

d. How common is it for you to have such mixed feelings and/or thoughts when forgiving someone?

[In order to protect the identity of others involved in the transgression please do not provide identifying information, such as names, classes they have attended etc.]

9) a. Have you ever believed that you had not forgiven a person but found you still feel love or affection for that person from time to time?

☐ Yes  ☐ No

Participants who answered “No” to question 9a were immediately given question 10 and those who answered “Yes” were given the following instructions and questions b through d on a single screen.

You have indicated that you have previously found that you still loved for felt affection for someone that you had NOT forgiven. Please tell us about your experience.
b. Did it surprise or trouble you?

c. Did it make you doubt whether you have actually forgiven?

d. How common is it for you to have such mixed feelings and/or thoughts when forgiving someone?

[In order to protect the identity of others involved in the transgression please do not provide identifying information, such as names, classes they have attended etc.]

10) When you forgive, do you ALWAYS feel every part of you has forgiven?

☐ Yes, certainly ☐ I am not sure ☐ No

11) Once you have made a decision as to whether or not you forgive, do you find that all your thoughts and feelings agree?

☐ Yes, certainly ☐ I am not sure ☐ No

12) We are also interested in learning more about why people forgive or don't forgive. Please think of the last time you forgave someone. Why did you forgive her or him? [In order to protect your identity and the identity of others involved in the transgression please do not provide any identifying information (e.g. names, classes attended etc.)]

13) Please think of a time when you did NOT forgive. Why did you not forgive? In order to protect your identity and the identity of others involved in the transgression please do not provide any identifying information (e.g. names, classes attended etc.)

14) Have you ever experienced a transgression similar to that described in the study (i.e. has anyone behaved towards you as Patricia did in the story)?

☐ Yes ☐ No

Participants who answered “Yes” to question 14 were given the following instructions and question. Participants who answered “No” were shown the next questionnaire.

Please describe how the transgression was similar. [In order to protect your identity and the identity of others involved in the transgression please do not provide any identifying information (e.g. names, classes attended etc.)]
How hurtful was this experience?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Very Hurtful</th>
<th>5</th>
</tr>
</thead>
</table>

1. " Forgiveness" Means different things to different people. What does it mean to you?  
   Please click "continue" when you are finished writing your answer.

**Figure A9.** Display for open-ended item requesting the participant’s personal definition of forgiveness.

**Experience With The Name Patricia**

All participants were asked the following.

In your real life, have you ever known someone named Patricia?

☐ Yes  ☐ No
Feedback Questionnaire

Participants were asked the following instructions and questions individually and in the order stated.

The study is almost complete. We would now like some feedback about your experience participating in this study.

1. What do you think was the purpose of this study?

Please click "continue" when you are finished writing your answer.

2. What do you think are the researchers' hypotheses for this study?

3. We appreciate the time you have taken to complete this study. As our methods are constantly being developed we would be interested to hear any comments you have on the study or your experience of forgiveness. Please let us know if you found any of the directions confusing or if you feel we could have improved the study in another way.

Demographics

Participants were shown each of the following items individually and in the following order (unless otherwise specified).

1) Biological Sex: □ Female □ Male □ Other
   (Please specify)

2) How old are you? ____________

3) Are you currently completing a Bachelor's degree?

Participants who responded “Yes” were asked questions 4 and 5, participants who responded “No” were asked question 6. All participants were then asked questions 7 through 10.

4) In what year of post-secondary education are you currently enrolled?
   □1 □2 □3 □4 Other____
5) What is your Major?

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

☐ Some high school or less  ☐ Graduated high school  ☐ Some college/university  ☐ Completed Bachelor’s degree  ☐ Completed associate or technical degree  ☐ Graduate or professional degree  ☐ Other (Specify)

7) Citizen status:
☐ Aboriginal  ☐ Canadian  ☐ Landed Immigrant  ☐ Visitor/Student Visa  ☐ Other

8) Relationship Status:
☐ Single  ☐ In a relationship  ☐ Married or live together  ☐ Separated  ☐ Divorce  ☐ Widowed

9) To which cultural/ethnic/racial group do you belong?

10) What is your religious background?
☐ No religious affiliation  ☐ Catholic  ☐ Protestant  ☐ Eastern Orthodox  ☐ Jewish  ☐ Muslim  ☐ Buddhist  ☐ Hindu  ☐ Sikh  ☐ Other (please specify)

9) Do you consider yourself religious?

☐ Yes, definitely  ☐ Yes, somewhat  ☐ No, not at all

Participants who responded “Yes, definitely” or “Yes, somewhat” were asked the following question.

How important is your religion to you?

<table>
<thead>
<tr>
<th>Not Important at all</th>
<th>Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B

Visual Stimuli

Positive Affective Stimuli

Figure B1. Positive Affective Stimulus
Figure B2. Positive Affective Stimulus.

