Consolidating Mistakes of the Heart and Mind:

Toward a Dual Process Theory of Regret

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ABSTRACT

There are many idiosyncrasies in the emotion of regret that we do not fully comprehend and our traditional reliance on economic theories of human decision-making, which view regret as stemming from illogical and explicit decision-making processes, may be the cause. This thesis explores the development and testing of the Dual Process Theory of Regret (DPTR) which claims that individuals use both implicit 'orientation' and explicit 'justification' systems of thought to guide their daily decision-making and the differential use of these systems should be reflected in the intensity of regret felt for a poor outcome. To assess its utility in predicting variation in regret intensity the DPTR was tested in conjunction with two popular theories of regret; one focussing on the distinction between actions and inaction, and the other focussing on decision justification.

Three thousand adults were randomly selected from the New Zealand electoral roll and invited to participate in a postal survey of short and long-term life regrets. Of this initial sample 653 participants returned questionnaires with usable data, a response rate of approximately 23% which, while a relatively low response rate, was expected given the sensitive topic and provided more than enough respondents for the present analysis.

Results showed that the DPTR had greater utility in predicting trends in short and long-term regret intensity than either of the current regret theories. Results also illustrated that changes in justification strength had little effect on regret intensity and that explicit justifications only influenced regret in the long-term. In contrast results supported the conceptualisation of the implicit orientation and showed that it was a key source of influence on regret intensity in both the short and long-term.

This research concludes that the DPTR's focus on both implicit and explicit cognitive systems provides greater insight into the nature of regret than the reliance on explicit cognitive analysis alone. Implicit feelings of right and wrong are a better indicator of eventual regret than our ability to justify our decision. These results help resolve past anomalies in regret research, clarify conflicting trends in regret highlighted in the current media, and have application for understanding criminal recidivism.

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Andy Towers, August 2009

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CHAPTER 1.
DEFINING REGRET

The PC is the stupidest thing I ever heard of.

An Wang

Unless you have a firm grasp on the history of the computer you are likely wondering "Who the hell is An Wang?" During the 1970's and early 1980's *Wang Laboratories* was one of the most successful computer technology companies in the world. In direct competition with powerhouse companies such as IBM, Wang Laboratories became an innovative leader in the word processor market and was successful enough to eventually list on the American Stock Exchange. A single decision, however, ensured that An Wang will never be as recognisable today as his contemporaries such as Microsoft founder Bill Gates or Apple co-founder Steve Jobs. Despite the considerable advantage his company's dominance would have given him in the race to develop personal computers, Wang decided that they were an absurd idea and refused to explore their development. Not until IBM brought out the first successful personal computer, consigning the traditional word processor to the scrap heap, did Wang realise the extent of his error and eventually try to develop his own. However, it was too late; Wang's computer could not make sufficient headway in a market initiated and now dominated by IBM, and the fortunes of Wang Laboratories rapidly declined (Finkelstein, Whitehead, & Campbell, 2008).

Despite millennia of cognitive, social and technological evolution, one consistent thread characterises human decision-making; we really do make some terrible decisions. History is littered with examples of decisions which, in hindsight, were mistakes of the highest order: Despite protests from wise counsel, Priam chose to open the gates of Troy to the gift of a large, wooden horse; despite the offer of the patent on Alexander Graham Bell's new 'telephone', the president of the Western Union Telegraph Company decided to forgo the rights for what he considered an expensive 'electrical toy'; after sitting through a live hour-long audition, executives from Decca Records decided not to offer a record contract to a quartet of young men from Liverpool called 'The Beatles'[1]. Our seemingly unlimited ability to make decisions which, in retrospect, appear breathtakingly misguided is a trait spanning social and cultural divides, crossing gender and age barriers, and one emotion characterises each of these instances of failure: *Regret*.

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[1] For these and many more examples of historical mistakes please see Weir's (2005) *Encyclopaedia Idiotica*, Tuchman's (1984) *The March of Folly*, and Finkelstein, Whitehead, & Campbell's (2008) *Think Again*.

Shakespeare wrote about it. Sinatra sung about it. Philosophers argue about it. The sting of regret, that painful realisation of our folly, is an experience that encompasses the most monumental and mundane of life decisions, signalling one inescapable fact: We got it wrong. Regret is incredibly common (Landman, 1993; Shimanoff, 1984; Zeelenberg, van den Bos, van Dijk, & Pieters, 2002), primarily because it is vital in shaping our behaviour. We fear it because it signals failure and loss, and this experience compels us to alter future decision-making strategies (Zeelenberg, van Dijk, Manstead, & van der Pligt, 1998). Even the spectre of regret inspires caution (Janis & Mann, 1977), and fear of regret is a powerful tool for manipulating consumer behaviour (see Desmeules, 2002).

Despite our fear of regret we have a deep-seated fascination with the concept. Regret is such a fundamental thread in the fabric of our society that we even showcase our regrets and the lengths to which we try to undo them on national television (see Zeelenberg, van der Pligt, & Manstead, 1998). Expressing regret is a public acknowledgement of our wrongdoing (see Leech, 1983) and we now expect public figures whose decisions raise social ire to express some form of regret; for example, former Enron Executive David Delainey expressed regret for his role in the Enron scandal ("Ex-Enron exec expresses regret", 2006); former US president George. W. Bush expressed regret for his statements on the Iraq war (Mooney, 2008); Reverend Jesse Jackson expressed regret for his remarks about the (then) Democratic Presidential nominee Barack Obama ("Jesse Jackson regrets Obama jibe", 2008); the Vatican expressed regret for the church's silence during the Jewish Holocaust of World War II ("The Vatican and the holocaust", 1998). Expressing regret in a court of law can lead to reduced sentences or legal reparations for crimes (see Bagaric & Amarasekara, 2001; Robbennalt, 2003) but be warned; we are such regret junkies that we can detect when apologies sound genuinely regretful or not (Lindström, 1978).

There are two pressing reasons why we need to explore the nature of regret. First, while it may be common there are still many idiosyncrasies in the expression of regret that we do not fully comprehend: What makes something truly regrettable? Why might we experience it in some situations but not others? What dictates the strength of our regret? Understanding the basis for regret will help resolve these concerns and help identify 'best-practice' decision-making pathways which we can implement in order to avoid future failure. Second, while experiencing regret may positively shape our future decision-making, an overdose can be devastating. Regret is a self-damning emotion so the more intense the

experience the worse we feel about our life (Jokisaari, 2003; Lecci, Okun, & Karoly, 1994; Lewis & Borders, 1995), and the more regrets we have in life and the greater their prominence in our thoughts the greater the likelihood of sinking into depression (Kelekçi¸ Erdemoglu, Kutluk, Yilmaz, & Savan, 2005; Lecci et al., 1994; Schwartz et al., 2002). Theories of psychosocial development identify regret as a primary barrier to contentment in older adulthood, where the presence of inconsolable regrets will result in a life marked by rumination and despair (see Torges, Stewart, & Miner-Rubino, 2005). Learning how to avoid an overdose of regret is critical to maintaining our wellbeing and identifying the pathways to regret and the factors enhancing its strength are crucial first steps in this process.

The following thesis will explore the nature of regret, detailing exactly what it is, what factors characterise the experience of regret, and why we each might feel regret for decisions that others seemingly do not. This exploration will allow a comprehensive detailing of the constituent components shared by all regrettable decisions and facilitate the development and testing of a model of regret which highlights the key factors determining regrets intensity. As a first step towards achieving these goals the remainder of this chapter reviews the current definitions of regret in order to illustrate three clear shortcomings in the literature and emphasise key goals for the following chapters.

Current Definitions of Regret

Over the last century statisticians, economists, philosophers, and psychologists have all studied the origins of, and pathways to, regret. Consequently the definition of regret differs markedly depending on which school of thought you happen to be immersed in. As Landman (1996) notes, depending upon who is defining the concept "regret is (among other things) an emotion…not an emotion…a cold calculation of payoffs…a tepid judgment…or a hot self-protective defence mechanism" (p. 91). Little wonder then that a universally accepted definition of the emotion remains an academic holy grail. This is perhaps not surprising given that regret is a surprisingly complex concept entailing much cognitive elaboration (Gilovich & Medvec, 1995a; Lazarus, 1991) and the exercising of cognitive processes such as critical analysis, critical judgment, induction, and decision-making (Landman, 1993). William James (1884) first noted the complexity of regret when he claimed regret and associated emotions such as shame and desire were not born of simple nervous system activation, but required the activation of associated cognitions

gained through life experience. Over a century later Ben-Ze'ev (2000) presented a common thesis, considering *sadness* a 'basic' emotion but regret a 'complex' emotion requiring a 'second-order intentionality' such that it "depend[s] on reference to a conception of the self and a social comparison of the present situation of the self with imagined alternatives of the self or others" (p. 110). Where basic emotions are generally just felt, the experience of complex emotions such as regret relies on the use of cognition and counterfactual evaluation (i.e., evaluation of the real or imagined outcomes for options not chosen).

Attempts to define the nature of regret extend as far back as the 17th century philosopher Spinoza who defined regret as "the desire or appetite to possess something, kept alive by the remembrance of the said thing, and at the same time constrained by the remembrance of other things which exclude the existence of it" (cited in Gordon, 1987, p. 10). This indicates that regret is an emotion born of comparison between our current state and a desired alternative state, a common notion underpinning the varied definitions of regret that exist today (see Anderson, 2003). The first formal attempt at a definition of regret in the twentieth century originated from schools of economic decision-making, which sought to integrate the role of anticipated-regret in theories of the decision-making processes. Bell (1982) defined regret as "the difference in value between the assets actually received and the highest level of assets produced by other alternatives" (p. 963). In a similar vein Loomes and Sugden (1982) talked about regret and the 'choiceless utility' of decision options (i.e., an individual's satisfaction with each option based on its assigned value). They proposed that the regret we feel "depends only on the difference between the choiceless utility of 'what is' and the choiceless utility of 'what might have been'" (p. 809). While these definitions served their purpose in economic theory, they are ultimately very restrictive for regret research in general. Such characterisations of regret reduce its applicability to areas that did not include the pair-wise options favoured in economics research (Sugden, 1985), and lack the emotional component and individual variability inherent in what is a fundamentally 'human' emotion (Gilovich & Medvec, 1995a).

In a broader perspective on regret, Landman (1987a, 1993) draws the reader's attention to the evolution of the term, indicating that it is Scandinavian in origin and analogous to *grata*, an Old Norse term meaning 'to weep'. She also suggests that modern connotations of regret are less nostalgic and more a "bitter emphasis on gaining something unpleasant" (Landman, 1996, p. 94). Landman (1987a) defines regret as "a more or less painful cognitive/affective state of feeling sorry for losses, transgressions, shortcomings, or

mistakes…an experience of felt-reason, or reasoned-emotion." While this definition is more emotive than definitions stemming from the economics literature, it still has its opponents. Connolly, Ordóñez, and Coughlan (1997) state that Landman's definition is so 'inclusive' as to make it exceptionally hard to distinguish the experience of regret from a general feeling of unhappiness over some event. Farrell (1997) states that Landman's is a very subjective definition providing a subjective account of what constitutes the objects of regret, and these objects may not necessarily be correct. A further critique of Landman's definition is that it provides only a dichotomous indicator of regret – you either experience it or you do not. This fails to take into account Oliver's (1997) claim that there are obvious differences in the level of regret experienced over a decision - from weak to strong. Landman's definition also hardly refers at all to the physical experience or behavioural impulses that people commonly associate with emotions, except to indicate that the experience is 'more or less painful'. This definition is ultimately too vague, too subjective, and too uninformative for any practical description of the essence of, and variability in, a regrettable experience.

Zeelenberg (1999b) claimed that regret is "evoked when an obtained outcome compares unfavourably with an outcome that we could have obtained had we chosen differently, and typically occurs when we perceive ourselves to be responsible for this unforeseeable outcome...[and] motivates one to think about how this event could have happened and how one could change it, or how one could have prevented its future occurrence" (p. 328). This definition clearly highlights the role that cognitive components of emotion (i.e. attribution, subjective conscious experience) play in the experience of regret. However, this definition still leaves us with little idea of whether regret is necessarily a *felt* experience (i.e., whether it has associated core affect shift, instrumental action, or physiological changes). Is this because regret has no characteristic physiological or phenomenological experience or because little research has actually explored this aspect of regret?

The most comprehensive assessment of regret to date was recently made by Zeelenberg and Pieters (2007), who illustrated the conditions under which regret should be experienced and the behaviours it promotes. It highlights key aspects of regret, such as its aversive nature, its basis in counterfactual thinking, and it distinguishes regret from other related emotions. Zeelenberg and Pieters continue a strong trend throughout the regret literature of basing their detailed analysis primarily on consumer-regret research, not in itself surprising given that consumer-research has been the backbone of our information on

the experience of regret over the past century. But this again raises questions of the value of regret theories based on consumer purchasing scenarios for describing decision-making in 'real-life' situations which entail individual preference, variability and experience and do not reflect the constraints envisaged by economists (see Gilovich & Medvec, 1995a; Sugden, 1985).

There are, therefore, key questions regarding the experience of regret that previous definitions of this emotion have not addressed. A primary question is 'how is regret distinct from mere cognition'? This is not necessarily intended as a criticism of researchers to date, but rather, emphasizes the key position cognition plays in the experience of regret and the lengths we need to go to to distinguish regret as an emotion. For instance, Gilovich and Medvec (1995a) state that regret is "an unusually cognitive-laden or cognitively-determined emotion" (p. 379), while Landman (1987a) concedes that "if regret is an emotion…it is an emotion that is largely cognitive" (p. 137). With the exception of a few notable investigations into the phenomenology of regret (see Frijda, Kuipers, & ter Schure, 1989; Roseman, Weist, & Swartz, 1994; Zeelenberg et al., 1998), the bulk of the empirical research in the area seems to have assumed that regret simply *is* an emotion, and researchers have thereafter focused attention upon the complex cognitive components that seem to underscore the experience. We consequently have little insight into whether regret is an emotion and what aspects of an emotional episode are actually evident in the experience of regret.

Reviews and assessments of the experience of regret often offer no specific reference to theories of emotions or emotion construction, which further confuses the debate around whether regret is or is not an emotion and may be a key factor in explaining the variety of disparate definitions of regret highlighted by Landman (1996). Providing a definition of an emotional state prior to defining a discrete emotion provides readers with an understanding of the paradigm within which the emotion is being defined and reduces subsequent misinterpretation of your work (Larsen & Fredrickson, 1999). Outlining a definition of 'emotion' also provides an objective structure for the exploration of discrete emotions, without which any definition of a discrete emotion may be considered relatively subjective – as was the case with Landman's (1987a) definition of regret. Outlining the constituent components expected of an emotion also facilitates further refinement of, and debate over, the resulting definition of a discrete emotion as it forms a basis from which to critique findings.

A third question not answered by previous theories of regret is, if regret is truly a 'felt' emotion, to what extent does it possess a characteristic phenomenological expression (e.g., physiological manifestations) and does this reflect a unique phenomenological footprint among other related emotions? Although investigations into the phenomenology of regret have been conducted (as noted above), previous definitions of regret have failed to incorporate this information despite it being one of the key factors highlighted in understanding the experience of any emotion (for a comprehensive list of requisite factors for emotion description see Strongman, 1996, 2003). Is this failure reflective of the fact that regret has little phenomenological footprint, and if so why has this information not in itself been deemed a characteristic component of the experience of regret? The phenomenological component (or lack thereof) of regret is an essential component of a definition of that emotion as it provides vital information with which to distinguish it from other emotions and from the operation of simple cognition.

Lastly, current theories of regret tend to illustrate what makes a decision regrettable or not and there is little or no mention at all of the factors that may enhance or ameliorate regret intensity. Dictating the constituent components of a regrettable decision is only half the job of describing an emotion; we need to understand the factors underpinning its strength in order to understand the variability evident in its expression. A key task for the present thesis is to explore the factors that enhance or ameliorate the intensity of our regret and how they might operate in conjunction with one another.

Pathway to a Solution

What is currently lacking in the area of regret research is a definition of emotion that illustrates the multiple components of regret that define it as an emotional episode, and a comprehensive analysis of the factors that dictate the intensity of our regrets. This thesis will attempt to realise this goal by taking a structured approach as follows:

(1)   I will highlight the 10 components common to most emotions, review the regret literature for evidence of the experience of each component, then construct a definition of regret which will highlight the role of each emotional component in the experience of regret.

(2)   I will then review the literature on regret for evidence of the factors determining regret *strength* or *intensity*, highlight the shortcomings of this evidence in relation to 'real-life' regrets, and propose a new exploration of regret intensity based on the processes inherent in 'real-life' decision-making.

(3)   I will outline a new theory of regret intensity, detailing the two factors which determine regret intensity in real-life decision-making situations, and illustrate the mechanisms underpinning these factors and how they operate in combination to influence regret intensity.

(4)   I will then empirically test this theory on the 'real-life' regrets of community dwelling citizens of all ages to identify its strengths and weaknesses in explaining variation in the intensity of life regrets.

CHAPTER 2.
THE COMPONENTS OF REGRET

When someone tells you something defies description, you can be pretty sure he's going to have a go at it anyway.

Anonymous

Aside from its considerable cognitive component, it is not obvious what constitutes the emotional state of regret, or, whether regret can even be characterized as an emotion under common definitions of an emotional state. This chapter will provide an overview of the components of an emotional state and highlight the key components which are present in the experience of regret. This will facilitate three key goals which are (1) to show how regret qualifies as an emotion and not simply a cognition, (2) to illustrate exactly what the necessary boundary conditions are for the onset of regret, and (3) to develop a definition which illustrates both the cognitive and phenomenological aspects of regret.

What are the Characteristic Components of Regret?

As previously mentioned, defining the constituent components of an emotion prior to exploring the experience of discrete emotions serves three specific ends: (1) it structures your research approach, (2) it reduces potential misinterpretation of your work, and (3) it provides an objective framework from which others can critique your work. Discrete emotions are characterised by the profile of their similarities and differences with other emotions, comparisons one can only make with reference to a common definition of an emotional state. Trying to define the essential qualities of a discrete emotion in the absence of such a common definition of an emotional state is somewhat like to trying to explain colours to a blind person! In order to provide an adequate definition of the emotional components which constitute the experience of regret, I first need to outline the components that typify an emotional episode in general.

A Definition of Emotion

Psychology has seen the rise and fall of some seminal theories of emotion; emotion as simple nervous system hard wiring, emotion as born from behaviour, emotion as experienced concurrent to behaviour, and emotion as simply behaviour at high or low

energy levels to name but a few examples (for a comprehensive analysis of psychological theories of emotions see Strongman, 1996, 2003). This reflects the disagreement in the literature on the very *nature* of human emotions, and explains the variation in the numbers of basic, or universal, emotions hypothesized to exist. For instance, Mowrer (1960) claimed that there are only two basic emotions – pleasure and pain - while Frijda (1986) claims almost 20.

Based on a comprehensive review of the literature on emotion construction, Russell (2003) stated that there are 10 components commonly involved in the experience of an emotion, or what he terms an 'emotional episode' (see Table 1). Russell stresses that these components are not to be interpreted in the manner of a classical categorization theory (i.e., as either defining properties or manifestations of an emotion). Rather, they represent components in a prototypic model of emotion, where the experience of a specific emotion does not entail the activation of *all* components but merely requires activation of enough constituent components that, when viewed together, may resemble ones prototypic example of a specific emotion. These components broadly indicate that emotions are psycho-physiological reactions attributed to a specific triggering event, marked by a particular valence, and appraised as personally relevant. The next section considers which of these 10 components are characteristic of the experience of regret.

The Components of a Regrettable Episode

1. Antecedent Event or Object

The antecedent event in the case of regret is a decision-making situation (Festinger, 1964; Janis & Mann, 1977; Zeelenberg & Pieters, 2004) and the antecedent object of regret is the *realised* outcome which compares poorly with other real or possible (i.e., counterfactual) outcomes (see Gilovich & Medvec, 1995b; Zeelenberg, 1999b). Selecting one option from an array means that the outcomes of the alternative options are immediately lost to that individual, and in order to judge the worth of our resulting outcome we use the outcomes of the foregone options as the standard for comparison.

Table 1

Russell's (2003) Components of an Emotional Episode

Component

1. Antecedent Event or Object
   An obvious, external event which precedes an emotional episode

2. Affective Quality
   The perceived valence of an antecedent event or object (e.g., positive or negative)

3. Core Affect
   The basic experience of pleasure/displeasure or activation/deactivation

4. Attribution
   The attribution of core affect change to the antecedent event

5. Appraisal
   An assessment of the antecedent event involving it's future possibilities for us, it's relevance to our own goals…etc

6. Instrumental Action
   A behavioural reaction in direct response to the antecedent event (e.g., approach or avoidance)

7. Physiological and Expressive Changes
   Changes in physiology and/or facial expression, actually promoted by core affect change and instrumental action readiness, are attributed to the antecedent event

8. Subjective Conscious Experiences
   The metacognitive judgments that occur in relation to physiological change and in response to the antecedent event (i.e., judgments of responsibility, control, urgency, indecision…etc)

9. Emotional Meta-Experience
   The experience, through categorical analysis of the preceding features, of a specific emotion (i.e., recognition of fear, or happiness)

10. Emotion Regulation
    The actions we take, mediated by our understanding of the emotional meta-experience, to manage the features of an emotional experience (e.g., core affect, physiological reactions)

2. Affective Quality

Regret will only blossom when the realised outcome is judged *more negatively* than foregone outcomes (i.e., there is an *upward* counterfactual comparison). Upward counterfactuals are an essential component of regret as they indicate that we could have achieved a better outcome had we chosen differently (see van Dijk & Zeelenberg, 2005). In line with Spinoza's original claim most definitions of regret refer to a positive upward

counterfactual comparison either specifically (e.g., Anderson, 2003), or indirectly in such terms as a perceived loss, shortcoming, or mistake (e.g., Hattiangadai, Medvec, & Gilovich, 1995; Landman, 1987a), an unfavorable comparison (e.g., Sugden, 1985; Zeelenberg, 1999a), or unfulfilled goals (e.g., Lecci et al., 1994; Stewart & Vandewater, 1999). In the face of a negative outcome but no upward counterfactual comparison we have little room for anything other than disappointment (see Camille et al., 2004).