Figure B3. Positive Affective Stimulus.
Figure B4. Positive Affective Stimulus.

Figure B5. Positive Affective Stimulus.
Figure B6. Positive Affective Stimulus.

Figure B7. Positive Affective Stimulus.
Figure B8. Positive Affective Stimulus.

Figure B9. Positive Affective Stimulus.
Figure B10. Positive Affective Stimulus.
Negative Affective Stimuli

Figure B11. Negative Affective Stimulus.

Figure B12. Negative Affective Stimulus.
Figure B13. Negative Affective Stimulus.

Figure B14. Negative Affective Stimulus.
Figure B15. Negative Affective Stimulus.

Figure B16. Negative Affective Stimulus.
Figure B17. Negative Affective Stimulus.

Figure B18. Negative Affective Stimulus.
Figure B19. Negative Affective Stimulus.

Figure B20. Negative Affective Stimulus.
Figure B21. Transgressor stimulus used in practice block (the reference photo of the transgressor).
Figure B22. Transgressor stimulus used in practice trial of critical block.

Figure B23. Transgressor stimulus used in practice trial of critical block.
Figure B24. Transgressor stimulus used in practice trial of critical block.

Figure B25. Transgressor stimulus used in practice trial of critical block.
Figure B26. Transgressor stimulus used in practice trial of critical block.

Figure B27. Transgressor stimulus used in practice trial of critical block.
Figure B28. Transgressor stimulus used in critical trial of critical block.

Figure B29. Transgressor stimulus used in critical trial of critical block.
Figure B30. Transgressor stimulus used in critical trial of critical block.

Figure B31. Transgressor stimulus used in critical trial of critical block.
Figure B32. Transgressor stimulus used in critical trial of critical block.

Figure B33. Transgressor stimulus used in critical trial of critical block.
Figure B34. Transgressor stimulus used in critical trial of critical block.

Figure B35. Transgressor stimulus used in critical trial of critical block.
Figure B36. Transgressor stimulus used in critical trial of critical block.

Figure B37. Transgressor stimulus used in critical trial of critical block.
Figure B38. Transgressor stimulus used in critical trial of critical block.

Figure B39. Transgressor stimulus used in critical trial of critical block.
Figure B40. Transgressor stimulus used in critical trial of critical block.

Figure B41. Transgressor stimulus used in critical trial of critical block.
Figure B42. Transgressor stimulus used in critical trial of critical block.

Figure B43. Transgressor stimulus used in critical trial of critical block.
Figure B44. Transgressor stimulus used in critical trial of critical block.

Figure B45. Transgressor stimulus used in critical trial of critical block.
Figure B46. Transgressor stimulus used in critical trial of critical block.

Figure B47. Transgressor stimulus used in critical trial of critical block.
Figure B48. Transgressor stimulus used in critical trial of critical block.

Figure B49. Transgressor stimulus used in critical trial of critical block.
Figure B45. Transgressor stimulus used in critical trial of critical block.

Figure B51. Transgressor stimulus used in critical trial of critical block.
Good Stimuli.

Figure B52. Good stimulus used in practice block.

Figure B53. Good stimulus used in practice block.
Figure B54. Good stimulus used in practice block.

Figure B55. Good stimulus used in practice block.
Figure B56. Good stimulus used in practice block.

Figure B57. Good stimulus used in practice block.
Figure B58. Good stimulus used in practice block.

Figure B59. Good stimulus used in practice block.
Figure B60. Good stimulus used in practice block.

Figure B61. Good stimulus used in practice block.
Figure B62. Good stimulus used in practice trial of critical block.

Figure B63. Good stimulus used in practice trial of critical block.
Figure B64. Good stimulus used in practice trial of critical block.

Figure B65. Good stimulus used in practice trial of critical block.
Figure B66. Good stimulus used in practice trial of critical block.

Figure B67. Good stimulus used in practice trial of critical block.
Figure B68. Good stimulus used in practice trial of critical block.

Figure B69. Good stimulus used in practice trial of critical block.
Figure B70. Good stimulus used in practice trial of critical block.

Figure B71. Good stimulus used in practice trial of critical block.
Figure B72. Good stimulus used in practice trial of critical block.

Figure B73. Good stimulus used in practice trial of critical block.
Figure B74. Good stimulus used in practice trial of critical block.

Figure B75. Good stimulus used in practice trial of critical block.
Figure B76. Good stimulus used in practice trial of critical block.

Figure B77. Good stimulus used in critical trial of critical block.
Figure B78. Good stimulus used in critical trial of critical block.

Figure B79. Good stimulus used in critical trial of critical block.
Figure B80. Good stimulus used in critical trial of critical block.

Figure B81. Good stimulus used in critical trial of critical block.
Figure B82. Good stimulus used in critical trial of critical block.

Figure B83. Good stimulus used in critical trial of critical block.
Figure B84. Good stimulus used in critical trial of critical block.

Figure B85. Good stimulus used in critical trial of critical block.
Figure B86. Good stimulus used in critical trial of critical block.

Figure B87. Good stimulus used in critical trial of critical block.
Figure B88. Good stimulus used in critical trial of critical block.

Figure B89. Good stimulus used in critical trial of critical block.
Figure B90. Good stimulus used in critical trial of critical block.

Figure B91. Good stimulus used in critical trial of critical block.
Figure B92. Good stimulus used in critical trial of critical block.

Figure B93. Good stimulus used in critical trial of critical block.
Figure B94. Good stimulus used in critical trial of critical block.

Figure B95. Good stimulus used in critical trial of critical block.
Figure B96. Good stimulus used in critical trial of critical block.

Figure B97. Good stimulus used in critical trial of critical block.
Figure B98. Good stimulus used in critical trial of critical block.

Figure B99. Good stimulus used in critical trial of critical block.
Figure B100. Good stimulus used in critical trial of critical block.

Figure B101. Good stimulus used in critical trial of critical block.
Figure B102. Good stimulus used in critical trial of critical block.

Figure B103. Good stimulus used in critical trial of critical block.
Figure B104. Good stimulus used in critical trial of critical block.

Figure B105. Good stimulus used in critical trial of critical block.
Figure B106. Good stimulus used in critical trial of critical block.

Figure B107. Good stimulus used in critical trial of critical block.
Figure B108. Good stimulus used in critical trial of critical block.

Figure B109. Good stimulus used in critical trial of critical block.
Figure B110. Good stimulus used in critical trial of critical block.

Figure B111. Good stimulus used in critical trial of critical block.
Figure B112. Good stimulus used in critical trial of critical block.

Figure B113. Good stimulus used in critical trial of critical block.
**Figure B114.** Good stimulus used in critical trial of critical block.

**Figure B115.** Good stimulus used in critical trial of critical block.
Figure B116. Good stimulus used in critical trial of critical block.

Figure B117. Good stimulus used in critical trial of critical block.
Figure B118. Good stimulus used in critical trial of critical block.

Figure B119. Good stimulus used in critical trial of critical block.
Figure B120. Good stimulus used in critical trial of critical block.

Figure B121. Good stimulus used in critical trial of critical block.
Figure B122. Good stimulus used in critical trial of critical block.

Figure B123. Good stimulus used in critical trial of critical block.
Figure B124. Good stimulus used in critical trial of critical block.

Figure B125. Good stimulus used in critical trial of critical block.
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Figure B127. Good stimulus used in critical trial of critical block.
Figure B128. Good stimulus used in critical trial of critical block.

Figure B129. Good stimulus used in critical trial of critical block.
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Figure B131. Good stimulus used in critical trial of critical block.
Figure B132. Good stimulus used in critical trial of critical block.

Figure B133. Good stimulus used in critical trial of critical block.
Figure B134. Good stimulus used in critical trial of critical block.

Figure B135. Good stimulus used in critical trial of critical block.
Figure B136. Good stimulus used in critical trial of critical block.
Bad Stimuli.

*Figure B13*. Bad stimulus used in practice block.
Figure B138. Bad stimulus used in practice block.

Figure B139. Bad stimulus used in practice block.
Figure B140. Bad stimulus used in practice block.

Figure B141. Bad stimulus used in practice block.
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Figure B147. Bad stimulus used in practice trial in critical block.
Figure B148. Bad stimulus used in practice trial in critical block.

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Figure B151. Bad stimulus used in practice trial in critical block.
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**Figure B155.** Bad stimulus used in practice trial in critical block.
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Figure B176. Bad stimulus used in critical trial in critical block.
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**Figure B178.** Bad stimulus used in critical trial in critical block.
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Figure B220. Bad stimulus used in critical trial in critical block.

Figure B221. Bad stimulus used in critical trial in critical block.
Appendix C

Consent and Debriefing Letters

Note: Original consent and debriefing letters used narrow margins to create appropriate pagination.

Pilot 1 Consent Letter

Consent Letter

Date: October 6, 2011
Project Title: Pleasant and Unpleasant Images
Principal Investigator (PI): Kathryn Belicki, professor
Department of Psychology
Brock University
(905) 688-5550 Ext. 3873, kbelicki@brocku.ca

Student Principal Investigator (SPI): Alicia Rubel, MA candidate
Department of Psychology
Brock University
(905) 688-5550 Ext. 5456, ar10hd@brocku.ca

INVITATION
You are invited to participate in a study that involves research. The purpose of this study is to select stimuli for a future study.

WHAT’S INVOLVED
As a participant, you will be asked to rate the attractiveness, likeableness, familiarity, or pleasantness of different photographs. Participation will take approximately 15 minutes of your time.