3. Core Affect

Revealing the core affect associated with regret (i.e., the basic experience of pleasure/displeasure or nervous system activation/deactivation) involves an assessment of the phenomenological experience resulting from the realisation that you made the wrong decision. How does it make you feel? Regret must necessarily feel negative or unpleasant as most people try to avoid the experience, and the characterization of regret in previous research and current empirical evidence supports this view. Firstly, in economics theory regret represents the likely affect resulting from a bad choice, as evidenced by Ackert, Church, and Deaves (2003) who state that "an investor may regret a bad investment decision but is not likely to regret a good one" (p. 38). Regret is also employed as a direct contrast to positive emotions in decision analysis; for example, satisfaction (Tsiros & Mittal, 2000), relief (Walchli & Landman, 2003), and feeling 'better' (Landman, 1987b). Secondly, in taxonomic assessments of emotion terms, regret is consistently linked with negative emotions such as shame, guilt, remorse, embarrassment, doubt, and worry (Diener, Smith, & Fujita, 1995; Lee, 2003; Shaver, Schwartz, Kirson, & O'Connor, 1987; Shaver, Wu, & Schwartz, 1992; Smits, de Boeck, Kuppens, & van Mechelen, 2002; Storm & Storm, 1987). Studies involving real-life regrets also show that people appraise regret as an unpleasant emotion (Frijda et al., 1989; Roseman, Spindel, & Jose, 1990). The juxtaposition of regret with positive emotions, and the direct association of regret with negative emotions, implies that regret is a negative affective state.

While regret is definitely *perceived* negatively, there seems to be no accompanying physiological arousal specific to its experience. Russell and Mehrabian (1977; Study 2) asked people to rate certain emotions on the levels of pleasure and arousal they inspire, and they found that regret was rated as markedly unpleasant but had no obvious arousal. This is not surprising given that regret is a subset of sadness (Shaver et al., 1987), and sadness is an emotion that shows very little physiological reactivity anyway (Lazarus, 1991). Despite the

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lack of perceptible physiological arousal recent neuropsychological research reveals that the experience of regret does involve some form of nervous-system activation. Contrasting the gambling performance of healthy people with patients who have lesions to their orbitofrontoal cortex (an area of the brain involved in mental comparison and reward analysis; see O'Doherty, Kringelbach, Rolls, Hornak, & Andrews, 2001), Camille et al. (2004) found that both groups experienced feelings of disappointment at a loss, but only the 'normal' people expressed regret when positive counterfactuals were revealed. Coricelli et al. (2005) confirmed the results of Camille et al. (2004), showing the neural activity associated specifically with regret occurred in the medial orbitofrontal region, the anterior cingulate cortex, and the hippocampus. This indicates that the neural activation associated with regret is distinct from that associated with the closely related emotion of disappointment. While this is a valuable finding in itself, in the face of historical assumption that regret has no specific arousal components, it indicates that some form of emotion-specific nervous system activation does exist for the experience of regret but it seems to occur below the level of conscious experience.

4. Attribution

Displeasure over a decision should only be called regret if we can attribute this feeling to the loss of a positive foregone outcome. Janis and Mann (1977) found that knowledge of relative losses was central to the development of regret, and Roseman et al. (1990) found that regret was characterized by the contention that individuals felt they *deserved* a positive outcome. This suggests that the loss of a positive outcome is crucial to the onset of regret, but even more crucial is the associated knowledge that this outcome was lost through as a result of our own behaviour. For instance, Roese and Summerville (2005) showed that the greatest life regrets occurred in life domains where ongoing opportunities to attain a better outcome where possible but we had still not attained them (e.g., self-improvement, further education), rather than life domains where the opportunity of attaining a better outcome had passed (e.g., financial and career opportunities). This supports the notion that regret is attributed to the knowledge that a better outcome was lost through one's own failure.

5. Appraisal

Appraisal involves clarifying whether the event affects us personally, how this event or object may improve or impinge on our goals, and how it may influence our future decisions. One of the more salient aspects of a regrettable decision is the understanding that negative consequences will immediately follow the decision (Janis & Mann, 1977). Any decision can result in negative consequences (e.g., a lack of money, a family member's sorrow, having to run naked down a street), but it is regrettable only when we appraise the decision as (1) involving something of personal relevance, and (2) impacting on our life goals.

Firstly, Landman (1993) claims that a negative event must be judged as personally relevant before one can truly regret it, and this idea seems well supported by empirical data. Frijda et al. (1989) found that people's experiences of regret always involved something of personal importance, and both Berndsen, van der Pligt, Doosje, and Manstead (2004) and Mandel (2003) found regret occurred in instances appraised as relating to *intrapersonal* harm or concern (where the negative consequence of the decision concerned the self). This suggests regret stems from decisions appraised as personally relevant because they have potentially negative implications for oneself.

Second, regrets are directly linked to our goals (e.g., getting rich, having a hairless back), so much so that a number of studies have actually quantified the term *regret* as an unfulfilled life goal (e.g., Jokisaari, 2004; Lecci et al., 1994). Many of our life goals dwell on core areas such as educational opportunities, career choices, and family-relevant decisions (Nurmi, 1992; Nurmi, Poole, & Kalakowski, 1994), so it is not surprising to learn that the bulk of our most poignant life regrets also encompass these areas (see Gilovich & Medvec, 1994; Lecci et al., 1994; Wrosch & Heckhausen, 2002). Most instances of decision-making may be regarded as circumstances for promoting personal goals or motivations and, as such, each decision carries with it some form of personal concern and a desire for an outcome consistent with our goal intentions. If we decide poorly, therefore thwarting our intended goals, then we are likely to experience regret about that decision.

6. Instrumental Action

The term *instrumental action* refers to rudimentary behaviours or actions that occur as a direct result of the antecedent event; at a basic level one might think of either approach or avoidance, or in more familiar terms, 'fight-or-flight'. The term may be likened to Frijda's (1986, 1987) *action readiness* which refers to a propensity for elementary action in response to recognized emotional states (e.g., avoiding an object of fear or approaching an

object of lust). Specific emotions give rise to basic actions that are instrumental in the initial management of the object in a manner appropriate to the nature of that episode, such as recoiling from a snake rather than hugging it.

Russell (2003) admits that he does not expect to find any specific instrumental actions in emotions like sadness, and because regret is a subset of the sadness category it is unlikely regret will possess any specific instrumental actions. Research on the potential action readiness properties of regret confirms this. Reviewing participant's descriptions of regrettable decisions, Frijda et al. (1989) found that other than a desire for the situation not to exist, participants indicated that the experience was not company to any obvious instrumental action whatsoever. Although further research has found specific *action tendencies* and *emotivational goals* associated with regret (e.g., Roseman et al., 1994; Zeelenberg et al., 1998), these terms and the manner in which they have been quantified seem to refer to *goal oriented* actions (rather than rudimentary impulses) that are enacted after some higher cognitive evaluation in an effort to regulate the feeling of regret. In this respect, they appear later in this chapter as part of the *emotion regulation* component. In line with Russell's (2003) expectation for sadness-related emotions, no specific instrumental actions seem to exist for the emotion of regret.

7. *Physiological and Expressive Changes*

Many emotions can be linked to specific physiological and expressive changes, such as the feeling of nausea, raising of the upper lip and nose wrinkling associated with disgust (Rozin & Fallon, 1987; Rozin, Lowery, & Ebert, 1994). However, other than previously mentioned neuropsychological investigations, the physiological and expressive landscape of regret has received no obvious attention in past research. This may be due to a conviction that, as a subset of a *sadness* category that has low physiological reactivity (see Lazarus, 1991), regret should show correspondingly little physiological or expressive symptoms. Another factor potentially hindering such research is that the ability to investigate physiological distinctions between higher-order emotions such as regret is hampered by mixed findings from studies investigating the distinction between even basic emotions (Frijda, 2000).

While there are no specific data available to judge regret's physical manifestations this has not stopped speculation. Janis and Mann (1977) state that episodes of intense regret are usually accompanied by "sleeplessness, psychosomatic complaints" (p. 311), but they provide no evidence to substantiate this claim. Rorty (1980) refers to "a particular sort

of painful feeling, a pang, a stab, waves of stabs" (p. 496) and "that hangdog posture, [and] vacant sadness of the eyes that are the marks of regret" (p. 497). Whether this painful feeling may best be described as a psychosomatic reaction or an organic physiological response remains unclear. Lazarus (1991) states that no universally verifiable pattern of facial expression actually exists for regret-related emotions such as shame and guilt, so while Rorty (1980) may claim specific expressions are evident in regret, given the lack of empirical evidence for such expressions in regret-related emotions, we should assume no regret-specific expressions exist.

8. Subjective Conscious Experiences

Russell (2003) states that emotional episodes commonly involve highly complex cognitive process - metacognitive judgments - which are evaluations that occur in response to change in the other components of an emotional episode (e.g., antecedent objects, core affect change, appraisal processes). Metacognitive judgements are essentially episode-specific concerns which help to define the role we may have played in its inception (e.g., assessments of urgency, personal responsibility for the event, level of control over the event).

Metacognition 1: Responsibility.   A metacognitive judgment central to regret, and the topic of recent debate, is the role of personal responsibility; namely, is it a necessary element for regret to occur? Some have previously claimed that, while it is a common characteristic of regret, personal responsibility for the decision or event is not a *defining* feature of the emotion and one could regret events that are beyond ones responsibility or control (e.g., Ben-Zeev, 2000; Landman, 1993; Simonson, 1992; Solomon, 1983). Their argument is that you can regret events or occurrences over which you have no direct control – as long as you actually *care* about the outcome or have some emotional investment in it. In this respect, it is possible to voice regret for the actions of your nation's government and military (e.g., the invasion of another country) when the responsibility for making such decisions was never yours. In contrast, others believe that responsibility is a *necessary* precursor to regret, and that without a sense of personal causality for the event in question one cannot be said to actually experience regret (e.g., Gilovich & Medvec, 1994; Oliver, 1997; Roseman, 1984; Sabini & Silver, 2005; Zeelenberg et al., 1998; Zeelenberg, van Dijk, Manstead, & van der Pligt, 1998; Zeelenberg, van den Bos, van Dijk, & Pieters, 2002).

They feel that responsibility for the decision or event is a prerequisite to the development of regret "because one could have prevented the occurrence of the negative outcome by choosing something different" (Zeelenberg et al., 2002, p. 315).

Empirical research over the past two decades appears to support the notion that regret in the absence of responsibility is an extremely *rare* event, and that in general responsibility *is* a precursor for regret. First, decision-making experiments show that regret is positively linked to levels of responsibility, such that the more responsible an individual is made for the occurrence of a negative event the greater their regret is judged to be (see van Dijk, van der Pligt, & Zeelenberg, 1999; Zeelenberg, van der Pligt, & de Vries, 2000; Zeelenberg, van Dijk, & Manstead, 1998, 2000). This does not exclude the possibility of regrets without responsibility, but it provides a strong indication that people associate greater responsibility for negative events with greater regret. Secondly, studies of real-life regrets reveal an overwhelming number of regrettable situations in which the individual feels directly responsible for the decision and extremely few in which the individual lacks responsibility (see Gilovich & Medvec, 1994). Thirdly, studies asking participants to evaluate the *nature* of their life regrets show an active belief that regrets stem from self-caused events or events for which they are directly responsible (Frijda et al., 1989; Mandel, 2003; Roseman, 1991; Roseman, Antoniou, & Jose, 1996; Van Dijk & Zeelenberg, 2005).

As a potential resolution to this debate I argue that responsibility *is* a necessary precursor to regret, but that responsibility can also encompass social group ties such that regret can be felt for the behaviour of someone that forms part of a social group of which you are a member. This assertion can be linked to Landman's (1993) notion of personal concern as a regret precursor, but in this view the personal concern arises out of a shared group bond. We are all members of social groups (families, friendship networks, communities) sharing similar values, customs and beliefs, and the behaviour of group members might necessarily be seen to reflect the values and beliefs of the group as a whole. When a member of a social group makes a regrettable decision which has potentially wider social ramifications (e.g., killing someone), so the members of the group will share the responsibility *to some degree*. This broadened notion of responsibility explains media accounts of individuals expressing regret for family members' violent actions, or for the destructive actions of their nation's government as these claimants are invoking social ties to the greater national group. Saying 'I regret the actions of our

government' is tantamount to stating 'As a citizen of this country, I regret the actions of my fellow countrymen'.

Metacognition 2: Emotion specificity.　　　　　One of the key roles of the metacognitive judgment in the experience of regret is helping distinguish between regret and other, highly related, emotions. Regret is not experienced in an affective vacuum but coincides with the experience of other negative emotions, such as guilt or shame (Mandel, 2003; Zeelenberg, van Dijk, van der Pligt, Manstead, van Empelen, & Reinderman, 1998). Regret can however be distinguished from these emotions with respect to specific metacognitive judgments concerning the nature of the decision and its ramifications.

Regret versus guilt. Regret can be distinguished from guilt on two key points. First, one can only feel guilty for events that entail moral or legal transgressions, while regret occurs for events both within and beyond the bounds of legality and morality. Borrowing an example from Landman (1987a), if you learned your friends successfully robbed a bank you wouldn't feel guilty about not helping them but you may regret not helping them as you would have been able to partake of the loot. As Landman states "one can regret *not* having done something immoral but one does not feel guilty for that" (p. 151). The second, related, point is that the concern for guilt is violation of social norms while regret concerns events or decisions which are harmful, (Ben-Ze'ev, 2000), and Zeelenberg and Breugelmans (2008) showed that this harm could be either inter- or intra-personal harm. Regret thus differs from guilt in that it is an emotion of simple pragmatism; our outcome is worse than another irrespective of who is wronged.

Regret versus shame. Three key points differentiate the experience of regret from that of shame. First, shame involves an obsessive review of the *specific* moment of exposure (e.g., the moment you wet your pants) while the focus of regret tends to be on its long-range consequences (Rorty, 1980). Second, regret is a *self-directed* reaction where the pain is one of self-analysis, whereas shame is *publicly* focussed as it is a direct reaction to public recognition of wrongdoing: "the pain the person feels at the action is that of having been seen to perform it, or being recognized as the sort of person who would perform it" (Rorty, 1980, p. 498). Third, regret is produced by the thwarting of goal-attainment (i.e., when we fail to gain the best or preferred outcome) whereas shame is produced by damage to our *self-esteem* (Ben-Ze'ev, 2000). Regret thus differs from shame because it

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represents a self-indulgent emotion; the concern is primarily for the self, the thwarting of our goals and the future repercussions we will have to endure.

Regret versus remorse. Though the terms are often used interchangeably, two factors distinguish regret from remorse. First, reflecting the distinction made between guilt and regret, remorse is only felt for moral transgressions (Taylor, 1996), but we have already established that regret is not similarly morality-bound. Second, though one of the primary functions of regret is to prompt behavioural change, the experience of regret does not *necessarily* preclude someone from committing the same act in the future whereas remorse is characterised by a determination *never* to commit the same act in future (Landman, 1987a). There are cases – most likely non-moral decisions – which will prompt regret but the regret may not necessarily prohibit the same decision being made in future as, despite the poor outcome, the decision may still have been the 'right' one to make at the time. For instance, a policeman may express regret at having to tell someone their loved one has died because of the grief that their information caused, but they accept that they were duty bound to act as they did and may have to commit the same act in the future. Likewise, a company director may regret having to fire staff during an economic recession but this would not preclude future lay-offs. In contrast, remorse for an action in no way implies acceptance of the act and the possibility of making the same decision again in future; as Taylor (1985) states, "it is impossible to feel remorse and yet believe that overall it was right to act as one did" (p. 99). Regret is thus distinct from remorse because its boundaries are blurred by self-interest; while it marks an unfortunate outcome the same decision may be repeated in future if it suits our purpose.

Regret versus disappointment. Two points help distinguish the experience of regret from disappointment. First, disappointment is tied to a disconfirmed expectancy (i.e., the outcome is worse than expected) which could be due to simple bad luck, while regret is tied to the existence of an upward counterfactual (i.e., the outcome appears poorer in comparison to another) which implies a poor decision process (Zeelenberg et al., 1998). Second, regret is associated with greater levels of responsibility and self-agency for the poor outcome than disappointment (Frijda, et al., 1989; Zeelenberg et al., 1998). Regret therefore differs from disappointment because it is an emotion entailing agency; our outcome pales in comparison to another as a consequence of our own poor decision-making.

A summary of metacognitive judgements. Aside from three factors already shown to be central to the experience of regret in previous sections (namely upward counterfactual alternatives, goal-attainment concerns, and negative consequences for the self) there are five metacognitive judgements which define the experience of regret and distinguish it from related emotions. Specifically, we judge whether the outcome:

1. Involves personal responsibility

2. Covers either moral or non-moral concerns

3. Results in some form of harm to either self or others

4. Involves self-analysis or concern over public scrutiny

5. Signals against future repetition of the decision

9. Emotional Meta-Experience

The emotional meta-experience involves the recognition that one is experiencing a prototypic emotion, which itself reflects the specific characteristics of the preceding emotional components (e.g., specific core affect, appraisals, and subjective conscious experience). In other words, people are seen to experience anger when the pattern of emotional components resembles their subjective prototype of the emotion label *anger*. The idea that we recognize various emotions via evaluation of subjective experience is reflective of some of the oldest theories of emotions (e.g., James, 1884), but Russell (2003) admits that empirical evidence for the existence of his emotional meta-experience is still scarce. While studies have explored anticipated or post-hoc assessments of regret no research focusing on point-in-time evaluation of a regrettable episode seems to exist and, as such, confirmation of a regret-specific meta-experience is not possible.

10. Emotion Regulation

The onset of a specific emotion (e.g., fear) often prompts us to regulate or control its expression or ramifications (e.g., force ourselves not to scream) in order to lessen the intensity or impact of the emotion. Emotion regulation in regret might therefore involve attempts either at rendering the emotional episode more palatable, or, changing the circumstances in order to redress the negative outcome. Research on emotions show they can be characterized by specific *action tendencies* (Arnold, 1960) and *emotivational goals*

(Roseman, 1984) which can be categorized as reasoned responses to an emotional situation which reflect a motivation to change the current state of the world in a desirable direction. In contrast to *instrumental actions*, which are best characterized as impulses, such as fight-or-flight, action tendencies and emotivational goals therefore reflect *emotion regulation* processes as they represent a deliberate attempt to remedy the situation for ones own good.

Specific regret-related action tendencies and emotivational goals have been illustrated in previous research, such as a desire to kick oneself and to correct the mistake, and a desire to get a second chance, improve performance, and 'undo' the event (Roseman et al., 1994; Zeelenberg et al., 1998). Other than the desire to kick one self, these actions are aimed at changing the immediate situation in order to reduce the impact of our poor decision. A further medium through which we attempt to regulate the intensity or impact of regret is the common, garden-variety, apology (Deutschmann, 2003; Zeelenberg et al., 1998). Apologies are a public acknowledgement of our wrongdoing and are made in an effort to gain pardon, which in turn restores us to an emotional equilibrium (Leech, 1983). While apologies help remedy the immediate fallout of our poor decisions, there are action tendencies and emotivational goals associated with regret which also target our future decision-making strategies. The experience of regret prompts (but does not impel) changes to our future decision-making, such that when the potential for regret is salient (i.e., a high risk of failure exists) people become highly risk averse (see Simonson, 1992; Tykocinski & Pittman, 2001). This is especially so when we have had prior experience of regret involving a similar decision (see Inman & Zeelenberg, 2002).

Toward a Formal Definition of Regret

A review of the literature confirms that the experience of regret has a specific emotional 'footprint' such that it can be clearly defined using Russell's (2003) 10 components of an emotional episode (see Figure 1 below). This provides for the perfect information on which to base a definition of the experience of regret. First, regret is an unpleasant emotion experienced when the outcome of a personally relevant decision compares poorly to the outcome of an option not chosen. This decision induces regret because the poor outcome reflects the loss of a desired state or goal and entails negative personal consequences as a result. Regret can be characterised by specific patterns of neurological activation, but does

not prompt any conscious impulses, physiological or otherwise. The experience of regret requires a number of fundamental judgments which differentiate it from the experience of other emotions.

Emotion components	→	Emotion label

Antecedent event
A decision-making situation.

Affective quality of antecedent event
The decision outcome compares negatively to another real or imagined outcome.

Core affect
The situation is unpleasant but results in no recognisable nervous system activation.

Attribution
A better outcome was possible but was lost through our own action or inaction.

Appraisal
The decision was personally relevant and goal related. The outcome entails negative personal consequences.

Subjective conscious experience
The decision involved:
1. Personal responsibility
2. Moral or non-moral transgressions
3. Results in harm for self or others
4. Self rather than public assessment
5. Warning against (but not prohibiting) the same decision in future.

Emotion regulation
The outcome prompts:
1. Self-condemnation
2. Desire to undo or correct the wrong
3. Future risk aversion

Emotional components lacking
1. Instrumental action
2. Physiological & expressive changes
3. Emotional meta-experience

Regret

Figure 1. A model depicting the components of a regrettable episode.