POTENTIAL BENEFITS AND RISKS
By completing this study you will be helping to create well designed research and will witness some of the work that goes into research design. There also may be risks associated with participation as you may find some of the images you will be rating unpleasant. While we believe that the risk of you finding this study upsetting is small, at the end of this letter we have provided a list of resources for counseling should you feel upset after the study and wish to obtain help.

CONFIDENTIALITY
All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Once your participation is complete the researchers will have no way of determining which responses belong to you. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research. Your consent form will be stored in a locked lab room and destroyed 10 years after your participation. Consent forms will be stored separately from the data obtained from your responses. Electronic data files, which contain no reference to your identity, will be kept 10 years after publication. Access to these data will be restricted to the researchers associated with the forgiveness lab, Dr. Antonia Mantonakis, and Dr. Michael Busseri. For PSYC 1F90 students: Dr. Kathryn Belicki will not be directly involved in assigning grades for PSYC 1F90. She will not have access to consent forms (which contain participant names) until after PSYC 1F90 grades are filed. Thus, your participation in this study or your choice not to participate in this study will have no effect on your PSYC 1F90 grades.

VOLUNTARY PARTICIPATION
Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any
penalty or loss of benefits to which you are entitled. Once you have submitted your responses they will be anonymous and therefore cannot be destroyed should you wish to withdraw your data after your participation is complete.

**PUBLICATION OF RESULTS**
Results of this study may be published in professional journals and presented at conferences. If you would like feedback about the results of the study the student investigator may provide these results by email if contacted after August 1st 2012.

**CONTACT INFORMATION AND ETHICS CLEARANCE**
If you have any questions about this study or require further information, please contact Kathryn Belicki or Alicia Rubel using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University [insert file #]. If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

If you find participation in this study emotionally distressing and this emotional distress continues several hours after completion of the study we encourage you to contact one of the resources for counseling on the attached sheet.

Thank you for your assistance in this project. Please keep a copy of this form for your records.
The inside of every Bell phone book lists emergency and crisis numbers, including those for phone help lines, women’s centres, sexual assault centres, etc.

For Niagara, those numbers are:

Distress Line (Distress Centre of Niagara, St. Catharines number) 905-688-3711

Niagara Region Sexual Assault Centre 905-682-4584

Women’s Place (St. Catharines) 905-684-8331

To see a Counsellor, here are some local resources:

Brock University Personal Counselling Services 905-688-5550 Ext 4750 (to book an appointment)

St. Catharines General Hospital
   Mental Health Outpatient 905-684-7271, Ext. 46440
   Sexual Assault Treatment 905-684-7271, Ext. 45300

The Yellow Pages list many other psychotherapists with varying training and area of specialty, and also lists some of the major resources for community support and self-help support. There are a number of categories in the Yellow Pages that are relevant. If you look under “Counselling Services” you will find a list of the various categories. If you would like to see a registered psychologist in private practice, most are listed in the Yellow Pages under “Psychologists”.
CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: ________________________________________________________

☐ I would like to receive $5

OR

☐ I would like to receive ½ course credit towards the following course:

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Signature: __________________________________________ Date:

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Debriefing Letter:

Dear Participant,

Thank you very much for your participation in this study. Research such as this depends on participants like you to further the field of psychology.

Background and Purpose of the Study:

By participating in this pilot study you helped to select stimuli for a future study. The future study will be examining unconscious processes that may be involved in forgiveness. For this future study participants will be conditioned to associate a transgressor with either positive or negative attributes. For this we need to select pleasant and unpleasant stimuli. We have asked you to rate photos so that we can determine which best evoke positive and negative emotional reactions. To measure each participant's association with the transgressor participants will be asked to perform a computerized sorting task with pictures of the transgressor and a control woman. For this we need to ensure that the two women are equally attractive so that attractiveness does not affect the test. This is why we have asked participants in this pilot study to rate the attractiveness of each woman.

If you have any questions about this study, please feel free to contact us at any time. The principal student investigator is Alicia Rubel, a graduate student in the Department of Psychology. Alicia Rubel may be reached at arl0hd@brocku.ca. The faculty supervisor is Kathryn Belicki, in the Department of Psychology. Dr. Belicki can be reached at kbelicki@brocku.ca, 905-688-5550 (ext. 3873), office MCB306.

If you have found participation in this study emotionally distressing and this emotional distress continues several hours after completion of the study we encourage you to contact one of the Counselling resources on the sheet we have provided you.

Thank you again!
Pilot 2 Consent Letter

Consent Letter

Date: October 6, 2011
Project Title: Impression Formation and Mood
Principal Investigator (PI): Kathryn Belicki, professor
Department of Psychology
Brock University
(905) 688-5550 Ext. 3873, kbelicki@brocku.ca

Student Principal Investigator (SPI): Alicia Rubel, MA candidate
Department of Psychology
Brock University
(905) 688-5550 Ext. 5456, ar10hd@brocku.ca

INVITATION
You are invited to participate in a study that involves research. The purpose of this study is to investigate the relationship between impression formation and mood.

WHAT’S INVOLVED
As a participant, you will be asked to watch a slide show, fill out surveys and complete two short computerized tasks. Participation will take 15 to 30 minutes of your time.

POTENTIAL BENEFITS AND RISKS
Possible benefits of participation include enjoying trying out the computerized tasks and an opportunity to learn about how psychological research is performed. You may also help society benefit from a better understanding of how the mind works. There also may be risks associated with participation as you experience a depressed mood. You may also find some of the images we show you unpleasant. While we believe that the risk of you finding this study upsetting is small, at the end of this letter we have provided a list of resources for counseling should you feel upset after the study and wish to obtain help.

CONFIDENTIALITY
All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Once your participation is complete the researchers will have no way of determining which responses belong to you. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research. Your consent form will be stored in a locked lab room and destroyed 10 years after your participation. Consent forms will be stored separately from the data obtained from your responses. Electronic data files, which contain no reference to your identity, will be kept 10 years after publication. Access to these data will be restricted to the researchers associated with the forgiveness lab, Dr. Antonia Mantonakis, and Dr. Michael Busseri. For PSYC 1F90 students: Dr. Kathryn Belicki will not be directly involved in assigning grades for PSYC 1F90. She will not have access to consent forms (which contain participant names) until after PSYC 1F90 grades are filed. Thus, your participation in this study or your choice not to participate in this study will have no effect on your PSYC 1F90 grades.

VOLUNTARY PARTICIPATION
Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled. Once you have submitted your responses they will be anonymous and therefore cannot be destroyed should you wish to withdraw your data after your participation is complete.

PUBLICATION OF RESULTS
Results of this study may be published in professional journals and presented at conferences. If you would like feedback about the results of the study the student investigator may provide these results by email after August 1st 2012.
CONTACT INFORMATION AND ETHICS CLEARANCE
If you have any questions about this study or require further information, please contact Kathryn Belicki or Alicia Rubel using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University 11-080. If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

If you find participation in this study emotionally distressing and this emotional distress continues several hours after completion of the study we encourage you to contact one of the resources for counseling on the attached sheet.

Thank you for your assistance in this project. Please keep a copy of this form for your records.
The inside of every Bell phone book lists emergency and crisis numbers, including those for phone help lines, women's centres, sexual assault centres, etc.

For Niagara, those numbers are:

Distress Line (Distress Centre of Niagara, St. Catharines number) 905-688-3711

Niagara Region Sexual Assault Centre 905-682-4584

Women’s Place (St. Catharines) 905-684-8331

To see a Counsellor, here are some local resources:

Brock University Personal Counselling Services 905-688-5550

appointment)

Ext. 4750 (to book an Ext. 3240 (in a crisis situation)

St. Catharines General Hospital

Mental Health Outpatient 905-684-7271, Ext. 46440

Sexual Assault Treatment 905-684-7271, Ext. 45300

The Yellow Pages list many other psychotherapists with varying training and area of specialty, and also lists some of the major resources for community support and self-help support. There are a number of categories in the Yellow Pages that are relevant. If you look under “Counselling Services” you will find a list of the various categories. If you would like to see a registered psychologist in private practice, most are listed in the Yellow Pages under “Psychologists”.
CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: ________________________________________________________

☐ I would like to receive $10

OR

☐ I would like to receive ½ hour course credit towards the following course:

______________________________

Signature: _______________________________________ Date:

____________________________________

____________________________________

Researcher Copy

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: ________________________________________________________

☐ I would like to receive $10

OR

☐ I would like to receive ½ hour course credit towards the following course:

______________________________

Signature: _______________________________________ Date:

____________________________________

____________________________________
Debriefing Letter (For Pilot Study 2):

Dear Participant,

Thank you very much for your participation in this study. Research such as this depends on participants like you to further the field of psychology.

Background and Purpose of the Study:

This study tests ideas from dual-process theory. Dual-process theory puts forth that the human mind operates using two systems: one which operates quickly, effortlessly, and largely outside one's awareness, and a second which operates slowly at the conscious level using rules such as logic. Dual-process models are now common throughout cognitive and social psychology, but have been slow to enter the clinical field. The main hypothesis of the current research is that subconscious processing can influence your impressions about a person.

As you watched the slideshow, between the slides that you could consciously see, we flashed very quickly, so quickly you probably could not see them consciously, either pleasant or unpleasant photos. This will allow us to test whether subconscious processing of pleasant vs. unpleasant photos will affect your mood and your judgments of Patricia. For the purpose of future studies, we also wanted to make sure that participants would not be able to consciously perceive the images we intend to be subliminal.