Principally, regret involves personal responsibility for the decision, can involve but not be restricted to moral transgressions, results in harm to the self or others, involves failure to live up to self-standards rather than public-standards, and signals that a poor outcome has occurred but does not prohibit the same decision being made in future. Regret prompts feelings of self-condemnation, a desire to undo the wrong and to remedy the situation. While evidence of a meta-experience in *any* emotion – let alone regret – is still debateable,

regret can also be characterised by its lack characteristic instrumental actions, conscious physiological changes, and characteristic expressions. The lack of these components is therefore just as important for identifying regret as the presence of them might be for defining other emotions such as anger.

Summary and Steps Forward

The experience of regret possesses characteristic phenomenological components and can also be characterised by the absence of key physiological and expressive characteristics evident in other emotions (e.g., anger, disgust). The lack of physiological and expressive components is likely the reason that current definitions or regret place such a significant weighting on the cognitive components essential to experience regret, because few non-cognitive aspects help both to define the emotion and to differentiate it from related negative emotions. Having provided a comprehensive definition of regret, the next key step is to understand what factors help to intensify or quell our feelings of regret over a decision, and how do they differ between individuals making the same decision.

CHAPTER 3.
VARYING THE SHADE OF REGRET

After the maximum shocks had been delivered, and the experimenter called a halt to the proceedings, many obedient subjects heaved sighs of relief, mopped their brows, rubbed their fingers over their eyes, or nervously fumbled cigarettes. Some shook their heads, apparently in regret. Some subjects had remained calm throughout the experiment, and displayed only minimal signs of tension from beginning to end.

Stanley Milgram

When Milgram (1963) conducted his famous studies of obedience few people realise that he inadvertently made an interesting observation on the nature of regret. As noted above, he found that despite making the same decisions and experiencing exactly the same outcome participants expressed vastly different levels of regret. This observation reflects a simple truth; some people will feel profound regret for behaviour that others seemingly express little regret for performing. Individual variation in the expression of regret still challenges researchers for an explanation and it is this variation to which this thesis now turns its attention. In this chapter I will focus on exploring what determines the intensity of our regret and how individual differences in the intensity of our regret arise (see Figure 2 below). I will (1) outline some of the variables currently thought to influence regret levels in economics-based research, (2) discuss their applicability to real-life regrets, (3) highlight the gulf between axioms of rational choice and real-file decision-making experiences, (4) detail the nature of dual-process models of decision-making, and lastly (5) propose a dual process theory of regret which incorporates both intuitive and analytical decision-making strategies in order to more adequately explain the decision processes dictating regrets intensity.

Contextual Influences on the Shade of our Regret

The literature on regret and its impact on economic and consumer decision-making is vast and highlights a number of factors associated with the development of consumer regret. In the next few passages I will present some of these factors and explain how they vary regrets intensity.

Counterfactual 'Nearness'

While an upward counterfactual evaluation is *essential* for the experience of regret (as noted in the previous chapter), the 'nearness' to reality of a counterfactual may also influence regret intensity. For example, imagining catching a plane for someone who just missed it by two minutes is a 'near' counterfactual, whereas it is a 'distant' counterfactual for the person that missed it by three hours.

Emotion components		**Emotion label**	**Level of regret**

Antecedent event
A decision-making situation.

Affective quality of antecedent event
The decision outcome compares negatively to another real or imagined outcome.

Core affect
The situation is unpleasant but results in no recognisable nervous system activation.

Attribution
A better outcome was possible but was lost through our own action or inaction.

Appraisal
The decision was personally relevant and goal related. The outcome entails negative personal consequences.

Subjective conscious experience
The decision involved:
1. Personal responsibility
2. Moral or non-moral transgressions
3. Results in harm for self or others
4. Self rather than public assessment
5. Warning against (but not prohibiting) the same decision in future.

Emotion regulation
The outcome prompts:
1. Self-condemnation
2. Desire to undo or correct the wrong
3. Future risk aversion

Emotional components lacking
1. Instrumental action
2. Physiological & expressive changes
3. Emotional meta-experience

Regret

Highest

Lowest

Figure 2. The components of a regrettable episode and subsequent range of affect.

'Near' counterfactuals differ from 'distant' counterfactuals as they are considered outcomes that *almost* or even *should* have happened had we made just a small change to our behaviour (Kahneman & Miller, 1986; Kahneman & Varey, 1990; Teigen, 1998). Regret is greater for outcomes with near counterfactual alternatives because 'nearness' increases perceptions that it was easily attainable with little extra effort which, in turn, highlights that our choice was central to its loss (Heider, 1958). Sevdalis and Kokkinaki (2006) found that participants generating 'near' counterfactuals to a poor decision expressed greater regret than those generating 'distant' counterfactuals, and Li and Liang (2007) showed that the closer one comes to attaining a desired outcome the greater the subsequent regret intensity at missing out on it.

Decision Difficulty

Difficult decisions are those where options are *equally desirable* (Luce, 1998; Sugden, 1985), or, where information regarding one's options is mostly *unknown* (Oliver, 1997), or, where there are *no common features* between choices (Dhar & Nowlis, 1999). Whichever of the above situations you face it is quite likely that you will also experience regret over your final decision because, the harder the choice, the more regret you will likely feel about getting it wrong. Chatterjee and Heath (1996) showed that perceived decision difficulty is highly associated with regret intensity ratings, while Park, Jun, and MacInnes (2000) showed that feelings of anticipated regret increase when decision difficulty was enhanced. This occurs because, when the outcome is poor, we realise that the unselected option (e.g., the other car) was *potentially* as good as the chosen option and was well within our ability to attain. On the other hand, easy decisions (i.e., where a leading option is obvious) are in some sense faultless when the outcome is poor, as a review of your decision reveals that you still chose the best option.

Status Quo Options

Selecting the 'status quo' means selecting the same option as previously taken, or, the normatively appropriate option - this ensures an outcome that is known, comfortable, and requires little cognitive effort to attain (see Inman & Zeelenberg, 2002; Kahneman, Knetsch, & Thaler, 1991; Luce, 1998; Simonson, 1992). A status quo option acquires default status through repeated use, making its selection increasingly subjectively justifiable and, therefore, reducing the likelihood of post-decision regret (Simonson, 1989). Research on

financial and consumer decisions shows that regret over a poor outcome is greater for those whose decision was to switch from, rather than stay with, the status quo option (e.g., Kahneman & Tversky, 1982a; Samuelson & Zeckhauser, 1988; Tsiros & Mittal, 2000). This is because switching from the status quo option requires both 'agency' and intent to change, and in the face of a poor outcome this will likely appear the primary cause of the poor outcome (Baron & Ritov, 1994; Tsiros & Mittal, 2000). However, the wisdom of selecting status quo options can be questionable; if we have a *negative* prior experience with a status quo option then we have both the grounds and the ability to switch our choice, so staying with the status quo in this situation heightens regret as it represents an abnormal behaviour (Anderson, 2003; Inman & Zeelenberg, 2002; Ratner & Herbst, 2005).

Reversibility of the Outcome

Poor outcomes compel us to look for a way to remedy the situation, and attempts to reverse the poor decision are a primary post-decision tendency (Pieters & Zeelenberg, 2007; Roese, Summerville, & Fessel, 2007; Zeelenberg & Pieters, 2007). We all have a preference for reversible decisions, such as the ability to return faulty products, because this remedies the poor outcome and saves us from experiencing the ongoing regret associated with it. On the other hand, irreversible outcomes contain no 'out-clause' and ensure that our regrettable decision cannot be undone. Hetts, Boninger, Armor, Gleicher, and Nathanson (2000) found that emphasising post-decision regret prompts us to ensure some form of reversibility is possible (e.g., insuring ourselves against potential financial losses), while Tsiros and Mittal (2000) showed that less regret is felt for poor purchases with money-back guarantees than the same purchase with a no return option.

Action vs. Inaction

We tend to find inaction less regrettable, and therefore more enticing, than action (Avni-Babad, 2003; Baron & Ritov, 1994; Spranca, Minsk, & Baron, 1991), even when the outcomes of both options are equally negative (Gleicher et al., 1990; Kahneman & Tversky, 1982a; Landman, 1987b). This trend is referred to as an *omission bias* (Ritov & Baron, 1990) and has a number of possible explanations. First, action often implies a change from the status quo and the risk of failure – or at least the risk of the unknown - so action may be considered abnormal and, therefore, regrettable (Gleicher et al., 1990; Kahneman & Miller, 1986; Kahneman & Tversky, 1982a). Second, actions are more regrettable than inactions

because they are more easily mentally 'undone' (i.e., 'I wish I hadn't done X'). An alternative to action is always obvious (i.e., inaction) whereas no unique alternative to inaction exists (i.e., the number of possible actions is infinite) so it is easier to imagine avoiding the consequences of any action (Roese, 1997). Third, actors are accorded greater personal responsibility for negative outcomes than non-acting individuals, and responsibility for negative outcomes is related to increased regret (Baron & Ritov, 2004; Zeelenberg et al., 2002). Fourth, actions may be interpreted as external manifestations of our intent and intentional actions which result in poor or harmful outcomes reflect badly on our character (Spranca et al., 1991). When the outcomes are potentially regrettable, inactions are considered the normative, readily available, and least harmful option.

Applying Economic Theories to Real-Life Regrets

The above factors are all supported by a wealth of evidence from economic decision-making research that emphasises their impact on regret, and many researchers have employed these factors as potential explanations for *real-life*[1] regret. A prime example is Gilovich and Medvec's (1994) theory of a temporal nature to life regret which demonstrates the impact of action and inaction decisions on regret across time. They argue that a temporal pattern to life regret exists such that we will feel greater regret for decisions in the short-term which involve action rather than inaction, but when looking back over the course of our lives we will feel greater regret for our inactions rather than our actions. Gilovich and Medvec's work has become a seminal exposition on the nature of regret, and has inspired a wealth of further research exploring distinctions between actions and inactions (e.g,, Roese et al., 2006; Zeelenberg et al., 2002), and differences between regret and other emotions (e.g., Berndsen, van der Pligt, Doosje, & Manstead, 2004; Zeelenberg, van Dijk et al., 2000). Gilovich and Medvec's theory has even informed research beyond life-regret, such as work on trends in counterfactual thought (e.g., Byrne & McEleney, 2000; Markman & McMullen, 2003), and temporal changes in behaviour construal (e.g., Eyal, Liberman, Trope, & Walther, 2004; Ritov, 2006).

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[1] The term *real-life* regret is used to refer to common instances of regret reported in accounts of life reviews (e.g., Gilovich & Medvec, 1994; Kinnier & Metha, 1989; Toktas, 2002), such as regrets about work, career, family issues, personal relationships, or travel etc.

Despite its following some researchers argue that Gilovich and Medvec's (1994) research provides no basis for the claim of a temporal change in regret *intensity* (e.g., Kahneman, 1995), and there are two specific grounds for their concern. First, Gilovich and Medvec's (1994) studies report frequency counts of reported regrets, which illustrate the extent to which the *frequency*, but not the intensity, of action and inaction regrets change from the short to the long-term. For example, when they asked about real-life accounts of short and long-term regrets (Study 5) they provided a frequency analysis showing that greater numbers of people feel 'more' regret for their inactions than their actions, but no direct measure of regret intensity is provided. Whether participants are referring to regret intensity or a qualitatively different concept such as degree of impact on current life goals or simple prominence in thought is not clear. This lack of clarity clouds the distinction between frequency and intensity which are two distinct and completely independent processes underlying the experience of affect (Diener, Larsen, Levine, & Emmons, 1985; Schimmack & Diener, 1997). Claims for temporal changes in regret intensity cannot be made on the basis of frequency measures as the frequency and intensity of affect do not necessarily correspond; some frequently occurring regrets may be low in intensity while some infrequent regrets may be extremely intense.

The second point of concern over Gilovich and Medvec's (1994) claim is that only two studies have actually sought to confirm that this temporal pattern to regret intensity exists for real-life regrets and they found a null result. Feldman, Miyamoto, and Loftus (1999) compared the frequency and intensity ratings of long-term action and inaction regrets and found that while inaction regrets were indeed more *frequent* than actions they were actually of equal *intensity*. Bonnefon and Zhang (2008) compared the short and the long-term intensity of action and inaction regrets and found that there was no difference in the intensity of either. There is therefore no empirical evidence to support Gilovich and Medvec's claim that long-term action and inaction regrets differ in their intensity.

This lack of empirical support raises serious questions about the worth of using the action/inaction dichotomy to explain real-life regrets, and further research shows there are more reasons to suspect that this dichotomy may not be appropriate for understanding the outcomes of real-life decision situations. First, the bulk of research on the action/inaction dichotomy and its influence on regret stems from scenario-based economics research which is based solely on within-subject assessments (N'gbala & Branscombe, 1997; Roese, 1997). Within-subject methodology provides both the outcomes and the necessary

counterfactual alternatives for actions and inactions in a manner unlike any real-life decision situation, and this has the tendency to elicit the exact effects that researchers are hoping to observe (see Hammond, Hamm, Grassia, & Pearson, 1987; Kahneman & Tversky, 1982b). The traditional finding of greater regret for action over inaction can also be nullified or even reversed when methodological changes are made in scenario-based research (e.g., Byrne & McEleney, 2000; N'gbala & Branscombe, 1997; Zeelenberg et al., 2002; Zhang, Walsh, & Bonnefon, 2005). Even within the strictly controlled parameters of economics research the effect of the action/inaction dichotomy is in no way stable or robust, and there is therefore no convincing argument for applying this dichotomy to real-life regrets.

Second, in experimental research the condition of *ceteris paribus* is always assumed, which entails that (1) all decisions have contrasted action and inaction options, (2) both the outcomes of action and inaction decisions are identically poor, and (3) no alternative factors impact on either the decision process or subsequent affect. In contrast, real-life decision-making situations likely involve a multitude of impelling factors and potential choices (Epstude & Roese, 2008), and if pair-wise options are evident they are not necessarily so clearly and easily comparable (Feldman et al., 1999). Such experimental control thus provides for poor 'ecological validity' which may give a false reading of our actual decision-making process. For example, Ebbesen and Konecni (1980) showed the sentencing decisions made by judges and parole officers in laboratory settings differ strikingly to the decisions made for *real* criminals in a *real* court room because the factors influencing their decisions in real-world contexts differed to those in the laboratory.

Third, research shows that the notion of clearly delineated and contrasting actions and inactions assumed in scenario-based research does not necessarily exist in real-life reviews. Although scenario-based experiments clearly distinguish between the behaviours entailing 'action' and 'inaction', in reality almost any regrettable behaviour could be construed as either an action *or* an inaction; for example, 'If only I had stayed sober' vs. 'If only I had not gotten drunk' (Davis, Lehman, Wortman, Cohen-Silver, & Thompson, 1995). Even if actions can clearly be distinguished from inaction exploration of alternative actions or inaction that may have prevented real-life traumatic events are found to have no bearing on the level of affect we feel for the outcome (e.g., Davis, Lehman, Wortman, Cohen-Silver, & Thompson, 1995; Dunning & Parpal, 1989).

In summary, the action/inaction dichotomy has little utility in explaining trends in real-life regrets and there are strong methodological and empirical bases to suspect that

such a distinction may not be applicable for explaining such regrets. The distinction between action and inaction is simply too simplistic and discounts important 'human' factors which will shade the outcome of any decision we make; Will this decision break the bank? Am I going to see my children again? Does this feel like the right thing to do? Has she ever slept with my brother? The review of action and inaction decisions and their potentially flawed application to real-life regrets helps raise broader concerns about factors arising from scenario-based regret research; specifically, the problem of application to research on real-life regret.

Problems of Cross Application

Regret is both a highly analytical and cognitively laden emotion (Gilovich & Medvec, 1995b) and a deeply poignant one (Landman, 1993). As Landman (1993) notes "genuine regret lodges itself in the spaces between act and character, act and judgement" (p. 116). Both analytical and more intuitive thought processes should play a role in generating the regret intensity that we feel. Our current understanding of regret has been heavily influenced by schools of economic thought, whose classical theories – for example, *Minimax Regret* (Savage 1951, 1954) and *Regret Theory* (Bell, 1982; Loomes & Sugden, 1982) - promote axioms of rational choice as appropriate grounds for decision-making; an approach Evans and Over (1996) define as 'impersonal rationality'. Such classical theories assume that regret is ultimately determined by an analytical review of the rationality of our decision-making strategy and that greater regret results from greater irrationality.

In real-life situations we often fail to select the most 'rational' option, a situation historically referred to as *akrasia* or "acting against one's better judgement" (Arpaly, 2000, p. 488). Originally, economists put this axiom-violation down to poor decision-making, but now it is the value of these economic theories for capturing the dynamic of real-world decision-making that is being called into question (e.g., Lopes, 1981; McKenzie, 2003; Miljkovic, 2005). Simon (1983) notes that axiomatic reasoning serves "as a model of the mind of God, but certainly not of the mind of man" (p. 34), while Alloy and Tabachnik (1984) claim that "if people's (or animals') judgments do not match those predicted by a normative model, this may say more about the need for revising the theory to more closely describe subjects' cognitive processes than it says about the adequacy of those processes" (p.140).

Observing the inability of classical theories to adequately predict human decision-making, Tversky and Kahneman (1986) declared that for economists "the dream of constructing a theory that is acceptable both descriptively and normatively appears unrealizable" (p. 272). This is likely because classical tests of human decision-making strip decision situations of their natural social complexity and the multitude of related cues that provide individual *meaning* (Chase, Hertwig, & Gigerenzer, 1998). Beach and Lipshitz (1993) therefore state that such theories simply "[do] not provide the conceptual depth that is needed to deal with real-world complexity" (p. 29), and this lack of 'realism' is why many laboratory studies do not generalise well to real-world settings (Ebbesen & Konecni, 1980; Lynch, 1982). The critical limitation in such classical theories is their explicit reliance on analytical thought as the route to rational decision-making; a reliance which ignores the role that intuitive processes play in everyday decision-making (for a comprehensive review of this issue see Stanovich & West, 2000).

There are at least four reasons to think that intuitive (or unconscious) decision processes play a primary role in everyday decision-making and should not be ignored by researchers trying to understand social behaviour. First, traditional decision-making scenarios and real-life decision situations prompt differing patterns of neural activation, indicating that the two situations activate distinct processes of thought. Utilitarian judgements such as those used in traditional economics research only activate neural networks associated with analytical thought processes, whereas more personalised moral dilemmas activate neural networks associated with both intuitive and analytical thought (Greene, Nystrom, Engell, Darley, & Cohen, 2004). Second, research on moral decision-making shows that intuitive decision processes play a critical guiding role in our moral decision-making strategies, often prompting choices in the absence of conscious rationalisation (Cushman, Young, & Hauser, 2006; Haidt, 2001), and even prompting choices which we find difficult to rationalise post-hoc (Denes-Raj & Epstein, 1994). Third, intuitive decision making processes are well adapted to, and often preferred for, guiding decision-making in real-world situations and often outperform more analytical decision processes (Hammond et al., 1987; Sjöberg, 2003). Fourth, a growing body of research shows that differences in decision-making strategies, reflecting differences in individual intuition and experience, clearly impact on our decision-making behaviour and influence our subsequent affect (e.g., Gross & John, 2003; Higgins, 2000; Lönnqvist, Leika, Paunonen, Nissinen, & Verkasalo, 2006). In summary, real-world decision-making involves both intuitive *and* analytical thoughts, both of which may be relied upon to instigate behaviour

and generate subsequent affect. By focusing on axiomatic reasoning and ignoring important social cues relevant to intuitive decision-making "the *purely* economic man is indeed close to being a social moron" (Sen, 1977; p. 336).

Beyond Classical Decision Theory

The point of the chapter thus far is not to denigrate the work of past economists or experimental social psychologists whose research has laid the platform for our current understanding of the regret. Rather it is to illustrate that a paradigm-shift in our understanding of decision processes is required if we are to adequately move from studying regret in a laboratory to studying regret in real-world settings. In reality we do not rely exclusively on an explicit critical analysis of each component of a decision situation. To do so would be both cognitively demanding and potentially dangerous in circumstances requiring quick thinking (Stanovich & West, 2000; Todd & Gigerenzer, 2000), and some real-world decisions are simply too complex and require individual experience or preference for 'optimal' decision selection (Gigerenzer, 2008). As Chase et al. (1998) note, "expecting people's inferences to conform to classical rational norms in such complex environments requires believing that the human mind is…a supercomputer with unlimited time, knowledge, and computational power" (p. 207). Instead of viewing analytical and intuitive processes as contrasting alternatives, Evans and Over (1996) claim that axioms of rational choice can operate as decision guides *in conjunction with* more subjective inferential guides. They maintain that individual preferences, which they call 'personal rationality', provide another basis for making 'rational' decisions and they claim that real-life decision-making can be considered rational if that decision is supported by *either* impersonal or personal rationality. The combination of such personal and impersonal systems of thought is an emerging theme in the decision-making literature (see Epstein, 1994; Smith & Kirby, 2000), and reflects what is commonly called a 'dual process' theory of reasoning.

What is a Dual Process Theory?

A variety of dual process theories exist in the social psychology literature (see Chaiken & Trope, 1999), but all state that decision-making is guided by two specific cognitive systems; an implicit/intuitive process and an explicit/analytical process. These two cognitive systems have been referred to variously as tacit and explicit processing stages (Evans & Over, 1996), impulsive and reflective mental faculties (Deutsch & Strack, 2006), and system 1 and 2 thinking (Stanovich & West, 2000). For the purpose of simplicity we will use Stanovich and West's (2000) 'system' labels though further description of these two systems will not necessarily reflect only Stanovich and West's characterisation. System 1 is an implicit system of reasoning that promotes decision-options based on their relationships with our personal experiences, biological drives, goals or desires (i.e., factors related to our implicit self-concept). System 1 provides a fast and effective proxy for reasoning in that we are often simply oriented towards some decisions that feel 'right' and away from those that feel 'wrong', while no overt analysis of the situation need ever enter conscious thought. However, in the event that a preferred option is not forthcoming from System 1 (i.e., a novel situation is encountered, or the decision appears difficult; see Alter, Oppenheimer, Epley, & Eyre, 2007), System 2 processes can be initiated to provide a more thorough analysis of the situation. System 2 de-contextualises and de-personalizes situations by excluding situational goals as key determinants of action, and judges the worth of potential responses based on their adherence to logical rules and principles (Stanovich & West, 2000). The key features of these dual processes are illustrated in Table 2.

Table 2

Key features of a dual process model of thought.

System 1	System 2
Intuitive	Analytical
Implicit	Explicit
Fast	Slow
Situation-specific goals as motivation for decision	Cross-situational values and principles as motivation for decision
Low cognitive demand	High cognitive demand

Toward a Dual-Process Model of Regret

I propose that historically our inability to predict diversity in regret levels in real-life is due to a reliance on analytical theories of decision-making and a constant disregard for the impact of intuitive decision processes. The cognitions inherent in regrettable decision-making may be ideally addressed by a dual process theory, as indicated by Connolly and Reb (2005) who hinted that "the interweaving of thought and feeling that characterize regret provide the bridge between System 1 and System 2 processes" (p. 654). The idea that humans utilise a dual process system of thought when making decisions is now widely, though not universally (see Osman, 2004), accepted in psychology (e.g., Alter et al., 2007; Haidt, 2001), and provides a good account of decision-making in areas related to regret research such as moral decision-making (see Cushman et al., 2006; Greene, 2007; Pizarro & Bloom, 2003).

The challenge is now to identify the factors underpinning the operation of our intuitive system 1 and analytical 2 processes and to illustrate their modus operandi. I will incorporate both the intuitive and analytic processes in my existing model of the regret experience, and illustrate how the interplay of these two processes generates a range of regret intensity. There are factors external to the decision process which may alter the experienced level of regret (e.g., the magnitude of the poor outcome) but they have been covered by past literature and, as with other current theories of regret (such as Connolly & Zeelenberg, 2002, which I will cover shortly), the concern of this thesis is to focus on understanding the impact our *decision-making processes* have on regret rather than create an omnibus model of all potential sources of regret.

An important place to start an exploration of potential system 1 and 2 processes is with some recent research on regret. Although still focusing on the idea of normative rationality in regrettable decision-making, Decision-Justification Theory (DJT; Connolly & Zeelenberg, 2002) provides an elegant solution to the problem of accounting for multiple variables impacting on regret intensity by incorporating them into the justification process. DJT simply views regret as resulting from a two-fold process; the realisation that our outcome compares poorly to another real or imagined one (i.e., an upward counterfactual), and the recognition that our decision was not justified (i.e., a poor quality decision). While the existence of an upward counterfactual has long been a recognised necessity for the onset of regret (see Byrne, 2002, 2007; Gilovich & Medvec, 1994, 1995a; Roese, 1997; van Dijk & Zeelenberg, 2005; Zeelenberg, 1999b), the introduction of individual justificatory

processes in the exploration of regret is innovative. Subsequent research on the link between justification and regret shows that the presence of a justification for our decisions does account for substantial variance in our levels of regret (e.g., Bonnefon & Zhang, 2008; Connolly & Reb, 2005; Inman & Zeelenberg, 2002; Zeelenberg et al., 2002). While DJT has proved useful in highlighting a key process underlying regret, there are specific aspects of DJT that limit its utility in predicting levels of experienced regret.

Connolly and Zeelenberg (2002) draw our attention to two specific aspects of regrettable decision-making that are not specifically addressed in DJT and which require investigation if we are to understand decision pathways to regret. First, while regret is both a felt and a reasoned emotion there is little literature on the link between our feelings and our subsequent decision-making, thus largely ignoring the potential impact of feeling-linked intuitions. Second, though common sense indicates that justification strength should be directly linked to regret intensity (i.e., regret should be lower for a strongly justified decisions) we still understand little about individual variation in justification use, or what even makes for a strong justification. Thus, in support of Connolly and Reb's (2005) argument that regret is linked to both implicit and explicit thought processes, Connolly and Zeelenberg indicate that two critical areas related to the experience of regret are (1) intuitive – or feeling-based – decision-making, and (2) variation in explicit justification use. Subsequent to the publication of DJT one key set of studies has explored how variations in justification strength can impact on regret intensity. Pieters and Zeelenberg (2005) explored the potential impact of justification strength on voting behaviour and consumer purchasing and found that, when faced with a poor outcome, strongly justified decisions did indeed produce less regret than weakly justified decision. However, despite the growing call to explore intuitive or feel-based decision processes in the experience of regret, there has been little if any such research.

Behavioural-Consistency as a System 1 Process

In addition to exploring the influence of justification strength on regret intensity, Pieters and Zeelenberg (2005) explored the ramifications of acting against prior intentions (i.e., intention-behaviour inconsistency). They found that participants felt greater regret for a poor result when they had acted against their prior intentions (i.e., they bought a product that they hadn't intended to buy), and that this regret was only reduced through the use of a *strong* justification. Pieters and Zeelenberg's focus on an individuals' behavioural

consistency highlights the fact that we all enter decision-making situations with individual preferences or intentions and, regardless of the individual nature of these intentions, contradicting these can lead to regret. Research shows we regret behaviours that contradict our personal values of tolerance or social justice (Lönnqvist et al., 2006), our personal option preferences (Crawford, McConnell, Lewis, & Sherman, 2002), and even our personal preference toward omission or commission (Seta, McElroy, & Seta, 2001). The idea that we will feel worse for contradicting our preferences or intent also forms the basis for theories of self-consistent decision-making such as the theory of *Regulatory Fit* (Camacho, Higgins, & Luger, 2003; Higgins, 2000).

While I agree that self-consistency is a primary motivator for behaviour, I argue that the decision process that ensures behavioural consistency in everyday decision-making is (largely) an implicit, rather than explicit, decision process. Pieters and Zeelenberg (2005) quantified behavioural consistency as a match between explicit situational intent and subsequent behaviours, but acting in a behaviourally consistent manner does not require an explicit analytical statement of prior intent as many of the preferences that we act on in everyday decision-making are driven by more intuitive or unconscious processes (Stanovich & West, 2000). Research shows that goal-consistent behaviours can actually be triggered unconsciously simply by being in the presence of appropriate social or situational cues (e.g., Aarts, Custers, & Holland, 2007; Bargh, Gollwitzer, Lee Chai, Barndollar, & Trötschel, 2001; Fitzsimons & Bargh, 2003). The evolution from an analytical contemplation of pros and cons to an implicitly activated, goal-directed, behaviour is the natural result of consistent repetition of behaviour paired with positive (or goal confirming) feedback (see Custers & Aarts, 2005). When we repeatedly enact behaviours that result in the desired end the future enactment of such behaviours in similar situations becomes 'semi-hard-wired', requiring little or no conscious effort to activate. This implicit activation process is individualised; the goal-consistent behaviours activated are, by their very nature, reflective of the self-concept and the goals and desires deemed important to an individual. The tendency towards behavioural consistency is therefore an implicit process resulting from subjective feelings or valence (i.e., good or bad) defining the options available. In the following chapter I will describe the basis for this claim and outline the mechanisms by which implicit behavioural-consistency is enacted.

Decision-Justification as a System 2 Process

Pieters and Zeelenberg (2005) expanded on Connolly and Zeelenberg's (2002) dichotomous assessment of justification (i.e., present/not present) by showing that the *strength* of a justification matters as much as its presence. They do not however provide a description of the mechanisms that might underpin justification 'strength' and the assumption in their work is that prior product quality information acts as the basis for justification strength (i.e., the more pertinent the information the stronger the justification). This stills leaves Connolly and Zeelenberg's (2002) question as to the basis for a 'good' justification largely unanswered. While product quality information may be an acceptable justification basis in purchasing situations, such objective information contrasting specific options is not often available, or even possible, in everyday non-consumer situations. What information would act as such a decision-quality proxy when I am deciding whether to marry my partner, or deciding whether to proceed with a medical procedure, or attempting to discipline a child? How would such information generate variation in the strength of justifications?

In situations with no basis for objective assessment we would likely rely on our own subjective assessments of decision quality. Such subjective assessments would likely reference our strongly held personal values and convictions about what we deem right and appropriate in these situations (see Schlenker & Trudeau, 1990; Tantam, 2002). This line of thought reflects Stich and Nisbett's (1980) work on 'expert reflective equilibrium', which posits that a decision is only justified when it is based on the considered judgements of experts who have arrived at their own decisions through the application of principled and rule-based assessments of external evidence. Stich and Nisbett claim that the 'expert' cognitive authority may be external in some cases (e.g., financial analysts, court judges), but that we make our own judgements as to who constitutes the 'expert' in each situation. Consequently I argue that, as we are the cognitive authority on our own lives and our desired ends, in situations where no obvious standard for justification exists *we* represent the only potential 'experts' who can judge the worth of our choices in comparison to our strongly held values or convictions. The basis for justification strength is therefore in the extent to which decision options adhere to the strongly held values or convictions of the individual engaged in the decision process. The more we can claim our decisions are based on these factors the less we should experience regret as our values or convictions provide strong *subjective* bases for our actions. In the following chapter I will outline the basis for

this claim and show that there is a natural tendency towards value-based justifications in our efforts to reduce potential regret.

Summary

I argue that the processes of behavioural consistency and decision justification reflect the independent operations of an intuitive and an analytic system of thought respectively, and that both can be employed in a dual process theory of regret. Behavioural consistency is a well recognised tendency in human decision-making which evolves over time and experience into an implicit guide which requires little explicit reasoning to implement. Decision-justification is crucial to our decision-making as it provides a standard of 'subjective rationality' on which to base our decision selection. These dual processes govern our decision-making approach in everyday situations and will, as a result, play a key role in dictating the level of regret we will feel for regrettable decision-making. The proposition is that once we recognise that our decision constitutes a regrettable one (i.e., the constituent components of regret are evident) then a review of the processes leading to this decision will dictate the general level of regret experienced as a result of the decision process[2] (see Figure 3).

My treatment of behavioural consistency and justification stands in contrast to Connolly and Zeelenberg's (2002) DJT which views regret solely as the result of an unjustified and comparably poor outcome. DJT's view of regret dismisses the role that intuitive thought plays in regret and fails to address the impact of variation in justification use on regret intensity. DJT cannot therefore account for decision-making derived from anything other than an explicit thought process which, as I have noted, is not reflective of everyday decision-making. My proposition also contrasts with Pieters and Zeelenberg's (2005) work for the same reason; they fail to address the role that intuitive processes play in the experience of regret. A second basis for contrast with Pieters and Zeelenberg (2005) is that my view of justification provides a basis for the notion of justification strength in everyday decision-making (rather than being limited to decision-purchase scenarios),

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[2] One can argue that the dual-processes outlined in my model may actually operate during the decision-making process prior to the recognition of regret (which is likely the case). However, I have placed them between the recognition of the emotion and subsequent affect because (1) assessment of the quality of our decision process is likely post-hoc (occurring after realisation of regret), and (2) it is easier to illustrate their combined role in generating the varying levels of regret intensity.
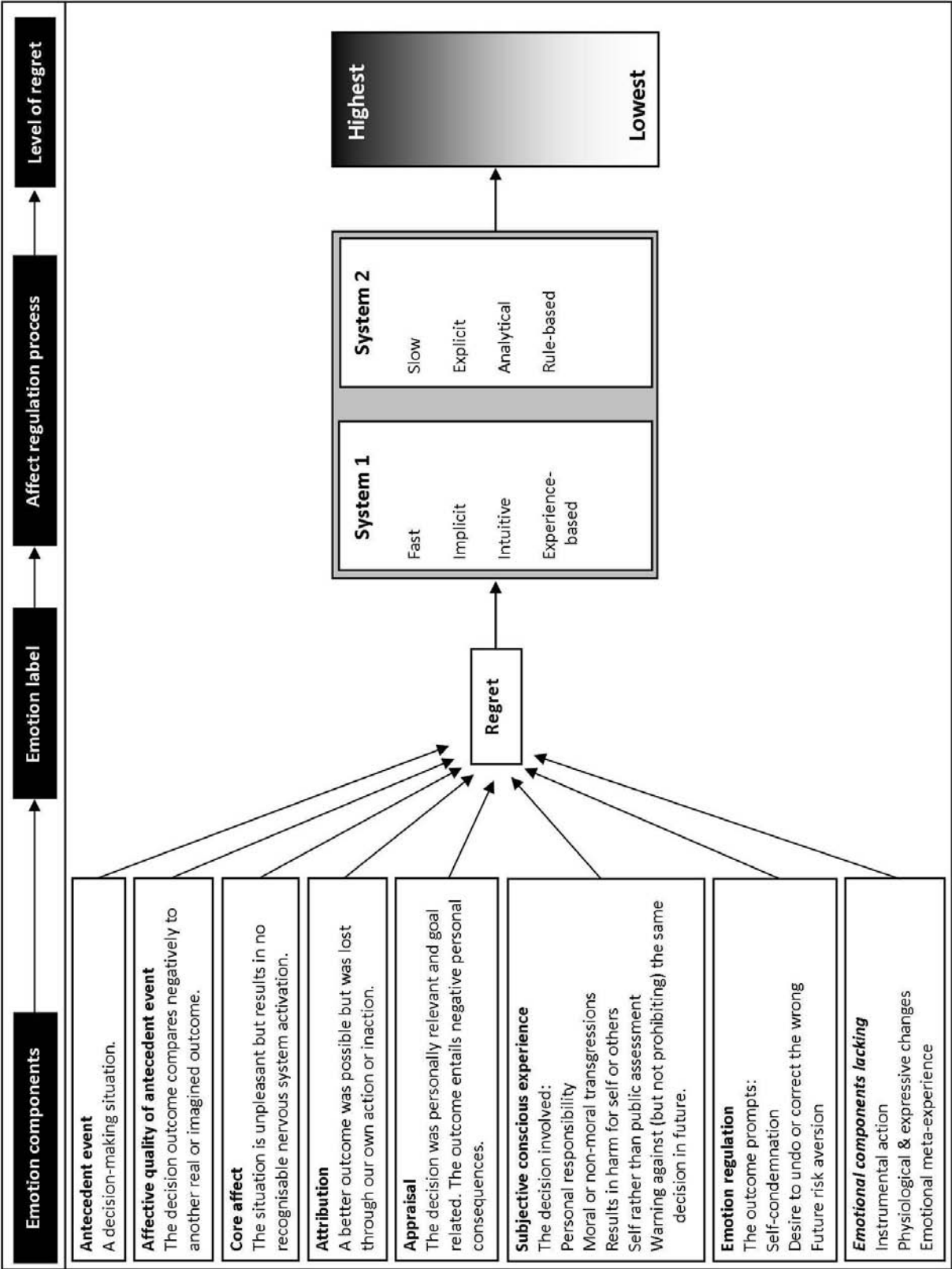
Figure 3. A basic dual-process model of regret showing the constituent components of regret and the basic dual-process process determining regret intensity

thereby answering Connolly and Zeelenberg's original query and also more accurately reflecting real-life patterns of justification use and resulting regret intensity. This will ultimately be the first theory of regrettable decision-making that aims to explore beyond the traditional boundaries of analytical thought by explaining how regret intensity is influenced by both the implicit and explicit thought process used in everyday decisions.

CHAPTER 4.
THE DUAL PROCESS THEORY OF REGRET (DPTR)

Intuition and concepts . . . constitute the elements of all our cognition, so that neither concepts without intuition corresponding to them in some way, nor intuition without concepts, can yield a cognition.

Immanuel Kant

In this chapter I propose a Dual Process Theory of Regret (hereafter DPTR) based on the idea that the regret stemming from our decision-making process is directly attributable to the operations of two specific systems of thought. The first system of thought, which I refer to as *Decision-Orientation*, reflects the implicit process by which we ensure a degree of behavioural consistency in our actions over time. The second system, which I refer to as *Decision-Justification*, reflects the explicitly analytical process by which we attempt to justify our decision making. In this chapter I will clarify the basis for each system, illustrate the mechanisms by which these systems operate, specify how each system independently influences regret stemming from a poor outcome, and show how the operation of these two systems in combination results in a broad range of regret levels.

System 1: Decision-Orientation

Emotions such as regret are 'self-relative' as they necessarily involve a reference to a set of personal standards, rules, and goals in order to be felt or determined (see Lewis, 1999). These standards, rules, and goals (hereafter simply referred to as *goals*) reflect core aspects of our self-concept and the ideals we see as self-defining (Higgins, Bond, Klein, & Strauman, 1986; Markus & Wurf, 1987; McClelland, 1985; Steele, Spencer, & Lynch, 1993; Swann & Read, 1981). I propose that these goals provide a behavioural guide, our *decision-orientation*, which unites our attitudes and behaviour by promoting behavioural options that are consistent with our self-concept. Burnett (1991) found that an individual's self-concept impacts significantly on their decision-making style, and D'Zurilla and Goldfried (1971) claim that "an individual's general orientation...can greatly influence the way in which he [*sic*] will respond to that situation" (p. 112). The existence of a system promoting a preference for self-consistent behaviours has an established history in decision-making

theory, with similar notions reflected in Jones and Gerard's (1967) *unequivocal behaviour orientation*, Berzonsky's (1989) *decision-making orientations*, and Gaus' (1990) *value orientation*.

Unlike previous notions of behavioural orientations, the current proposal is that our decision-orientation is an *implicit* guide developed through prior experience and activated in response to the recognition of situational cues rather than an explicit process of goal-based assessment. While we use decision-orientations to guide our decision making, this does not necessarily mean that we will always make orientation-consistent decisions. Orientation-*inconsistency* is actually at the heart of the System 1 process in the DPTR because, as will be discussed below, inconsistent behaviours promote the greatest regret intensity.

Decision-Orientation: How it Influences Regret Intensity

Since the work of Lecky (1945) the pursuit of self-consistency has been a strong theme running through much of the social psychology literature. Common to such theories is the idea that behaviours inconsistent with our core goals will result in negative affect. For example, both the self-consistency (Aronson, 1995, 1999) and self-standards (Stone & Cooper, 2001) revisions of cognitive dissonance theory state that dissonance is aroused because our behaviour has not met the self-relevant criteria specific to the situation at hand. Higgins (2000) theory of 'regulatory fit' states that, irrespective of the outcome of a decision, we will feel better if there is a 'fit' between our behaviours and our decision-orientation, and worse if there is behaviour-orientation conflict. Behaviour that conflicts with our orientations generates internal cognitive tension based on the fact that our behaviour is not consistent with our recognised 'best-practice'. This reflects a *deontological* approach to decision-making, which is an approach based on the idea that our value-systems endorse certain actions and prohibit others, and that undertaking prohibited actions is wrong irrespective of the outcome (i.e., it's not whether you win or lose it's how you play the game; see Alston, 1988; McNaughton & Rawling, 1998). This contrasts with the *consequentialist* approach to decision-making favoured in the economics literature, which states that any action – whether it violates strongly held values or not – is appropriate if it returns the greatest reward possible (i.e., the ends ultimately justify the means; see Louise, 2004; McNaughton & Rawling, 1998).

In order to avoid conflict between our orientation and our behaviour we therefore employ a very simple, and mainly sub-conscious, decision-selection heuristic; namely, "what feels right *is* right and what feels wrong *is* wrong" (Camacho et al., 2003, p. 498). Bastick (1982) believes that emotional valence (i.e., right versus wrong) is what underpins our subjective satisfaction with intuitive decisions, claiming that acceptable intuitive responses necessarily 'feel right' or 'smell right' to the individual. When we do something that does *not* feel like the intuitively right thing to do we are implicitly acknowledging the *lack* of positive affect associated with our decision. I believe that when faced with a regrettable decision, greater regret will result from orientation-*inconsistent* decisions than orientation-*consistent* decisions. This is because the former will always feel 'wrong' and the latter 'right', which in the face of our poor decision will simply emphasise the fact that we chose the worse option.

Decision-Orientation: Situation-Specific rather than Cross-Situational

In line with Shoda and Mischel's (2000) view of contextually-consistent personality expression, I view decision-orientations as *situation-specific* expressions of our broader self-concept triggered by factors in each situation that either threaten or activate certain aspects of our self-concept. A decision-orientation is thus a motivating guide based on a select 'version' of our self-concept tailored to the specific conditions of each situation. The idea that we employ a situation-specific form of our global self-concept to make decisions has substantial support in the decision-making literature. Markus and Wurf (1987) note that aspects of our global self-concept are not always accessible for daily decision-making and we instead rely on situation-specific 'working' self-concepts, which can be viewed as "a continually active, shifting array of accessible self-knowledge" (p. 306). This also resembles Wheeler, DeMarree, and Petty's (2007) notion of an 'active' self-concept where self-guides for our situational behaviour depend on which components of the global self-concept are currently activated in each situation. 'Active' self-concepts are therefore focussed versions of our global self-concept activated by specific triggering stimuli in the situation at hand (e.g., environmental cues, physiological arousal), and any further reference to 'active' or situation-specific self-concepts in this thesis will reflect this definition.

The active self-concept only possesses the guiding principles of the broader self-concept that are relevant to goal pursuit in the *situation at hand* (e.g., a corporate boardroom), while other guides relevant to alternative situations (e.g., a nightclub) remain

inaccessible. This system therefore overrides the potential conflict created by simultaneously accessing *all* of the often competing or diverging guides that constitute our global self-concept. To this end a woman can be both a doting mother at home and an aggressive lawyer in the court room while still maintaining a consistent self-concept. This is because the two situations (i.e., home and a court room) activate dissimilar goals, and therefore, dissimilar decision-orientations. This also supports the idea that we might regret certain behaviour (e.g., aggression) in one context but not in another, because the dissimilar contexts promote different decision-orientations (e.g., caring in one situation and aggressive in the other), and regret will only ensue if the behaviour in question conflicts with the activated decision-orientation.