If you have any questions about this study, please feel free to contact us at any time. The principal student investigator is Alicia Rubel, a graduate student in the Department of Psychology. Alicia Rubel may be reached at ar10hd@brocku.ca. The faculty supervisor is Kathryn Belicki, in the Department of Psychology. Dr. Belicki can be reached at kbelicki@brocku.ca, 905-688-5550 (ext. 3873), office MCB306.

If you have found participation in this study emotionally distressing and this emotional distress continues several hours after completion of the study we encourage you to contact one of the Counseling resources on the sheet we have provided you.

Thank you again!
Consent Letter

Date: October 6, 2011
Project Title: Impression Formation and Mood p2
Principal Investigator (Pl): Kathryn Belicki, professor
Department of Psychology
Brock University
(905) 688-5550 Ext. 3873, kbelicki@brocku.ca

Student Principal Investigator (SPI): Alicia Rubel, MA candidate
Department of Psychology
Brock University
(905) 688-5550 Ext. 5456, ar10hd@brocku.ca

INVITATION
You are invited to participate in a study that involves research. The purpose of this study is to investigate the relationship between impression formation and mood.

WHAT'S INVOLVED
As a participant, you will be asked to watch a slide show, fill out surveys and complete a short computerized task. Participation will take 15 to 30 minutes of your time.

POTENTIAL BENEFITS AND RISKS
Possible benefits of participation include enjoying trying out the computerized tasks and an opportunity to learn about how psychological research is performed. You may also help society benefit from a better understanding of how the mind works. There also may be risks associated with participation as you experience a depressed mood. You may also find some of the images we show you unpleasant. While we believe that the risk of you finding this study upsetting is small, at the end of this letter we have provided a list of resources for counseling should you feel upset after the study and wish to obtain help.

CONFIDENTIALITY
All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Once your participation is complete the researchers will have no way of determining which responses belong to you. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research. Your consent form will be stored in a locked lab room and destroyed 10 years after your participation. Consent forms will be stored separately from the data obtained from your responses. Electronic data files, which contain no reference to your identity, will be kept 10 years after publication. Access to these data will be restricted to the researchers associated with the forgiveness lab, Dr. Antonia Mantonaakis, and Dr. Michael Busseri. For PSYC 1F90 students: Dr. Kathryn Belicki will not be directly involved in assigning grades for PSYC 1F90. She will not have access to consent forms (which contain participant names) until after PSYC 1F90 grades are filed. Thus, your participation in this study or your choice not to participate in this study will have no effect on your PSYC 1F90 grades.

VOLUNTARY PARTICIPATION
Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled. Once you have submitted your responses they will be anonymous and therefore cannot be destroyed should you wish to withdraw your data after your participation is complete.

PUBLICATION OF RESULTS
Results of this study may be published in professional journals and presented at conferences. If you would like feedback about the results of the study the student investigator may provide these results by email if contacted after August 1st 2012.
CONTACT INFORMATION AND ETHICS CLEARANCE
If you have any questions about this study or require further information, please contact Kathryn Belicki or Alicia Rubel using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University 11-080. If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

If you find participation in this study emotionally distressing and this emotional distress continues several hours after completion of the study we encourage you to contact one of the resources for counseling on the attached sheet.

Thank you for your assistance in this project. Please keep a copy of this form for your records.
The inside of every Bell phone book lists emergency and crisis numbers, including those for phone help lines, women's centres, sexual assault centres, etc.

For Niagara, those numbers are:

Distress Line (Distress Centre of Niagara, St. Catharines number)  905-688-3711

Niagara Region Sexual Assault Centre  905-682-4584

Women’s Place (St. Catharines)  905-684-8331

To see a Counsellor, here are some local resources:

Brock University Personal Counselling Services

905-688-5550
Ext 4750 (to book an appointment)
Ext 3240 (in a crisis situation)

St. Catharines General Hospital
Mental Health Outpatient  905-684-7271, Ext. 46440
Sexual Assault Treatment  905-684-7271, Ext. 45300

The Yellow Pages list many other psychotherapists with varying training and area of specialty, and also lists some of the major resources for community support and self-help support. There are a number of categories in the Yellow Pages that are relevant. If you look under “Counselling Services” you will find a list of the various categories. If you would like to see a registered psychologist in private practice, most are listed in the Yellow Pages under “Psychologists”.
CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _______________________________________________________

☐ I would like to receive $10

OR

☐ I would like to receive ½ hour course credit towards the following course:

______________________________________________________________

Signature: ___________________________________________ Date:

______________________________________________________________

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Researcher Copy

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _______________________________________________________

☐ I would like to receive $10

OR

☐ I would like to receive ½ hour course credit towards the following course:

______________________________________________________________

Signature: ___________________________________________ Date:

______________________________________________________________
Pilot Study 3 Debriefing Letter

Debriefing Letter (For Pilot Study 2 p2):

Dear Participant,

Thank you very much for your participation in this study. Research such as this depends on participants like you to further the field of psychology.