Decision-Orientation: Exemplar Responses

Forgas (1999) stated that "most people have a rich repertoire of…crystallized, predetermined reactions and evaluations to draw on when conditions do not warrant more extensive processing" (p. 601). This indicates that System 1 processing draws on sets of pre-determined responses in order to make fast and efficient reactions, but it is important to highlight the process by which specific reactions may be selected in some situations but not others. As System 1 thought is 'rapid, automatic, and effortless' (see Kahneman, 2003b, p. 1453), these pre-determined or default responses (henceforth *exemplar* responses) are likely linked to specific triggering mechanisms in the environment or the activation of specific situation-specific self-concepts (see Matthews & Wells, 1999; Norman & Shallice, 1986; Wheeler et al., 2007).

The 'somatic marker' hypothesis (Damasio, 1994; Damasio, Everitt, & Bishop, 1996) provides an excellent account of the mechanism underlying the generation of exemplar responses. Damasio proposed that decision selection is guided by the presence of physiological 'markers' which enhance or detract from option desirability. This 'marking' occurs in the systems of the ventromedial prefrontal cortex, which establishes associations between our factual knowledge (e.g., knowledge of our context, environment, and goals) and our bioregulatory states (e.g., happiness, sadness, anger) (Bechara, Damasio, & Damasio, 2000). In a very simple sense, when behaviour results in successful goal attainment the positive bioregulatory state resulting from goal attainment becomes linked with the performance of said behaviour, thus positively valencing it (i.e., marking it) and pre-disposing it to selection in similar subsequent situations. The operations of the

prefrontal cortex have also been implicated in the recognition of regret. Camille et al. (2004) found that patients with damage to their orbitofrontal cortex were unable to anticipate the potential regret that might stem from the negative actions, and that when such negative outcomes prevailed they were also unable to feel regret at all. This indicates that the recognition of regrettable acts likely relies on the existence of orbitofrontal cortex generated somatic markers which provide a guide for behaviour selection and the biological states associated with both positive and negative outcomes.

The somatic marker hypothesis provides a clear account of the process underlying the generation of exemplar responses in daily decision-making, and Frank, Cohen, and Sanfey (2009) provide a great example of this process in action:

> *When deciding between salmon and steak at a restaurant, one does not explicitly recall each and every experience with the two foods. Instead, one makes a ''gut level'' decision supported by a system that has slowly integrated good and bad representations of action values based on one's accumulated life experience. Thus, regular customers might order ''the usual'' without even thinking twice*. (pp. 74-75).

The predisposition to selection distinguishes exemplar responses from other intuitively 'unwise' options, and the use of exemplar responses serves four desirable ends: (1) they are cognitively economical, (2) they avoid potentially harmful delays in action, (3) they are triggered by our self-concept and therefore maintain our fundamental need for self-consistency, and (4) they reduce the potential for dissonant choice selection. Regret resulting from the use of exemplar responses should be less intense than that resulting from the use of alternative (i.e., non-exemplar) responses, because the former have positive somatic associations and, despite resulting in a poor outcome, represent the intuitively appropriate action and necessarily feel like the 'right' decision. In contrast, non-exemplar responses have neutral or potentially negative somatic association and represent un-intuitive or aversive options which simply feel 'wrong' or inappropriate.

Summary of System 1: Decision-Orientation

Our decision-orientation is an intuitive decision-making guide promoting self-consistent choice selection as optimal for maintaining a stable sense of self-consistency. Our decision-

orientation is situation-specific, as the context at hand activates a situation-specific form of our self-concept which in turn promotes situation-specific personal goals. Once activated, the decision-orientation promotes exemplar responses as default options based on their previous success or their alignment with our self-concept, and their selection provides a positive somatic association which lowers regret intensity in the event of a poor outcome.

System 2: Decision-Justification

Connolly and Zeelenberg (2002) state that the various situational factors that earlier researchers identified as central to regret merely act as sources of justification for our behaviour, and the mere presence of a justification reduces regret. In addition to the empirical support for justification's regret-reducing capacities mentioned earlier, further theoretical support can also be found in Aronson's (1995, 1999) revision of cognitive dissonance theory. Aronson states that the primary motivation when faced with a dissonant decision or behaviour is to reduce that dissonance, and the most likely path to dissonance reduction is through self-justification. Justifying behaviour reduces potential dissonance by facilitating a return to a perception of the self as moral and right, thus protecting the integrity of our self-concept (Aronson, 1995). I agree with the central position accorded to justification in DJT's assessment of regret, but argue that an expanded view of justification is possible and it would provide greater differentiation of regret intensity than is evident in DJT.

Decision-justification: An Expanded View

Connolly and Zeelenberg (2002) viewed justification as a binary process (i.e., present/not present); this view of justification is limiting as it implies that justification use lacks variability. However, Shealy (2005) claims that in everyday decision-making there is "great variability in the types of justifications that are expressed to explain why one's claims, thoughts, or actions are warranted" (p. 97). Pieters and Zeelenberg (2005) provide for greater potential variability in regret by claiming that justifications can vary in strength (i.e., from strong to weak). But they fail to provide an operational definition of what constitutes 'strength', instead manipulating justification strength in their 'consumer purchase' scenario by varying the degree to which information overheard prior to purchase is actually

pertinent to the quality of the product (i.e., the more pertinent the information the stronger the justification).

Extending Pieters and Zeelenberg's (2005) findings to the realm of everyday decision-making in social contexts, I argue that there is variability in the strength of the justifications we use but a clearer and more robust distinction *can* be made between strong and weak justifications than exists in the current literature. I propose that a hierarchy of justifications exists such that strong justifications affirm intrinsic personal values, ideals or principles (hereafter simply referred to as *values*) and weaker justifications are associated with impersonal or circumstantial reasoning (e.g., social norms). This variability in justification strength will have immediate impact on the level of regret experienced for a bad decision, such that decisions based on strong justifications will promote less regret than those based on weak justifications.

Decision-Justification: Varying Strength of Justifications

We use many different kinds of justifications in our lives, from those relied on in everyday reasoning (Mullins & Tisak, 2006), to those specifically enacted to excuse extramarital infidelity (see Glass & Wright, 1992); even 4-year-old children's justification use differs by context (Orsolini, 1993). Given this variation in justification use, the question arises as to what constitutes a *strong* justification. Tantam (2002) claims that some justifications are simply 'deeper' than others, while Williams (1981) argues that proper rationalisations must be linked to an individual's 'motivational set', in other words their intrinsic values and ideals relevant to the situation. Shealy (2005) goes further, claiming that a good justification is based directly on our strongly held values, beliefs, and convictions, and actually constitutes an active attempt to convey to others the idea that these values are "correct, defensible, and good" (p. 84).

A review of research on moral development and decision-making clearly shows that internalised values and subjective standards are presumed to represent a strong basis for the justification of behaviour. In Kohlberg's (1981) model of moral development, lower stage moral justifications rest on *external* standards such as generic social rules, whereas higher level moral justifications are based on *internalised* ideals such as justice and liberty. Despite intense criticism regarding the underlying tenets of Kohlberg's theory (e.g., Murphy & Gilligan, 1980), both critics and supporters of Kohlberg's original theory agree that reasoning based on subjective understanding of contexts and values, rather than adherence

to 'objective cultural ideology', reflects the pinnacle of moral development (e.g., Rest, Narvaez, Bebeau, & Thomas, 1999). In support of the notion that internalised values supersede more external characteristics as a basis for a strong justification, individuals see their behaviour as more justifiable (i.e., stronger) when that behaviour reflects personality traits they see in themselves, and less justifiable when behaviour is not congruent with their self-concepts (Nisan & Koriat, 1989; Schlenker & Trudeau, 1990). This suggests that a hierarchy of justifications exists where internalised values represent a strong basis for reasoning and objective, externally-focused, or less-self-relevant rationales provide weaker justification for behaviour.

I argue that the strength of self-relevant over non-self-relevant justifications lies in the former's limited *defeasibility* (i.e., self-referent justifications are *less* susceptible to counter argument). Our self-concept comprises core knowledge regarding how we define ourselves and interact with society (Markus & Wurf, 1987), and this knowledge therefore represents for each of us our own self-relevant 'truths' (e.g., 'I am primarily motivated by money', or 'I feel family should always come first'). As defining features of our self-concept, internalised values are the essence of our self-relevant truths. They reflect our guiding life-principles and act as important behavioural guides, providing strong reasons for us to act in a specific, self-consistent, manner (Maio, Olson, Allen, & Bernard, 2000; Rokeach, 1973). Internalised values are thus considered trustworthy sources of self-knowledge, and justifications based on these internalised values are considered subjectively strong and trustworthy justifications. On the other hand justifications based on situational or social norms do not inspire the same level of self-conviction as they are not motivated by a self-defining value system, and are therefore not considered as intrinsically 'trustworthy' reasons to act as internalised values. A key tenet of the DPTR (which should be apparent at this stage) is that the assessment of justification strength is a subjective process, as it is based on personal value systems that will necessarily vary from person to person.

Decision-Justification: Ego-proximal versus Ego-distal Justifications

I propose that people use two broad classes of justification; the first I will call *ego-proximal* and the second *ego-distal*. Ego-proximal justifications are based on internalised values, reflect strong internal motivation for behaviour, and are easily defended by an individual as their basis in self-referent knowledge provides subjective feelings of strength. Ego-distal justifications reflect an external value-system, such as a non-internalised social or peer

group norm for behaviour, are not considered as self-defining values and therefore do not inspire feelings of subjective strength (i.e., peer group norms may not necessarily reflect individual goals or desires, but may inspire action simply as a means of maintaining group membership or cohesion). Ego-proximal and ego-distal therefore offer subjectively different standards for behaviour based on their reference to our personal values and beliefs or social norms for behaviour. When a situation arises we make a decision with reference to what, at the time, resembles the most appropriate – or perhaps simply the easiest – standard.

I view ego-proximal and ego-distal justifications not as specific *types* of justification, such as behaviours based on revenge or sexual-arousal motives, but more as core *themes* which underpin all justifications and provide their subjective strength. Mullins and Tisak (2006) explored six types of justifications adolescents might use in everyday decision-making, and a review of these justifications shows that they reflect either an underlying ego-proximal or ego-distal theme. The justifications categorised as *moral* (i.e., involving individual rights), *personal growth* (i.e., involving personal development), and *personal choice* (i.e., involving individual preferences) have strong ego-proximal themes, reflecting internal values as being central to decision choice. Conversely, the justifications categorised as *conventional* (i.e., involving social group norms), *punishment* (i.e., involving infractions of social rules), and *retaliation* (i.e., involving reactions to external provocation) are ego-distal justifications as they reflect social concerns as fundamental.

Regarding the use of these justifications, I argue that people should opt for ego-proximal justifications over ego-distal ones as a basis for decision-making because their subjective strength should provide less opportunity for self-criticism and, consequently, greater protection from regret. Dilley et al.'s (2002) research, which explores gay men's justifications for having unprotected sex, shows that this asymmetric reliance on ego-proximal over ego-distal justifications does occur. The justifications more often relied on reflected internal values or beliefs (e.g., I am usually careful), and the less endorsed justifications reflected external factors relevant to the situation or other person (e.g., this guy looks healthy).

Summary of System 2: Decision-justification

I propose three broad levels of justification use: (1) ego-proximal, (2) ego-distal, and (3) no justification at all. An ego-proximal justification will provide the most protection from regret as it utilises internalised values (reflecting core self-knowledge) as a valid rationale for decision-making. An ego-distal justification will somewhat shield the agent from regret as it does provide a basis for our behaviour. However, the reliance on a social value or situational rationale rather than personal values as the basis for behaviour increases the likelihood of regret as the decision basis is subjectively indefensible (i.e., it is based on reasoning which we do not necessarily believe in). Finally, regret will be greatest for an individual with no justification for a bad decision as, in the absence of either a personal value or social norm against which to rationalise our decision, it was clearly irrational and, as such, impossible to defend.

A Dual-Process Theory of Regret Intensity

Combining the concepts of decision-orientation and decision-justification provides a comprehensive model of regret intensity which shows the different levels of regret which will result from the thought processes we employ in everyday decision-making. Figure 4 models this Dual Process Theory of Regret.
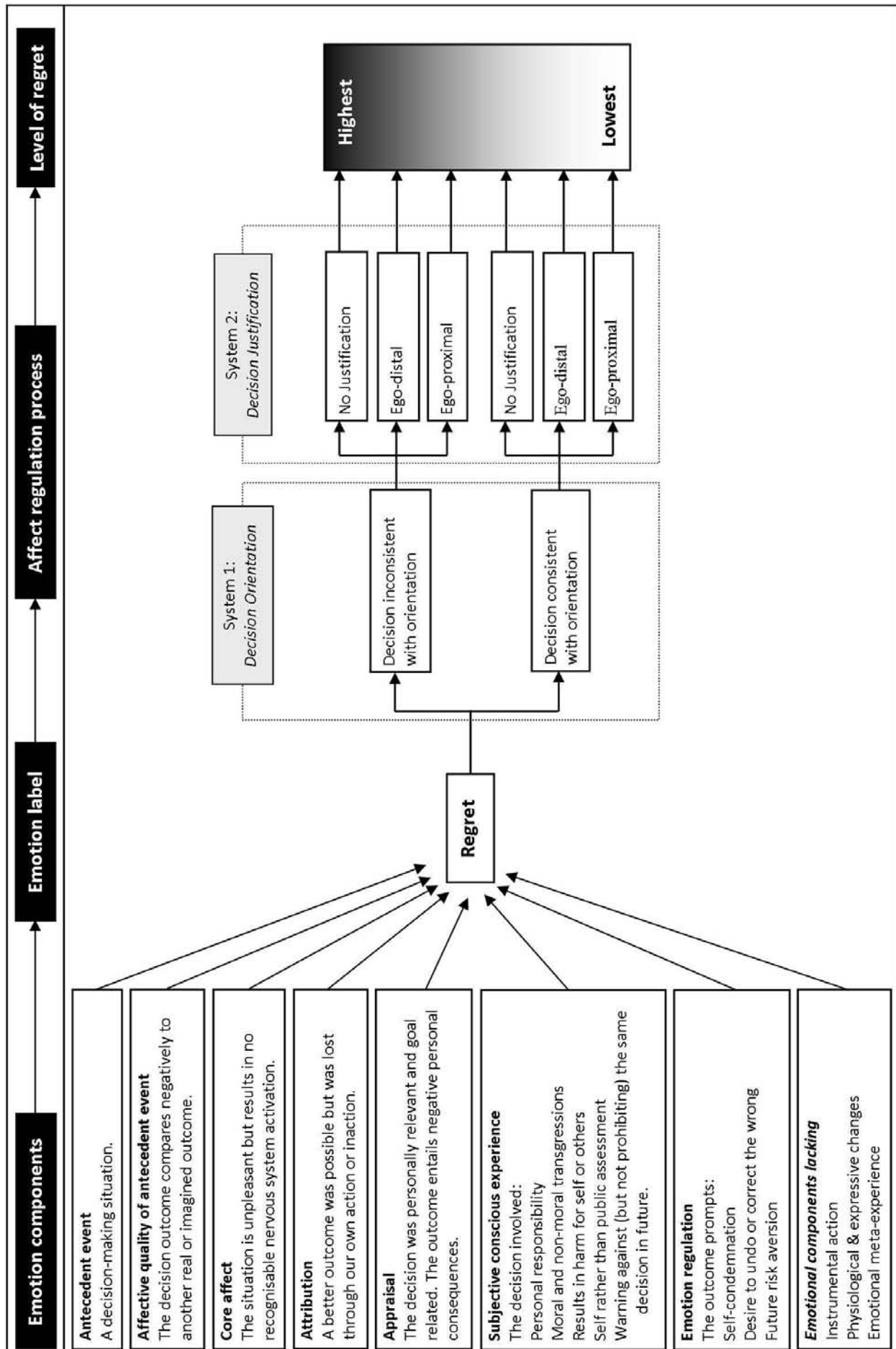
Figure 4. A complete model of the Dual Process Theory of Regret

Characteristics of the DPTR

   Dual systems: context dependence and independence. One of the key system differences I want to make explicit is that System 1 is considered context-dependent (i.e., the 'active' self-concept is generated to manage the *immediate* situation at hand), and System 2 as context *independent*, a distinction which is in keeping with most readings of System 1 and 2 in the literature (see Stanovich & West, 2000). System 1 relies on contextual information in order to trigger situation-appropriate exemplar responses, but System 2 processing requires reference to both personal and societal values and norms of behaviour, and explicit analysis of the relevance of these for the self, in order to implement a specific course of action. As such, System 2 views the self not in terms of the immediate situational constraints (i.e., an 'active' self-concept view), but at a broader level of cross-situational coherence more akin to a 'chronic' self-concept.

   The reason I draw attention to this distinction is to highlight the potential impact it has on decision-making behaviour and subsequent affect. The self-concept strivings underlying System 1 processing are envisaged as distilled, situation-specific versions of broader System 2 values; a distinction which mirrors both Gaus' (1990) and McClelland's (1985) work on values and motives. McClelland claims that both values and motives prompt behaviour but values operate at the conscious level as standards against which we analyse the appropriateness of our choice, whereas motives are situational instigators of behaviour which are derived from our values but operate at the unconscious level. Our implicit orientation and explicit justification can therefore have the same root value, and this alignment would provide a powerful 'shield' against regret as the behaviour in question not only 'feels' right but can also be explicitly justified as reflecting a value which we strongly believe to be right. However, our 'chronic' self-concept is composed of many, potentially competing, values presenting many opportunities for tension between System 1 and System 2. The concept of 'implicit attitudes' (see Greenwald & Banaji, 1995; Greenwald, McGhee, & Schwartz, 1998) provides a perfect example of this inter-system conflict. As System 1 is rapid and unconscious it may bypass attempts by System 2 to moderate responses or behaviour (see Kahneman, 2003a). The resulting behaviour may be interpreted as a measure of our 'unfiltered' or implicit attitudes, but when these implicit responses clash with our values they can create dissonance. Reverend Jesse Jackson, a stalwart of the African-American civil rights movement, provides a perfect example of such dissonance, stating "there is nothing more painful to me at this stage in my life than to walk

down the street and hear footsteps and start thinking about robbery. Then look around and see somebody white and feel relieved" (quoted in Arkes & Tetlock, 2004, p. 257). His implicit association of African-Americans with crime and street robbery – a System 1 response - is obviously in conflict with his explicit belief that we should not assume African-Americans to be more violent or criminal prone than their White-American counterparts – a System 2 value. While this example does not necessarily reflect a regrettable decision, it does show how orientation-justification conflict is possible, and when set in the context of regrettable decision-making it should be evident how such conflict would lead to feelings of doubt over the quality of the decision, and subsequently to regret.

Differential Generation of Regret Intensity

Matched system 1 and 2 processing. If a person acts in accordance with their orientation, and can bring to mind an ego-proximal justification, this ensures a decision which is subjectively robust. Regret will therefore be felt (albeit minimally) for a poor outcome merely because the boundary conditions of a regrettable decision have been met (i.e., we obtained a poor outcome when a positive counterfactual exists). System 1 affirms the decision as preferred by the 'active' self-concept, thereby producing positive affect regarding the phenomenological 'fit' of the action in question. A System 2 assessment of our decision also provides a strong rationale for the decisions based on its complementing our intrinsic values. No cognitive dissonance is thus produced regarding the process of decision-making, and the 'base' level of regret prompted by the meeting of the boundary conditions for regret is not further enhanced.

Mismatched system 1 and 2 processing. This reflects Audi's (1999) notion of 'defeat by overriding' where one already holds a justification for behaviour but internal conflict is generated by the recognition of a subsequent, competing, justification. Any mismatch between System 1 and 2 processes means the decision in question has generated incompatible cognitions, thus giving rise to cognitive conflict that threatens the stability of the self-concept and our faith in the basis of our behaviour. There are two specific ways in which these systems can be mismatched, and both paths reflect a less than optimal decision-making process. First, an orientation-consistent decision may be linked to an ego-distal justification. To *feel* that the decision is 'right' is at odds with our inability to express an ego-proximal justification for our actions; basically, if it felt right then we should be able

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to defend it with reference to strongly held values. Second, we may have an ego-proximal justification for our decision but it is inconsistent with our orientation; although there is a strong-value-based rationale for our behaviour it just does not *feel* like the right decision to make. The 'base' regret felt for the boundary conditions of regret being met is therefore further enhanced by the existence of a behaviour which (1) feels right but lacks a strong sense of justifiability, or, (2) feels wrong but is in some way justifiable.

Complete system 2 failure. If we cannot find any justification for actions that result in a poor outcome then regret will flourish as a lack of formal rationale supporting our choice of behaviour leaves us little ability to defend our action in a post-hoc analysis of the decision-process. However, even with a lack of justification, there is room for further differentiation in the experienced level of regret based on its consistency with our orientation. Decisions consistent with our orientation will generate less regret than inconsistent decisions because the decision 'feels' like the correct option, while orientation-inconsistent decisions lacking any justification have *no* grounds for support either in terms of their feeling right or in their having a strong underlying rationale.

Comparing DPTR to DJT

Both Connolly and Zeelenberg's (2002) DJT and Pieters and Zeelenberg's (2005) reformulation of DJT propose that justification of decisions will always lead to regret reduction, and this is a notion that underpins the DPTR. However, with the inclusion of intuitive decision-making, the DPTR provides greater understanding of regret than either of the above theories. A reformulation of the drink-driving scenario used by Connolly and Zeelenberg (2002) provides a perfect illustration of the strength of the DPTR over the DJT variants in predicting different levels of regret.

Let us suppose that two women decide to drive home (independently) from their respective parties despite being drunk, and both were caught by the police and subsequently charged for their action. Let us suppose that one of the women is a recidivist drink-driver and the other is in fact actively opposed to drink-driving. Both DJT variants and the DPTR would recognise that this is a regrettable decision as being caught by the police reflects a poor outcome with an obvious upward counterfactual (i.e., not being caught and getting home safely). The processes inherent in DJT predict no difference in the eventual

experience of regret for these women, while DPTR processes predict vast differences in the regret experienced. Irrespective of their different views of drink-driving behaviour, DJT predicts that regret for both women would be reduced if *any* justification existed or increased if a justification was *not* evident. Pieter and Zeelenberg's (2002) DJT reformulation provides for greater range of regret based on the strength of the justification used, but, unless the women voiced specific *prior* intentions to take a taxi or <u>not</u> to drive home, both would feel the same level of regret for voicing the same justification. If both women voiced the same justification for their behaviour (e.g., 'I had no other way to get home') then the DJT theories predict equivalent levels of regret.

In contrast to the DJT outcomes, the DPTR predicts significantly different levels of regret for these women deriving from the dissimilarity in their underlying value-systems and the different situational orientations such systems would promote. Drink-driving is likely orientation-consistent for a recidivist drink-driver (hence the recidivism) and orientation-inconsistent for an opponent of drink-driving, thus providing a positive reinforcement for the former and, conversely, increasing the 'base' regret for the latter. As drink-driving is orientation-consistent for the recidivist they can also likely call to mind an ego-proximal justification for this behaviour (e.g., 'I am a competent driver and alcohol doesn't affect me') which, though objectively unreasonable to anyone else, will nonetheless reduce regret further by providing seemingly strong *personal* grounds for her actions. Conversely, ego-proximal justifications which are aligned with drink-driving behaviour are not likely evident for the drink-driving opponent and their regret due to her poor outcome *and* orientation-inconsistency is even further heightened. There is a possibility that the drink-driving opponent might call to mind an ego-proximal justification which has nothing to do with the behaviour itself but implies another value-based reason for behaviour (e.g., 'I drove home as I needed the car early the next morning to pick up my children, and a good parent is always there for her children'). However, this justification will itself still cause some further increase in regret (though not as much as an ego-distal justification or lack of justification altogether) because dissonance will be aroused by the mis-match between her orientation-inconsistency and her ego-proximal justification. In either respect the DPTR still predicts that these two women would have considerably different levels of regret as a result of their underlying individual differences, while both DJT theories predict regret equivalency.

Addressing Potential Criticisms of the DPTR

In this section I examine a number of possible criticisms of the current formulation of the DPTR and explain how each possible criticism can be clearly refuted[1].

Criticism 1:   *DPTR seems to suggest that regret results from dissonance. In which case, how is DPTR not simply a restatement of dissonance theory?*

In very simple terms, the DPTR is not simply a dissonance theory because regret as conceptualised in the DPTR is not simply the result of dissonance. The theory of cognitive dissonance provides a very clear and elegant account of the tension generated by the existence of competing cognitions, but as applied to regret it can only indentify instances when regret is likely to be present or not (i.e., where dissonance occurs, so follows regret). Dissonance theory thus potentially sits alongside other concepts highlighted in Chapter 2 as potential indicators that regret is likely, but in no way provides an account of the likely level of that regret in comparison to other decisions.

The focus of the DPTR is the generation of differential regret *intensity* rather than simple identification of regret, and the DPTR predicts that regret intensity is a product of decision quality rather than simple dissonance. Cognitive dissonance theory is certainly applied in the DPTR in order to understand that the mis-match between decision-orientation and decision-justification processes is likely to create tension and, subsequently, regret. But variation in the intensity of regret is actually the result of varying the use of dual decision processes (decision-orientation and decision-justification). A further reason that the DPTR is not a simple restatement of dissonance theory is because it predicts that regret will occur in the absence of dissonant thought. For instance, even when no dissonance is aroused (i.e., acting in accord with ones decision-orientation and bringing to mind an ego-proximal justification) the DPTR predicts that some level of regret will still exist if the outcome of the decision is poor and the necessary components of a regrettable experience are evident (e.g., an upward counterfactual exists, personal responsibility is evident). Regret in this manner simply requires recognition of the specific components that engender a sense of regret (as discussed in chapter 2) and the existence of dissonant cognitions simply acts to enhance this regret. While the concept of dissonance is useful as

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[1] I am thankful to Associate Professor Keith Markman (Ohio University) and a further anonymous reviewer for providing these insightful critiques of the DPTR.

an underlying description of some of the regrettable thought processes evident in the DPTR, it is not in itself adequate to explain all of the cognitive pathways to regret and is, ultimately, subsumed by the DPTR.

Criticism 2:   *The DPTR looks like a simple reformulation of factors already addressed by previous theories (e.g., behavioural consistency and justification). How does it offer a substantial advantage over previous theories?*

Thagard (1978) provides three criteria on which to evaluate the worth of all new theories; *consilience*, *simplicity*, and *analogy*. *Consilience* refers to how much a theory can explain, and the characteristic of a good theory is that is explains more phenomena than theories that precede it. The DPTR builds on the theory of justification presented by previous researchers but goes beyond this theory by (1) providing a broader range of possible justification, (2) clearly outlining the basis for strong and weak justifications, and (3) illustrating the different levels of regret resulting from differential justification use. As evidenced by the theoretical drunk-driver scenario example provided earlier, the DPTR's combination of systems 1 and 2 processes is able to model regret reactions to real-life decision-making more accurately than prior theories of regret. This also provides the DPTR with the ability to account for a greater array of decision-making behaviours than prior theories (e.g., acting impulsively but with a strong justification versus acting impulsively with little or even no justification). The DPTR thus builds on and extends the work of previous researchers, providing greater knowledge of the experience of regret than any prior theory.

Simplicity refers to the ability of a theory to clearly describe a broad set of facts without the requirement of alternative or auxiliary hypotheses to account for facts that do not fit the theory. To use a quote from Einstein "Make everything as simple as possible – but not simpler." The DPTR's dual processes may seem more complicated than single-process theories, but they actually provide a comprehensive account of the real-life decision-making processes inherent in regret, and I provide a clear outline of the mechanisms by which they operate. This means that unlike previous theories there is no need for alternative hypotheses to account for decision-making that does not accord with analytical reasoning (i.e., gut-reactions, or akratic behaviour), or to explain justification choices.

Analogy refers to the ability to cite the operations or processes inherent in a different theory (even one outside the area in which you work) as grounds for use in your new theory. In this way a theory that is at least partly developed by analogy with another explanation/theory has 'fertility' or 'research promise' because this analogy provides impetus for exploring whether equivalent mechanisms or processes are evident in our new phenomena. The DPTR is the first theory to propose that regret is party to a dual-process system of thought, but dual-process theories are increasingly accepted as an explanation for a number of social psychological phenomena that have vast cross-over with regret research, such as moral decision-making (e.g., Cushman et al., 2006; Greene, 2007; Haidt, 2001; Pizarro & Bloom, 2003). This provides a clear indication that dual-process theories may have 'fertility' in explaining the mechanisms underlying regret as these same mechanisms have been used to shed light on decision-making phenomena closely related to regret.

In summary the DPTR is more than a simple reformulation of the work of Connolly and Zeelenberg (2002) and Pieters and Zeelenberg (2005) as it satisfies all three of the concepts proposed by Thagard; it offers (1) a greater understanding of regret and greater predictive power, (2) a straight forward and simple account of regret stemming from the processes inherent in real-life decision-making, and (3) analogy with other dual-process theories of reasoning which describe related social-psychological phenomena.

Criticism 3: *The DPTR focuses on maintaining orientation-consistency as a way to reduce regret. However, the macro-level function of regret is to reduce future regret by <u>changing</u> poor decision-making patterns (i.e., ensuring we don't commit the same mistake twice). How can the DPTR advocate behavioural consistency when the point of feeling regret is to inspire change?*

Two aspects of behaviour change need to be addressed in order to explain how this is addressed within the DPTR theoretical framework; (1) the speed with which behavioural change realistically takes place, and (2) the process inherent in such change. First, I acknowledge that a core function of regret *is* to prompt behaviour change in order to avoid future regret (see core component 10 'Emotion Regulation' in Chapter 2). However, human behaviour change does not resemble the instantaneous process of assessing goal match-or-mismatch envisaged by cybernetic theories of cognitive processing, where behaviours

which fail to attain required goals are automatically disregarded (see Karoly, 1993). No other example better shows our failure to adhere to negative feedback than the 'morning after' hangover (inevitably coupled with a vehement declaration you'll never drink that much again) which often has little or no impact on the likelihood that we will drink the same copious amount sometime in the future. Instead, human behaviour change often requires multiple rather than singular instances of negative feedback before the worth of a behaviour for goal-acquisition can be questioned, and similarly, whether this goal can seriously be questioned as an adequate or correct motivator for behaviour.

It takes time for us to learn, though the variation of behaviour and observation of subsequent results, that certain behaviours may consistently yield a poor outcome (Yechiam et al., 2006). System 2 is a relatively 'fast' learning system (i.e., if someone points out the problem of decision X we can see the wisdom of their advice and change decisions). System 1 is not as adaptive because it is based on the activation of unconscious 'decision' pathways which have become semi-hard-wired over time, and these pathways are not easily altered with one-off experiences. Research shows that such implicit attitude change requires long-term, repeated pairing of an explicit object/attitude/behaviour with either positive or negative valence before this new association overrides existing associations in memory and filters down to the implicit level (thus altering implicit behaviour by generating requisite exemplar responses) (e.g., Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000; Kawakami, Dovidio, & van Kamp, 2005; Petty, Tormala, Briñol, & Jarvis, 2006). The cognitive therapy technique of 'in vivo exposure' offers the perfect illustration of this simple process. Despite 'intellectually' knowing the folly of fearing spiders, your gut feeling on encountering one will be of pure dread, until repeated exposures extinguish this automatic reaction and replace it with a sense of calm or acceptance.

While regret serves as a warning to alter our future behaviour, it is only after multiple such instances confirm the inappropriateness of this behaviour that we would be prompted to seriously question this behaviour and the goals which motivate it. The DPTR is therefore based on the premise that – in general - first-time instances of negative feedback, while causing regret, are unlikely to warrant a change in behaviour based on core values or goals. Where such behaviour is *consistently* linked with poor outcomes the system will question the logic of adopting this behaviour in future. The valence of such behaviours within system 1 will therefore be altered (i.e., they acquire negative valence) so that new exemplar responses take their place.

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The second point I would like to address is: while I discount the impetus for change resulting from first-time negative feedback *in general*, there may certainly be individual cases where regrets cause us to instantly question the validity of our behaviour. This is likely to occur in situations where the regret is profound rather than trivial, and the greater the level of regret we feel the more urgent the motivation for behavioural change should be. For instance research shows that the higher the rate or intensity of feedback for poor decisions the greater the motivation for behavioural change (e.g., Bandura & Cervone, 1986; Jamtvedt, Young, Kristoffersen, O'Brien, & Oxman, 2006). As the speed of behaviour change is linked to regret intensity and regret intensity in the DPTR is a product of decision quality (i.e., system 1 and 2 process use), behaviour change should therefore be linked to decision quality. Orientation-consistent decisions with ego-proximal justifications inspire little regret so the impetus for future behavioural change will be limited as the decision-making process was subjectively faultless. However, orientation-inconsistent decisions with ego-distal justifications (or no justification at all) will inspire greater regret which should provide greater motivation for behaviour change in future.

In summary, while the motivation for future behaviour change is an acknowledged aspect of the experience of regret such change is not generally immediate and requires consistent exposure to disconfirming outcomes before change will be prompted. Furthermore, the speed of behaviour change is likely tied to the intensity of regret which in the DPTR is the result of decision quality, so orientation inconsistency with little or no justification is likely to spur behaviour change faster that better quality decision-making.

Criticism 4: *The DPTR is based on the premise that responsibility is a necessary component of regret. If this is the case, why would we regret system 1 reactions which are unconsciously enacted and which, therefore, should entail little or no responsibility?*

McClelland (1985) indicated that our unconscious motives are derived from consciously internalised personal values, and the DPTR is based on the same premise. In a similar manner Wigley (2007) proposes that automatic behaviours can be differentiated from simple 'automatism' (e.g., sleep walking) because, though both may be unconsciously activated, the latter has no prior directed intent while the former represent pre-programmed responses which necessarily reflect prior notions of goal attainment and value strivings. Implicit behaviours in the DPTR result from enacting specific exemplar responses

which are over-learnt behaviours tailored for activation in the presence of specific contexts. Though such responses are implicitly activated they are still designed to fulfil individuals' goal-acquisition needs and are therefore still reflective of underlying individual intent – albeit unconscious intent. In summary, the DPTR is based on the notion that responsibility is an inherent aspect of the experience of regret and that we are ultimately responsible for all our behaviour, whether implicit or explicit, as both serve the purpose of goal acquisition.

Criticism 5: *Behavioural consistency in the DPTR is illustrated as a system 1 process, but surely we also use system 2 processes to ensure that we act in a self-consistent manner?*

Self-consistency can definitely result from system 2 processing, but a distinction needs to be made between unconscious behavioural consistency processes (system 1) and an explicit evaluation of self-consistency (system 2). Behavioural consistency in system 1 reflects the immediate, automatic 'gut reactions' that behaviour appropriately accords with the motivations inherent in one's 'active' self-concept. It is a behavioural impulse, an impression of 'fit' between the behaviour executed and the situational or environmental factors that elicited this behaviour, rather than a reasoned assessment. In this respect, when behavioural consistency is addressed by system 1 processes it ensures a degree of self-consistency only in the sense that our responses satisfy the very specific situational goals triggered. Any subtle shift in such situational parameters may induce an alternative form of, or indeed a completely different, exemplar response to ensure that the new situation-relevant goals are attained.

Striving for self-consistency from a system 2 perspective takes the explicit form of a justification based on self-defining values, and such an explicit assessment of consistency is *not* what the DPTR refers to as behavioural consistency. The DPTR explicitly states that one of the strengths of system 2 reasoning is value-consistent justification, as value-consistent justifications reduce possible regret by ensuring a subjectively high quality decision is executed. However, system 2 differs from system 1 in that it views self-consistency as concurrence between behaviour and the values representing our 'chronic' self-concept (i.e., a stable, cross situational self-concept). This view of self-consistency echoes Gawronski and Bodenhausen's (2006) view that cognitive consistency is only attained through the demarcation of explicit self-values and the application of logical principals to ensure that our behaviour reflects such values. I readily acknowledge that this is a fundamental aspect

of systems 2 processing, but as mentioned previously, such a system of thought is impractical for everyday decision-making as it is only employed in the event that system 1 cannot provide an adequate response (e.g., a new situation is encountered for which no exemplar response is evident). I argue that, while system 2 offers the ability to assess consistency between behaviour and a chronic self-concept, we more readily employ the unconscious process of system 1 exemplar responses (which ensure goal-attainment) as a means of enabling consistency with the 'active' self-concept.

Criticism 6: *How does the trichotomising of justifications (e.g.., ego-proximal, ego-distal, and no justifications) provide any advance on the current literature when a more fine-grained analysis of justification may be warranted?*

Given my criticism of previous researchers for their dichotomous quantification of justification this is certainly a potential criticism of the DPTR, and a more fine-grained categorization of justification would be welcomed. However, as suggested by Connolly and Zeelenberg (2002), the concept of justification - from its definition to the basis for its strength - has received relatively little attention. My categorization of justification goes substantially beyond previous research by providing the key anchors underpinning a hierarchy of justifications, and illustrating the mechanisms by which those anchors operate. In this respect, though my categorization may be somewhat simplistic, it represents one of the most substantial steps towards understanding the concept, and use, of individual justifications in the literature to date. The trichotomising of justifications also makes conducting justification research tractable, and if no reliable effects are found with the use of a three-factor approach to justification then a finer grained analysis of the concept may not be feasible.

Summary

The DPTR is a new generation of regret theory which provides greater clarity in the assessment of everyday regret experiences than any current theory of regret. By integrating two key decision-making processes common to everyday decision-making the DPTR allows for the influence of both our fast, intuitive responses and our more laboured, analytical judgements in the generation of regret intensity. The combination of these two

fundamental processes provide for a range of regret not evident in previous theories, and accounts for the variation in regret experiences evident both in previous research and in wider media reports. The DPTR provides the next step in regret assessment and opens a pathway for future regret and emotions research.

CHAPTER 5.
HYPOTHESES

I have questioned the ability of previous theories of regret to explain individual differences in regret intensity and, subsequently, proposed that such differences can be explained within the framework of the DPTR. This provides for a very specific set of hypotheses on which to base an empirical investigation; one set exploring the basis for previous theories and a second exploring the basis for the DPTR.

Evaluating Previous Theories of Regret

Temporality in Action and Inaction Regrets

There are two very influential claims that pervade the regret literature: (1) that action regrets are more regrettable than inaction regrets in the short-term, and (2) that inaction regrets are more regrettable than action regrets in the long-term. As outlined in the previous chapters such claims are questionable on two specific grounds. First, research suggesting a temporal effect for action and inaction regrets has clouded the distinction between the *frequency* (i.e., the number of occurrences) and *intensity* (i.e., the strength of feeling) of regret, so it is unclear whether such an effect exists for regret intensity or whether it only exists for regret frequency. Second, Feldman et al. (1999) found that the temporal effect is only evident for regret frequency, not intensity, and Bonnefon and Zhang (2008) found that action and inaction regrets were of equal intensity in both the short and the long-term. I will test both the frequency and intensity of short and long-term regrets in order to investigate whether (1) a simple action/inaction effect is evident in the frequency and intensity of *both* short and long-term regret, and (2) such an effect – if present – follows the temporal path predicted by Gilovich and Medvec (1994, 1995b). Based on my previous critique of the temporal theory of regret I hypothesise that:

> **H1:** *There will be a greater frequency (i.e., number) of action regrets in the short-term, and inaction regrets in the long-term, but the intensity of action and inaction regrets will be equivalent.*

Age-related Differences in Action and Inaction Regrets

If the temporal theory of regret influences both regret frequency and intensity then specific trends should be evident in age-related analyses of long-term life regrets; namely, that the frequency and intensity of regrets should change dependent on an individual's age. Specific coping mechanisms (e.g., remedial behaviour) are thought to reduce the availability and the seriousness of action regrets over time, while specific cognitive factors (e.g., changes in retrospective self-confidence) are thought to increase the availability and seriousness of inaction regrets over time (see Gilovich & Medvec, 1995b). These processes are enacted over the course of our life span and, therefore, their effectiveness should be age-related (i.e., the longer they are enacted the greater the differentiation between action and inaction regrets). Younger adults should experience equal frequency of action and inaction regrets, while older adults should experience more frequent inaction rather than action regrets. This is because, as compared to older adults, younger adults have had less time to reduce the number of action regrets (i.e., through ongoing remedial work) and enhance the availability of inaction regrets (i.e., through ongoing rumination). Gilovich and Medvec's (1994) own research indicates that such a trend should be apparent. In Study 2 they found 74% of older participants' regrets were for inaction while the proportion was only 61% for younger participants. While this trend did not reach the level of significance they indicated further support for an age-related temporal trend by describing research on a sample of adolescents which showed an even split in the number of action and inaction regrets.

While this age-related trend may be evident for regret frequency, I suggest it will not be evident for regret intensity. Gilovich and Medvec's (1995b) description of the mechanisms underlying the reduction in action regrets over time only provides for the reduction in the *availability* of regrets rather than regret intensity. Specifically, the process of rectification (e.g., apologising) or re-construing (e.g., finding a silver-lining) should only reduce the pool of available action regrets in comparison to the ever expanding pool of inaction regrets (i.e., reduce frequency). The frequency of action regrets will therefore diminish over the course of ones' life in comparison to inaction regrets, but this process should have no effect on the intensity level of the remaining action regrets as they represent actions which no amount of apologising, re-construal or rationalising could resolve. Based on the notion of an age-related temporal trend in regret frequency but not in regret intensity I hypothesise that:

H2: *Younger adults will report equally frequent long-term action and inaction regrets, older adults will report more inactions than actions, but there will be no such age-related differences in the intensity of action and inaction regret.*

Actions and Inaction Regrets by Life Domain

Decisions over education choices are thought to be the most 'regretted' life decision (e.g., Jokisaari, 2004; Kinnier & Metha, 1989; Lecci et al., 1994; Wrosch & Heckhausen 2002), but as with much of the regret literature this research relies on reported frequency rather than intensity ratings of regrets so an analysis of regret intensity across life domains is not possible. Previous research suggests that the life domains generating the most frequent regrets may not inspire regrets of the greatest intensity. Life domains dominated by intimate concepts (e.g., passionate or familial relationships, concerns over interpersonal behaviour) are more strongly associated with our sense of wellbeing than domains concerning objective issues of educational attainment or career advancement (e.g., Glatzer, 1991; Oishi & Diener, 2001). This indicates that intra- and interpersonal issues (e.g., self-confidence concerns, intimate relationships, family, friendships) should generate greater regret intensity than more global issues (e.g., educational attainment, career choices). This notion is supported by Wrosch and Heckhausen (1992) who showed that regrets involving 'family-partnership' issues were positively correlated with regret intensity, while regrets involving 'work-education' issues were unrelated to regret intensity.