Background and Purpose of the Study:

This study tests ideas from dual-process theory. Dual-process theory puts forth that the human mind operates using two systems: one which operates quickly, effortlessly, and largely outside one's awareness, and a second which operates slowly at the conscious level using rules such as logic. Dual-process models are now common throughout cognitive and social psychology, but have been slow to enter the clinical field. The main hypothesis of the current research is that subconscious processing can influence your impressions about a person.

As you watched the slideshow, between the slides of “Patricia”, we flashed very quickly, either pleasant or unpleasant photos. This will allow us to test whether exposure to pleasant vs. unpleasant photos will affect your mood and your judgments of Patricia.

If you have any questions about this study, please feel free to contact us at any time. The principal student investigator is Alicia Rubel, a graduate student in the Department of Psychology. Alicia Rubel may be reached at ar10hd@brocku.ca. The faculty supervisor is Kathryn Belicki, in the Department of Psychology. Dr. Belicki can be reached at kbelicki@brocku.ca, 905-688-5550 (ext. 3873), office MCB306.

If you have found participation in this study emotionally distressing and this emotional distress continues several hours after completion of the study we encourage you to contact one of the Counseling resources on the sheet we have provided you.

Thank you again!
Main Study Consent Letter

For Main Study

Consent Letter

Date: October 6, 2011
Project Title: Forgiveness, Memory, & Past Relationships
Principal Investigator (PI): Kathryn Belicki, professor
Department of Psychology
Brock University
(905) 688-5550 Ext. 3873, kbelicki@brocku.ca

Student Principal Investigator (SPI): Alicia Rubel, MA candidate
Department of Psychology
Brock University
(905) 688-5550 Ext. 5456, ar10hd@brocku.ca

INVITATION
You are invited to participate in a study that involves research. The purpose of this study is to investigate the forgiveness process in the context of past relationships, and investigate the role that memory plays in forgiveness.

WHAT'S INVOLVED
As a participant, you will be asked to watch a slide show, memorize numbers, fill out surveys and complete computerized tasks. Participation will take approximately 1 hour of your time.

POTENTIAL BENEFITS AND RISKS
Possible benefits of participation include learning about how you feel about forgiveness, enjoying trying out the computerized tasks and an opportunity to learn about how psychological research is performed. You may also help society benefit from a better understanding of forgiveness. There also may be risks associated with participation as you may be reminded of previous times you have experienced a transgression and feel a depressed mood. You may also find some of the images we show you unpleasant. While we believe that the risk of you finding this study upsetting is small, at the end of this letter we have provided a list of resources for counseling should you feel upset after the study and wish to obtain help.

CONFIDENTIALITY
All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Once your participation is complete the researchers will have no way of determining which responses belong to you. If your written response to any question is quoted in a report or publication of this study it cannot be associated with your name and any other identifying information will be removed. Your consent form will be stored in a locked lab room and destroyed 10 years after your participation. Consent forms will be stored separately from the data obtained from your responses. Electronic data files, which contain no reference to your identity, will be kept 10 year after publication. Access to these data will be restricted to the researchers associated with the forgiveness lab, Dr. Antonia Mantonakis, and Dr. Michael Busserl. For PSYC 1F90 students: Dr. Kathryn Belicki will not be directly involved in assigning grades for PSYC 1F90. She will not have access to consent forms (which contain participant names) until after PSYC 1F90 grades are filed. Thus, your participation in this study or your choice not to participate in this study will have no effect on your PSYC 1F90 grades.

VOLUNTARY PARTICIPATION
Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled. Once you have submitted your responses they will be anonymous and therefore cannot be destroyed should you wish to withdraw your data after your participation is complete.

PUBLICATION OF RESULTS
Results of this study may be published in professional journals and presented at conferences. If you would like feedback about the results of the study the student investigator may provide these results by email if contacted after August 1st 2012.

CONTACT INFORMATION AND ETHICS CLEARANCE
If you have any questions about this study or require further information, please contact Kathryn Belicki or Alicia Rubel using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University 11-080. If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

If you find participation in this study emotionally distressing and this emotional distress continues several hours after completion of the study we encourage you to contact one of the resources for counseling on the attached sheet.

Thank you for your assistance in this project. Please keep a copy of this form for your records.
The inside of every Bell phone book lists emergency and crisis numbers, including those for phone help lines, women's centres, sexual assault centres, etc.