To date no one has explicitly compared the pattern of regret frequency and intensity across life domains. If Gilovich and Medvec's (1994) claim is correct then within each life domain actions will be more numerous in the short-term but inactions in the long-term. Likewise the intensity of regrets should fit the same profile such that action regrets will be more intense in the short-term but inaction more intense in the long-term. But if the temporal theory does not hold for regret intensity, as I predict, the most frequent regrets will not be the most intense and intensity of regret will reflect the operation of an alternative factor, such as the intimate nature of the life domain within which the decision occurred. I propose two analyses based on exploring such differences which (1) test whether the temporal effect for action and inaction regrets is evident *within* each life domain, and (2) explore which life domains generate the most frequent, and which generate the most intense, regrets. Results from each of these analyses would help to

firmly disentangle the concepts of regret frequency and intensity. Based on previous research and supporting theory I hypothesise that:

H3: *Within each life domain there will be a greater frequency (i.e., number) of action regrets in the short-term, and inaction regrets in the long-term, but the intensity of action and inaction regrets will be equivalent.*

H4: *The most frequent regrets will occur in life domains characterised as non-intra/interpersonal, but the most intense regrets will occur in life domains characterised as intra/interpersonal, such as intimate relationships, self, and family.*

Evaluating the DPTR

Decision-Orientation

The decision-orientation as outlined by DPTR is a new concept and no empirical data therefore supports its existence. The literature does however support the notion that individuals have an orienting guide too steer decision-making behaviour (e.g., Berzonsky, 1989; Burnett, 1991; D'Zurilla & Goldfried, 1971; Gaus, 1990; Jones & Gerard, 1967). Research also shows that a lack of 'fit' between one's orientation and subsequent behaviour produces negative affect to (e.g., Higgins, 2000). These results in combination indicate that a key factor in the generation of negative affect is the selection of orientation consistent or inconsistent options, and that inconsistency should be linked to greater regret for a poor decision. I hypothesise that:

H5: *Regret intensity will be greater for orientation-inconsistent decisions than for orientation-consistent decisions.*

A key theoretical assumption in the DPTR is that orientation-consistent and orientation-inconsistent decisions produce different levels of regret because the former is reflective of our self-concept while the latter is not. If this is correct then subjective feelings of responsibility for a poor outcome should also vary between two. Because orientation-consistent decisions are the intuitively correct option they will reflect *lower* levels of responsibility for a poor outcome as there was little more one could do to reduce regret, while orientation-inconsistent decisions should engender greater responsibility because

they represent the intuitively incorrect option and there was obviously more we could have done to prevent the poor result. I hypothesise that:

H6: *Feelings of responsibility for the poor outcome will be greater for orientation-inconsistent decisions than for orientation-consistent decisions.*

A last question regarding the nature of decision-orientation is whether it is truly situation-specific, as theorised in the DPTR, or whether it merely reflects a cross-situational preference for consistency in behaviour. Some suggest that humans have a desire for relatively consistent cross-situational behaviour (e.g., Cialdini, Trost & Newsome, 1995), while others suggest human behaviour is consistent to the extent that similar situations evoke similar responses but true cross-situational inflexibility is un-adaptive (e.g., Shoda & Mischel, 2000). The DPTR bases itself within the latter camp, and proposes that our intuitive decision-orientation is a subset of our global self-concept, activated by the situational constraints of the decision at hand, and there to help us make goal-satisfying decisions. A decision-orientation should therefore not be related to a general preference for cross-situational consistency. I hypothesise that:

H7: *Decision-orientation will influence regret intensity irrespective of individual preference for consistency.*

Decision-Justification

Previous research (e.g., Connolly & Zeelenberg, 2002) suggests that the presence of a justification reduces regret, and subsequent research supports this (e.g., Pieters & Zeelenberg, 2005). The trichotomisation of justification types in the DPTR (i.e., ego-proximal, ego-distal, and no justification) is an untested expansion of this concept, though the ego-proximal/ego-distal distinction is in keeping with the general notion of a continuum of justifications highlighted in the literature. Empirical testing is required in order to ascertain whether ego-proximal justifications are considered subjectively stronger than ego-distal justifications, and whether a difference in their use has an impact on regret intensity. Based on empirical evidence of justifications impact on regret, and on theoretical support for the trichotomisation of justification types, I hypothesise that:

H8: *Ego-proximal justifications will be considered subjectively stronger than ego-distal justifications.*

H9: *Regret intensity will be lower for ego-proximal justifications than for ego-distal justifications, and lower in turn for ego-distal justifications than for no justification.*

H10: *Regret intensity will be lower for justified decisions (ego-proximal and ego-distal combined) than for unjustified decisions.*

The Independence of Orientation and Justification Processes

The DPTR explicitly notes that the values underpinning system 2 justifications will, after repeated confirmation of their worth, generate situation-specific goals and subsequent exemplar responses designed to attain these goals. There should therefore be an association between types of justification used and whether the decision is orientation consistent or not. However, as also noted in chapter 4, not all decisions entail compatibility between orientation and justification and such incompatibility will then generate regret. Any association between orientation type and justification level should therefore be relatively small, and the two processes will effectively influence regret intensity independently of one another. I hypothesise that:

H11: *Decision-orientation and decision-justification will be associated with each other but the association will be statistically small.*

H12: *Decision-orientation and decision-justification will both be statistically associated with regret intensity, and this association will be independent of one another.*

Related Measures of Regret Intensity

As a form of concurrent validity for our regret intensity measure I aim to explore whether decision-orientation and decision-justification processes generate changes in regret-related emotions. Gilovich, Medvec, and Kahneman (1998) showed that regrets can be classified as to whether they invoke 'hot' emotions (e.g., anger, irritation), 'wistful' emotions (e.g. contemplation, nostalgia), or 'despair' emotions (e.g., empty, longing). They showed that hot emotions were more likely to be felt for regrets of action while wistful and despair emotions were prompted more often by regrets of inaction, and that endorsement of wistful emotions was more common for long-term rather than short-term regrets. This indicates that hot emotions essentially mimic the pattern of regret intensity for action

regrets, while wistful and despair emotions mimic the pattern of regret intensity seen for inaction regrets.

Gilovich et al.'s (1998) results could be interpreted through the DPTR to show that two very specific decision-making processes might underlie these emotional reactions, and that this differentiation could be a result of a dual process system of thought. Specifically, hot emotions (e.g., anger, irritation) more likely result from an immediate phenomenological (i.e., gut) reaction to orientation-inconsistency than consistency, so hot emotional reactions are 'gut reactions' to overriding our instinctive decision preference and thus making what obviously feels like a 'wrong' decision. For instance, anger is associated with negatively-valenced events (Lerner & Keltner, 2000) and a poor outcome resulting from inconsistent behaviour (which has a negative valence) should invoke greater anger than a poor outcome resulting from positively valenced behaviour. Conversely, wistful and despair emotions (e.g., contemplation, longing) require an explicitly analytical review of our justification, the consideration of possible outcomes foregone, and contemplation of possible futures. I predict that the lower the level of justification for a decision the greater the level of endorsement of wistful and despair emotions, because the poorer our judgement (i.e., the lower the justification) the greater the room to question our wisdom and ponder on the possibilities of having made another – possibly better – choice. I hypothesise that:

H13: *Orientation-inconsistent decisions will generate greater levels of hot emotion that orientation-consistent decisions.*

H14: *Ego-distal justifications will generate greater levels of wistful and despair emotions than ego-proximal justifications, and unjustified decisions will generate greater levels of wistful and despair emotions than decisions with a justification (either ego-proximal or ego-distal).*

Assessing the DPTR Model

The key question for this thesis is whether the two processes of decision-orientation and decision-justification in combination will show the graded levels of regret set out in the DPTR model. DPTR predicts that the combination of decision-orientation and decision-justification processes will lead to a specific order of regret intensity such that self-consistent decisions with the strongest justification will experience the lowest levels of

regret and a reduction in justification and orientation consistency will generate increased levels of regret. I hypothesise that:

H15: *Regret intensity will conform to the pathways predicted by the DPTR model, such that the lowest intensity will be for orientation-consistent decisions that have ego-proximal justifications, and the highest will be for orientation-inconsistent decisions lacking any form of justification.*

Lastly, I will explore whether the regret intensity trends predicted by DPTR are evident for both action and inaction regrets. The distinction between action and inaction regrets has been a consistent theme throughout the regret literature and has shaped many theories of regret. But the DPTR model was designed as a comprehensive model of all human decision-making, and to confirm this is the case requires that I show the predicted DPTR trends are evident irrespective of whether the decision in question was for action or inaction. I therefore hypothesise that:

H16: *The regret intensity trends predicted by the DPTR will still be evident when the intensity of action and inaction regrets are analysed separately.*

CHAPTER 6.
METHOD

Postal survey methodology was used to test the current hypotheses on the real-life regrets of community dwelling individuals. The following chapter provides a description of the study questionnaire, its pilot testing, changes made based on pilot study feedback, and its implementation in the main study.

Proposed Questionnaire Content

Regret

In order to test whether DPTR predictions held for regrets across the life span, participants were asked to describe in writing both their greatest regret from the past 6 months (i.e., a short-term regret), and the single greatest regret from their entire life-time (i.e., a long-term regret). Previous regret research has defined 'short-term' variously as from the last week (e.g., Gilovich & Medvec, 1994), to within the last three months (e.g., Wrosch & Heckhausen, 2002), to within the last year (e.g., Bonnefon & Zhang, 2008), but the current definition of 'short-term' as falling within the last six months was chosen for three specific reasons. First, the time-frames for 'short-term' regrets used in previous research have had no practical or theoretical rationale, so the limited time spans used in that research are essentially arbitrary. Second, when contrasted with a person's normal life expectancy, common usage of the term 'short-term' implies a period of time up to a year, as evidenced in studies on romantic relationships (e.g., MacDonald & Ross, 1999), employment (e.g., Burgess, Campbell, & May, 2008), financial investments (e.g., Mishkin, 1991), criminal convictions (e.g., Lewis et al., 2003), and health intervention follow-ups (e.g., Fowler-Brown & Kahwati, 2004; Tommiska et al., 2001). Thirdly, events with significant personal consequences are a prerequisite for regret generation, but little of practical significance may actually occur for individuals over the course of two weeks. This would result in the short-term regrets nominated being potentially innocuous or even trivial, and would likely skew 'short-term' intensity towards the lower end of the intensity scale. Comparison of such trivial regrets would not provide a very good test of the DPTR. A six month time-frame therefore falls in the middle of the commonly acknowledged 'short-term' period, covers a period long enough to include decisions of importance to the individual, but it is not so long as to provide an indication of the potential long-term consequences.

Participants responded in the first section of the survey to questions regarding their short-term regret, and the same questions were repeated in the second section of the survey but with reference this time to their long-term regret. These questions are illustrated below.

Measures of Regret Intensity

In addition to confusing regret frequency with regret intensity, a further critique I have made of previous measures of regret (e.g., Gilovich & Medvec, 1994: Study 5) is that they may also inadvertently cloud the distinction between emotional intensity and alternative measures such as the degree of impact on current life goals or simple prominence in thought. The concepts of emotional intensity, level of thought, and perceived life impact are undoubtedly intertwined in regret research. As a rule regrets must impact on our lives to some degree (otherwise they would not be regrettable!) and counterfactual thoughts and pondering of lost possibilities are necessary components of the regret experience. It is important to include measures of all three concepts in order to ascertain whether a combined indicator would be a better measure overall regret intensity, or, whether the three are sufficiently independent of each other to warrant referring only to the emotional intensity measure.

Participants were asked to indicate on a 5-point Likert scale, with three anchors, how much impact they thought the regret had had on their lives in general (1 = *No impact*, 3 = *A moderate impact*, 5 = *A very large impact*). They also indicated on a 5-point Likert scale, with three anchors, how often they thought about the regret (1 = *Less than once a week*, 3 = *Every other day*, 5 = *More than once a day*). Finally, participants indicated on a 5-point Likert scale, with three anchors, how intense their feelings of regret were (1 = *I don't regret it much*, 3 = *I regret it somewhat*, 5 = *I regret it a lot*). All three scale and anchors were developed by the author.

Measures of Regret-Related Emotions

Participants were asked to indicate how much this regret prompted each of 15 regret-related emotions, described by Gilovich et al. (1998) as reflecting three specific emotion-sets; *hot* (angry, disgusted, embarrassed, guilty, irritated), *wistful* (contemplative, dreamy, nostalgic, sentimental, wistful), and *despair* (empty, helpless, longing, sad, unfulfilled).

Participants described how often they experienced each emotion when thinking about their regret on a 5-point Likert scale with 5 anchors (1 = *Never*, 2 = *Sometimes*, 3 = *Occasionally*, 4 = *Often*, 5 = *Always*). The scores for each emotion are summed to create an intensity score for each emotion-set. The total possible range of scores for any emotion set is from a low of 5 (very low intensity) to a high of 25 (very high intensity).

Time Since Regrettable Decision

Participants were asked to indicate how far in the past the regrettable decision had occurred. The short-term regret section requested the approximate number of months and weeks that had elapsed since the decision, while the long-term regret section requested the approximate number of years and months that had elapsed since the decision. For both short and long-term regrets the results were converted into weeks (e.g., 3 months and 1 week would equal 13 weeks) to provide a continuous measure for direct comparison with other scale scores.

Responsibility

In order to ascertain the level or responsibility for each decision participants were prompted to think back to the regrettable event and contemplate all the information that went through their minds prior to the decision. They were then asked to indicate how responsible they felt for this event or decision on a 5-point Likert scale with three anchors (1 = *Not responsible*, 3 = *Somewhat responsible*, 5 = *Completely responsible*).

Decision-Justification

Participants were asked to indicate how justified they thought the decision or event (which led to their regret) was at the time it occurred, responding on a 5-point Likert scale with 3 anchors (1 = *Not justified*, 3 = *Somewhat justified*, 5 = *Completely justified*). Those responding with a '1' on the scale formed the 'no justification' group used in further analysis, while those responding from 2 to 5 on this scale (i.e., they had some form of justification for their decisions) were asked to complete two further questions regarding their justification. First, in order to ascertain the subjective strength of their justification they were asked the following: 'Looking back on it, how strong do you think this justification is now?' Participants responded on a 5-point Likert scale with 3 anchors (1 = *A*

weak justification, 3 = *A moderate justification*, 5 = *A strong justification*). Second, in order to ascertain whether the justification they relied on was ego-proximal or ego-distal in origin participants were asked to read a small passage providing a layperson's distinction of the two concepts. Specifically, the term 'personal beliefs' was used as a proxy for ego-proximal justifications, and the term 'situational factors' was used as a proxy for ego-distal justifications as they were considered readily understandable translations of the terms in question. The participants read the following description:

> *'There are many reasons that we decide to do something, or not do something, that we later end up regretting. For instance, we may justify our actions or inactions in the following ways:*
>
> - *Personal Beliefs – we believe it was right at the time*
> - *Situational Factors – some other reason compels us to do it (e.g., our friends told us it was a good thing)*
>
> *When you think about how you justified your action or inaction, what do you feel your justification was more consistent with?'*

Participants responded by circling the appropriate number on a 5-point Likert scale with 3 anchors (1 = *Personal beliefs*, 3 = *equally personal and situational factors*, 5 = *Situational factors*). Responses to options 1 and 2 were combined to create the 'ego-proximal' justification category and responses to options 4 and 5 were combined to create the ego-distal justification category. Responses to option 3 were excluded from further analysis as they could not be distinguished as ego-proximal or ego-distal and could not therefore proceed in an evaluation of the DPTR model.

Decision-Orientation

Decision-orientation is quantified in this study as consistency with the situation-specific, self-concept relevant, personal rules which participants refer to in order to make everyday decisions. Consistency with decision-orientation is measured by whether the decision in question contradicts or does not contradict these personal life rules. In the DPTR the decision-orientation is a fast and implicit process and measurement of this process becomes an issue as this survey is a *post-hoc* evaluation of life regrets, which excludes the possibility of real-time analysis of these implicit decision-guides. The problem was how to

effectively elicit the situation-specific decision-orientation which itself was derived from the phenomenological experience surrounding the decision-situation.

I attempted to resolve this problem by placing the decision-orientation question last in the section so participants were required to describe their regret and work through other questions concerning the decision first. This should have provided enough memory-induced cues to activate some from of the phenomenological experience related to this decision and, therefore, potentially trigger the decision-orientation pertinent to this decision. The rationale for this procedure stems from the literature outlining the link between autobiographical memory retrieval and its associated activation of the feeling state coupled with this memory. The exemplar responses proposed in the DPTR are activated by the somatic markers associated with specific situations and experiences (see Chapter 4 for a description of this process). Conway (2001) claims that 're-experiencing' such sensory and somatic experiences is central components of autobiographical memory retrieval, and recent neuro-imaging studies indicate that activation of the prefrontal cortex is central to the retrieval of these somatic and sensory experiences in autobiographical memory (see Botzung, Denkova, & Manning, 2008; Conway, Pleydell-Pearce, & Whitecross, 2001; Schacter, Addis, & Buckner, 2008). The prefrontal cortex is also the neurological centre crucial for the somatic marking of exemplar responses in DPTR. I argue that the process of autobiographical memory retrieval should also prompt the phenomenological experience of the regrettable episode through activation of the prefrontal cortex. This in turn should make salient the exemplar responses, or at least the phenomenological experience underpinning these exemplar responses, associated with the original decision context and provide the participant with an indication of the decision-orientation relevant to the decision in question.

To induce thought about their self-concept and any life rule or beliefs pertinent to the decision making context from which their regret arose, each participant read a brief statement introducing the notion of personal life rules. The statement read:

'Some people have personal rules, or life philosophies, that often help guide what they do. For example, some people believe that you should always think of family needs before your own, or some think that the most important thing in life is to be nice to people. Take a minute to think about what some of your

most important personal rules are. What rules help guide your decision-making?

Try to choose what you believe are some of your most important personal rules. Now that you have them in mind, compare them to the decision or event that you regret. Do you feel that the decision you made or event you experienced contradicts any of your personal rules'

Participants responded by circling a number on a 5-point Likert scale with two anchors (1 = *No it does not*, 5 = Y*es it does*), indicating the degree to which they felt the decision or event contradicted their personal rules. Respondents to options 1 and 2 were combined to create the 'orientation-consistent' category and respondents to options 4 and 5 were combined to create the 'orientation inconsistent' category. Respondents to option 3 were excluded from further analysis as they could not be distinguished as either orientation consistent or inconsistent and could not therefore proceed in an evaluation of the DPTR model.

Additional Measures

In addition to the regret-specific measures mentioned, all participants also completed the following psychosocial and demographic measures:

Cross-situational consistency.　　　　The *Preference for Consistency – Brief Scale* (PFC-B: Cialdini et al., 1995) is a 9-item scale measuring the tendency for people to respond to a variety of situations in a highly predictable, consistent, and stable manner, and to prefer such behaviour in close others. Example items include "I typically prefer to do things the same way", and "I make an effort to appear consistent to others". The original PFC-B was scored on a 9-point Likert scale, but a clerical error in the formatting of the scale for both the pilot and the main study resulted in the use of 5-point Likert scale. Participants indicated the degree to which they agreed to each of the 9 statements on a 5-point Likert scale with 5 anchors (1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Neither disagree or agree*, 4 = *Agree*, 5 = *Strongly agree*). When the single negatively worded item was reverse scored all item scores were summed to create a possible consistency scale range of 9-45, with higher scores indicating greater preference for consistency.

Cialdini et al. (1995) report good internal reliability (α = .84) and a high correlation (r = .95) for the PFC-B (scored on the original 9-point Likert scale) with the 18-item full version of the scale, and Newby-Clark, McGregor, & Zanna (2002) report a similar internal reliability score (α = .86). The internal reliability coefficient for the PFC-B in the pilot and the main study were .80 and .87 respectively, closely reflecting both Cialdini et al. and Newby-Clark et al., and illustrating that internal reliability was not aversely influenced by the change in scale format.

Demographic information.   Participants were also asked to indicate their gender, age, ethnicity, highest educational qualification, and working status in order to assess whether demographic factors had any significant influence on the presence or expression of regret.

Request for a Summary of the Results

A one-page 'request for feedback' form was attached at the end of the questionnaire, and outlined participants' rights to feedback on the study results and the expected study completion date. Participants were instructed to print their names and contact postal addresses clearly, to detach the form from the questionnaire, and seal it in the attached letter-sized free-post return envelope addressed to the author at his university address. This ensured that the summary request forms were received separately from the participants' questionnaires, and further assured anonymity of participant responses.

Ethical Concerns Addressed

Three steps were undertaken to ensure this questionnaire presented no ethical concerns prior to piloting-testing. First, copies of a draft questionnaire were assessed by 10 colleagues in the School of Psychology at Massey University (comprising both lecturing staff and PhD students) who were all experienced in survey research methodology. They screened for appropriateness of questionnaire content and question wording to ensure it was unlikely to cause offense to participants; this screening raised no ethical concerns. Second, an advisory note was included with the questionnaire for any participants in the study for whom detailing their very intimate and personal regrettable experiences might prompt mental health or emotional concerns. This document outlined information on, and points of access to, the national psychological, counselling and lay-support services available to them should they wish to discuss their experience further. Third, ethical

approval to undertake this study was granted by the Massey University Human Ethics Committee (HEC: PN Application 04/37). Confirmation of this ethical approval and of the primary avenue for complaint regarding the study was detailed on the information sheet which constituted the first two pages of the questionnaire.

The Pilot Study

A pilot study was undertaken to assess the general public's comprehension of the questions and to test the utility of the questionnaire in eliciting appropriate responses. A pilot sample was sought which contained a range of participants from different occupations, localities and ages (i.e., one not limited to undergraduate university students) in order to provide a robust test of the questionnaire.