For Niagara, those numbers are:

- Distress Line (Distress Centre of Niagara, St. Catharines number) 905-688-3711
- Niagara Region Sexual Assault Centre 905-682-4584
- Women’s Place (St. Catharines) 905-684-8331

To see a Counsellor, here are some local resources:

- Brock University Personal Counselling Services 905-688-5550
  Ext 4750 (to book an appointment)
  Ext 3240 (in a crisis situation)
- St. Catharines General Hospital
  Mental Health Outpatient 905-684-7271, Ext. 46440
  Sexual Assault Treatment 905-684-7271, Ext. 45300

The Yellow Pages list many other psychotherapists with varying training and area of specialty, and also lists some of the major resources for community support and self-help support. There are a number of categories in the Yellow Pages that are relevant. If you look under “Counselling Services” you will find a list of the various categories. If you would like to see a registered psychologist in private practice, most are listed in the Yellow Pages under “Psychologists”.
CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: ________________________________________________________ 

☐ I would like to receive $10

OR

☐ I would like to receive 1 course credit towards the following course:

____________________________________________________________________

Signature: _____________________________ Date: ______________________________

____________________________________________________________________

____________________________________________________________________

Researcher Copy

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: ________________________________________________________ 

☐ I would like to receive $10

OR

☐ I would like to receive 1 course credit towards the following course:

____________________________________________________________________

Signature: _____________________________ Date: ______________________________

____________________________________________________________________

____________________________________________________________________
Main Study Debriefing Letter

Debriefing Letter (For Main Study):

Dear Participant,

Thank you very much for your participation in this study. Research such as this depends on participants like you to further the field of psychology.

Background and Purpose of the Study:

This study tests the relevance of Dual Process Theory to forgiveness. Dual-process theory puts forth that the human mind operates using two systems: one which operates quickly, effortlessly, and largely outside one's awareness, and a second which operates slowly at the conscious level using rules such as logic. Dual-process models are now common throughout cognitive and social psychology, but have been slow to enter the clinical field. The main hypothesis of the current research is that both conscious and subconscious thinking can influence forgiveness. The findings may help to guide counsellors working with people who are having troubles forgiving and may help explain such puzzles as why some people report that even after they have forgiven they occasionally still feel angry.

As you watched the slideshow, between the slides that you could consciously see, we flashed very quickly, so quickly you probably could not see them consciously, either pleasant or unpleasant photos. This will allow us to test whether subconscious processing of pleasant vs. unpleasant photos will affect the likelihood that the participant will forgive. If it does, we can conclude that a system operating outside of one's awareness plays a part in forgiveness. The computerized sorting task you performed gave us a second way of gauging the associations you built up between the pleasantness or unpleasantness of the subliminally displayed photos and the individual depicted in the slide show.

In addition, all of the participants in this study were asked to memorize a series of numbers. Half of the participants were asked to recall these numbers almost immediately, while the other half had to hold the numbers in memory until after they had answered all the questions about Patricia. Previous research has shown that when your conscious mind is occupied with trying to remember numbers, people are less likely to reason logically about a problem. We therefore will be examining whether this too affects forgiveness.

If you have any questions about this study, please feel free to contact us at any time. The principal student investigator is Alicia Rubel, a graduate student in the Department of Psychology. Alicia Rubel may be reached at arl0hd@brocku.ca. The faculty supervisor is Kathryn Belicki, in the Department of Psychology. Dr. Belicki can be reached at kbelicki@brocku.ca, 905-688-5550 (ext. 3873), office MCB306.
If you have found participation in this study emotionally distressing and this emotional distress continues several hours after completion of the study we encourage you to contact one of the Counselling resources on the sheet we have provided you.

Thank you again!
Appendix D
Certificate of Ethics Clearance

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<thead>
<tr>
<th>Brock University</th>
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<tbody>
<tr>
<td>Research Ethics Office</td>
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<tr>
<td>Tel: 905-335-5500 ext. 5033</td>
</tr>
<tr>
<td>Email: <a href="mailto:info@brocku.ca">info@brocku.ca</a></td>
</tr>
</tbody>
</table>

Certificate of Ethics Clearance for Human Participant Research

**DATE:** 12/1/2011  
**PRINCIPAL INVESTIGATOR:** BEUCK, Kathryn - Psychology  
**FILE:** 11-600 - BEUCK  
**TYPE:** Masters Thesis/Project  
**STUDENT:** Aida Rebić  
**SUPERVISOR:** Kathryn Beuck

**TITLE:** Forgiveness and Dual Process Theory

<table>
<thead>
<tr>
<th>ETHICS CLEARANCE GRANTED</th>
<th>Expiry Date: 12/31/2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Clearance:</strong> NEW</td>
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The Brock University Social Sciences Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement. Clearance granted from 12/1/2011 to 12/31/2012.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before 12/31/2012. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page at http://www.brocku.ca/research/policies-and-forms/research-forms.

In addition, throughout your research, you must report promptly to the REB:

- Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- Any adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
- New information that may adversely affect the safety of the participants or the conduct of the study;
- Any changes in your source of funding or new funding to a previously funded project.

We wish you success with your research.

Approved:

[Signature]

Jan Fitters, Chair  
Social Sciences Research Ethics Board

**Note:** Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.