Participants

Thirty-two participants completed the pilot questionnaire, and they represented a non-probability convenience sample recruited through several acquaintance networks of the author. Twenty-one were females and 11 were males, ranging in age from 20 to 72 (*M* = 41), and the majority were of European or New Zealand European ethnic descent (81%). Approximately 47% had at least a university level education, 19% had trade or professional certificates, 28% had some level of secondary education, and 6% had neither school nor trade qualifications. Lastly, 78% were either full or part-time employed while the remainder were students (9%), retired (3%), homemakers (3%) or categorised as 'Other'.

Procedure

To ensure anonymity of responses, 6 individuals known to the author were independently asked to recruit participants for the pilot study. They provided the participants with the pilot questionnaire and associated free-post return envelopes addressed to the author at his university work address. They instructed the participants to complete the questionnaire in their own time and to indicate on the questionnaire if any of the questions were too hard to answer or understand and the reason why (e.g., 'The wording was difficult to follow', or, 'I didn't understand the question'). Completed questionnaires were then posted to the

author with no identifying names or addresses attached. Questionnaire responses were analysed using SPSS data analysis software.

Pilot Study Results and Subsequent Changes to the Questionnaire

Approximately 75% of the pilot participants had a short-term regret and 81% had a long-term regret. No significant demographic differences were observed between those with regrets and those not reporting regrets. Of those with regrets, there was no significant association between regret intensity and demographic factors such as age or gender (too few respondents were available to analyse regret intensity by ethnicity or educational attainment). Feedback from pilot participants indicated a high level of question comprehension and no ethical concerns regarding the question content. Subsequent to a frequency analysis of the item responses, three changes were deemed necessary to the questionnaire prior to its use in the main study:

1. The 5-point Likert scale measuring regret intensity showed potential ceiling effects, with 84% of the short-term regrets and 92% of the long-term regrets scoring on the upper half of the scale. This is not surprising considering the focus of the survey is participants' most regrettable life events, and responses are likely to be skewed towards the upper end of the intensity scale. This ceiling effect will however hamper assessment of differences in regret intensity across DPTR groups because it reduces the potential variability of intensity scores. As a solution, the 5-point scale was increased to a 9-point scale with 5 specific anchors (1 = *I don't regret it much*, 3 = *I regret it somewhat*, 5 = *I regret it quite a bit*, 7 = *I regret it a lot*, 9 = *I regret it immensely*) in order to increase the potential distribution of responses at the upper end of the scale.

2. In the scale used to categorize participants' justifications 22% of short-term and 34% of long-term regrets were for the mid-point response (i.e., *equally personal and situational factors*) and would therefore have been lost to analysis for assessment of PDTR group responses. The scale was therefore converted to a response 4-point response scale by removing the mid-point response category. This resulted in a 'forced choice' response format where the first two response choices combined to form the ego-proximal justifications category and the latter two combined to form the ego-distal justification category. One of the primary concerns

about the use of forced-choice response sets is the influence of social desirability on eventual response choice (see Robinson, Shaver, & Wrightsman, 1991). However, social desirability bias will not be a concern for the current question because; (a) social desirability entails an *a priori* ranking of the different response choices and the response choices have no particular social valence (i.e., positivity, negativity) in this context, and (b) the response options have been worded in such a manner as to maintain neutral valence.

3. In a similar manner to the justification scale above, use of the 5-point scale for indicating consistency with decision-orientation revealed significant use of the mid-point response option; 23% of participants' short-term regrets and 30% of participants' long-term regrets. In order to reduce the number of participants excluded from further analysis the original 5-point scale was reduced to a forced-choice, dual-option indicator which still used the same anchors; 'No it does not' and 'Yes it does'.

The final questionnaire with full item wording is provided in Appendix C.

The Main Study

Participants

Three thousand (3,000) people aged 18 and over were randomly selected from the New Zealand electoral roll and invited to participate in the current study[1]. Six hundred and seventy-seven (677) consented to participate by completing and returning the postal questionnaire; a response rate of 23%. Of the 677 questionnaires returned 24 were insufficiently completed (i.e., their information was not practically useful) and were dropped from further analysis leaving a total of 653 respondents with usable data.

While there is no agreed upon normative response rate (Baruch, 1999), the response rate for this study is in line with expectation as Kerlinger (1986) suggests that mail surveys should commonly expect returns of less than 40%, and the sensitivity of the current

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[1] Registration on the electoral roll is compulsory for all New Zealanders of eligible voting age (i.e., 18 years and over), and coverage currently stands at 95% of the adult general population (Electoral Enrolment Centre, 2005). The electoral roll therefore provides an efficient sampling frame from which to take a random sample of the adult population resident in New Zealand.

topic was expected to reduce this expectation even further (see Edwards et al., 2002). Assuming a one-tailed α of .05 (as we have directional hypotheses), the conventional power level of .8, and expecting relatively small effect sizes (e.g., .28) as I am looking at the *most* regrettable decisions in participants lives so intensity levels for all groups are likely to be skewed towards the top end of the scale, the minimum cell size to detect expected effects is 76 (see Kramer & Thiemann, 1987). Multiplying 76 by 6 (the number of groups in the DPTR) indicates that approximately 456 respondents are required for the total sample so our response rate is more than adequate.

Of the 653 respondents with viable data, 65% were female, and ages ranged from 18 to 87 years old (M = 48, SD = 16). The majority (approximately 82%) were of European or New Zealand European descent, 6% were of Māori descent, both Pacific Island and Asian descendents constituted 3% respectively, and the remainder indicated they were of 'Other' ethnic descent. Approximately 17% of the participants had no educational qualifications, while 31% had some form of secondary school qualification, 23% had a trade or professional qualification, and 28% had university undergraduate or postgraduate qualifications. Approximately 60% were working either part or full-time, 18% were partially or fully retired, 9% were homemakers, 6% were students, 1% was unemployed, and the work status of the remainder was listed as 'Other'.

Of the 653 participants, 409 had a short-term regret and 499 had a long-term regret. Specifically, 58% had *both* a short and long-term regret, 4% had only a short-term regret, 18% had only a long-term regret, and 20% had no regrets at all. Analysis of variance (ANOVA) reveals that these four 'regret' groups significantly differed in age, F (3, 639) = 19.11, $p<$ .001. Tukey's post-hoc tests reveals that participants in the 'short and long-term regret' group were younger (M = 45) than those in the 'no regret' group (M = 53) and the 'only long-term regret' group (M = 55). Those in the 'only short-term regret' group (M = 45) were also significantly younger than those in the 'only long-term regret' group. This indicates that the presence of a short-term regret may be associated with youth, and that long-term regrets are more likely to be the concern of old(er) people.

Further analysis of demographic differences reveals a significant association between group membership and gender, χ^2 (3, 645) = 10.18, $p<$ .02), such that 26% of men have no regrets compared to only 16% of women, while women are more likely than men to have both short and long-term regrets (62% vs. 51% respectively). Chi-square analysis of differences in ethnicity, educational attainment, and work status across the 4 regret groups

is inappropriate due to insufficient numbers in each cell. However, cell proportions indicate that European/New Zealand European and Asian participants are more likely to report having no regrets than Māori and Pacific Island participants, who in turn are more likely than the former groups to report having both short-and long-term regrets. The only notable association between regret group membership and educational qualifications is that 62% of participants with an undergraduate or postgraduate qualification were likely to report both a short and long-term regret, compared to only 54% of participants with a secondary qualification. Lastly, 30% of retirees (partly/completely retired) had no regrets as compared to only 17% of those currently working, and conversely, 63% of workers reported both a short-and long-term regret as opposed to only 34% of retirees.

Method and Procedure

A three-stage postal survey process was used in order to increase potential response rates. Based on Dillman's (2000) multi-stage 'Tailored Design Method', the three stages in the current study consisted of (1) an initial letter of invitation to participate, (2) the postal questionnaire, and (3) a reminder postcard. Once the 3,000 participants had been randomly selected from the electoral roll, via electronic random sampling techniques, an initial letter of invitation to participate in the study was sent (see Appendix A). This introduced the researcher, outlined the nature study, provided the researcher's contact details in the event that more information was needed, and indicated that the questionnaire would be sent the following week. The second posting stage occurred one week after the letter of invitation and included 4 specific components:

1. A second letter of introduction (see Appendix B) which reiterated the nature of the survey and the contact details of the researcher, and highlighted the random selection method used and the participants' right not to participate.

2. The study questionnaire (see Appendix C), the first two pages of which constituted a comprehensive information sheet on the study. Specifically it reiterated the information on the letter, indicated what the questionnaire completion entailed, outlined their rights as participants, ensured participant anonymity and confidentiality of responses, and detailed confirmation of approval by the Massey University ethics committee.

3. An advisory note (see Appendix D) outlining information on, and points of access to, the national psychological, counselling and lay-support services available to participants in the event that completing the questionnaire raises issues they might wish to discuss with knowledgeable and professional support people.

4. Two free-post return envelopes; the first for returning the completed questionnaire, and the second for returning a request form for a summary of the study results. Both envelopes were addressed to the primary researcher at the School of Psychology address at Massey University.

The third posting stage occurred two weeks after the posting of the questionnaire. This constituted a postcard (see Appendix E) sent to all participants thanking those who had returned their questionnaires, and letting those that had not returned a questionnaire know that their responses were still welcomed and replacement questionnaires were available in the event the original had been lost.

Participants' open-ended responses regarding their short and long-term regrets underwent third-party coding to ascertain whether the regret involved action or inaction, and which life domain the regret reflected. Two independent coders, blind to the nature of the research, were asked to code each regret as reflecting either (1) an action, (2) an inaction, or (3) indeterminate. Inter-rater reliability for the short-term regrets (Kappa = .88, $p < .001$), and for the long-term regrets (Kappa = .81, $p < .001$), were both excellent (see Landis & Koch, 1977). Any inter-rater disagreement was settled by the judgement of the primary researcher. Two further independent coders, also blind to the nature of the research, separately coded each regret as reflecting 1 of 13 life domains (see Table 3). Once more inter-rater reliability for the coding of short-term regrets (Kappa = .86, $p < .001$) and for the coding of long-term regrets (Kappa = .87, $p < .001$), was excellent (see Landis & Koch, 1977). Any inter-rater disagreement was settled by the judgement of the primary researcher.

Table 3

Description of the life domains used to categorise regrets

Life Domain	Regret content
Education	School, university, studying, getting good grades, and subject selection.
Occupation	Employment, earning a living, career choices, and relationships at work.
Finance	Money, investments, and purchases.
Intimate relationships	Love, dating, marriage, sex, and interactions with partners.
Family	Interactions with parents, siblings, and extended family.
Parenting	Interactions with your children.
Friendships	Interactions with friends.
Health and Self-care	Exercise, physical activity, diets, avoiding/treating illnesses, and physical injuries.
Leisure	Recreation, hobbies, and sports.
Travel/moving	Travel, moving home, and relocating.
Self	Satisfaction/disappointment with personal attitudes, behaviours, or abilities.
Dual categories	Two or more of the other categories combined.
Other	Something other than the categories described.

These categories are based on a meta-analysis of life-domains revealed in previous regret research (see Roese & Summerville, 2005). However, they are altered slightly from the original categories due to information gleaned from the pilot study responses, and, a brief review of the open-ended responses in the main study which highlighted commonly recurring themes not covered by the original categories. Specifically, the category 'Travel/moving' was included as travel-specific regrets were evident in the pilot study, and 'dual categories' was included because some of the regrets in both the pilot and main studies defied attempts to categorise them within a single theme. Furthermore, the categories 'Community' and 'Spirituality' which occurred in Roese and Summerville's (2005) meta-analysis were dropped as neither was evident in the pilot study responses and few of the responses in the main study reflected these themes.

CHAPTER 7.
RESULTS - SHORT-TERM REGRETS

The analysis of results in the following sections (Chapters 7 and 8) will include specific reference to the stated hypotheses (as outlined in Chapter 5). Hypotheses will appear prior to the relevant analysis in each sub-section (though not necessarily in numerical order). They will be in italic font and headed with the appropriate hypothesis number (as in Chapter 5) so as to clearly distinguish them from the surrounding text. This supports comprehension of each of the analyses, reduces the need for constant reference back to the hypotheses section, and therefore increases the pace of the narrative.

Assessing Regret Frequency and Intensity

Four hundred and seven (407) participants had a short-term regret; 212 were for inaction, 189 for actions, and 6 indeterminate[1]. Table 4 presents the frequency and intensity of short-term action and inaction regrets overall, by gender, and by age group. The intensity measures include the direct measure of intensity and supplementary measures targeting thought about the event and perceived life impact of the event. Participants were split into three age groups[2] (i.e., younger, middle-aged, and older adults) whose group labels and associated age cut-offs reflect those used in other age-related surveys of regret (e.g., Kinner & Metha, 1989). Younger adults were aged 18-39 years old (M = 30, n = 144), middle-aged adults were 40-59 years old (M = 49, n = 186) and older adults were 60 years old and over (M = 67, n = 64).

H1:	*There will be a greater frequency (i.e., number) of action regrets in the short-term but the intensity of action and inaction regrets will be equivalent.*

No significant difference was found in the frequency of action and inaction regrets overall or by age-group, but there was a small and statistically significant gender effect; men were more likely to report regrets of action while women reported more regrets of inaction, χ^2 (1, 395) = 4.69, p = .030, ϕ = .11. Taking into account the limited size of the gender effect

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[1] From this point forward all analyses specifically comparing regret frequency with regret intensity will disregard 'indeterminate' regrets.

[2] While variability compression is an acknowledged outcome of trichotomising a scale variable this was done because (1) there were no underlying associations between the three intensity measures and age as a scale variable, and (2) trichotomising provides the reader a clearer distinction between the age groups of interest and of the age brackets where differences were hypothesised to exist.

these results suggest that short-term regrets of action and inaction occurred *equally* frequently for all.

Analysis of regret intensity levels shows that there was no statistically significant difference in the intensity of action and inaction regrets overall, or by age group. There was an unexpected interaction effect between gender and regret type; men's and women's action regrets were equally intense, but women's inaction regrets were significantly more intense than men's, t (205) = 2.96, p = .003, d = 0.46. In addition to regret intensity, the levels of thought about the decision and the perceived life impact of action and inaction regrets were also explored. There was no difference in these measure overall or by age group but levels of thought about the event did show a gender effect; regrets of inaction prompted greater levels of thought about the decision for women than for men, t (205) = 2.35, p = .020, d = .38. These results indicate that inaction regrets are more intense and prompt more thought about the decision for women than for men.

Table 4

Frequency and three measures of intensity for short-term action and inaction regrets overall, by gender and by age group.

| | Three measures of Regret Intensity | | | | | | | |
| | Frequency[c] | | Intensity[d] | | Thought[d] | | Impact[d] | |
	Action regrets	Inaction regrets	Action regrets	Inaction regrets	Action regrets	Inaction regrets	Action regrets	Inaction regrets
Overall	189 (47%)	212 (53%)	5.46 (2.25)	5.27 (2.24)	2.78 (1.40)	2.70 (1.41)	3.26 (1.11)	3.22 (1.18)
Gender[a]								
Male	67 (56%)	53 (44%)	5.12 (2.18)	4.51 (2.40)	2.82 (1.39)	2.32 (1.38)	3.13 (1.14)	3.08 (1.25)
Female	121 (44%)	154 (56%)	5.66 (2.28)	5.55 (2.13)	2.75 (1.42)	2.84 (1.41)	3.35 (1.09)	3.28 (1.16)
Age[b]								
Younger adult	65 (45%)	79 (55%)	5.14 (2.34)	5.23 (2.17)	2.74 (1.41)	2.87 (1.44)	3.20 (1.00)	3.23 (1.24)
Middle-aged adult	90 (48%)	96 (52%)	5.76 (2.27)	5.19 (2.31)	2.98 (1.44)	2.72 (1.42)	3.39 (1.20)	3.17 (1.16)
Older adult	32 (50%)	32 (50%)	5.28 (2.00)	5.69 (2.25)	2.28 (1.25)	2.28 (1.26)	3.13 (1.07)	3.41 (1.13)

Note. Regret intensity scale ranges from 1-9; Thought and Impact scales both range from 1-5.
[a] Four participants did not indicate their gender; [b] Five participants did not indicate their age; [c] Row proportion appears in parentheses;
[d] Standard deviation appears in parentheses.

H3:   *Within each life domain there will be a greater frequency (i.e., number) of action regrets in the short-term but the intensity of action and inaction regrets will be equivalent.*

Figure 5.   Graph showing the frequency of short-term action and inaction regrets across life domains

Figure 5 shows the frequency of action and inaction regrets within each of the 13 life domains, and the trends indicate that life domain may dictate whether action or inaction is the more frequent regret. Chi-square analysis confirms that only *Intimate Relationships* showed significantly more action than inaction regrets, χ^2 (1, 41) = 5.49, *p* = .019, ϕ = .37. Other domains had more inaction than action regrets: *Education*, χ^2 (1, 14) = 7.14, *p* = .008, ϕ = .71; *Family*, χ^2 (1, 31) = 5.45, *p* = .020, ϕ = .42; and *Health & Self-care*, χ^2 (1, 36) = 11.11, *p* = .001, ϕ = .56). The remainder had equivalent proportions of both (e.g., *Occupation*, *Finance*, *Parenting*, *Friendships*, *Travel/Move*, *Self*). This indicates that any effect of regret-type on the frequency of regrets may actually be moderated by the life domain from which the regrettable decision arose.

Figure 6 illustrates the intensity of action and inaction regrets within each life domain. Though it appears that some life domains differentially increase action or inaction regret intensity, analysis reveals there is no significant difference in the intensity of action and inaction regrets within any of the life domains. This supports the null result for regrets

overall and indicates once again that regret-type is not a key factor underpinning differences in regret intensity.

Figure 6. Graph showing the intensity of short-term regrets across life domains.

H4: *The most frequent regrets will occur in life domains characterised as non-intra/interpersonal, but the most intense regrets will occur in life domains characterised as intra/interpersonal, such as intimate relationships, self, and family.*

To ascertain whether regret frequency and intensity differed for inter/intra-individual (henceforth 'Intimate') issues versus non-intimate issues, each domain was divided into two broad categories[3]. The *Intimate* category reflected life domains associated with relationships with others or care for oneself: *Intimate relationships*, *Family*, *Parenting*, *Friendships*, *Health & Self-care*, and *Self*. The *Non-Intimate* category consisted of life domains which did not directly impact on individual relationships or care for oneself: *Education*, *Occupation*, *Finance*, *Lei*sure, *Travel/move*. The *Dual* and *Other* categories were disregarded from this analysis as they did not specifically reflect either of the proposed categories.

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[3] The development of these categories directly addresses hypothesis 2 and also reduces the inflation of Type 1 error which would occur if a One-Way ANOVA with post-hoc comparisons was conducted on all 13 life domains.
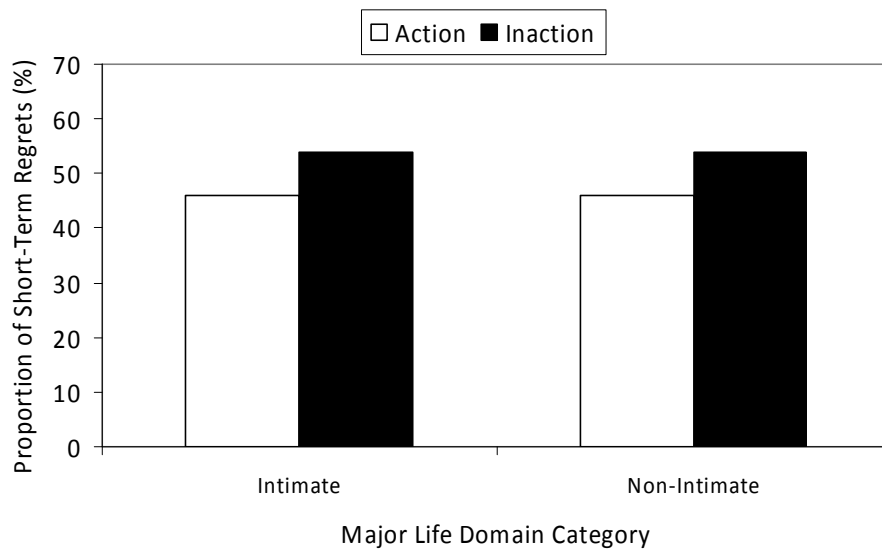
Figure 7. Graph showing the proportion of short-term action and inaction regrets that stem from Intimate and Non-Intimate life domain categories.

Chi-square analysis shows that, contrary to the hypothesised direction, regrets from *Intimate* domains significantly outnumbered those from *Non-Intimate* domains, χ^2 (1, 362) = 19.49, *p*< .001, ϕ = .23. Chi-square analysis also showed that the frequency of action and inaction regrets within each category were statistically equivalent (see Figure 7), so decisions from *Intimate* domains are more frequent than those from *Non-Intimate* domains irrespective of the number of action or inaction regrets within each domain.

An independent samples *t*-test was conducted to assess differences in regret intensity between these two categories and, as predicted, the regrets from *Intimate* domains were of greater intensity than those from *Non-Intimate* domains, *t* (366) = -3.50, *p*< .001, *d* = .38. T-tests also showed there was no difference in the intensity of action and inaction regrets within each broad domain (see Figure 8) indicating that decisions from *Intimate* domains were more intense than those from *Non-Intimate* domains irrespective of the whether the regrets within each domain were for action or inaction. Regrets from *Intimate* life domains are therefore more frequent *and* more intense than those from *Non-Intimate* life domains irrespective of regret-type, suggesting that decision focus (i.e., the life domain) rather than a simple decision for action or inaction may play a profound role in generating regret frequency and intensity.
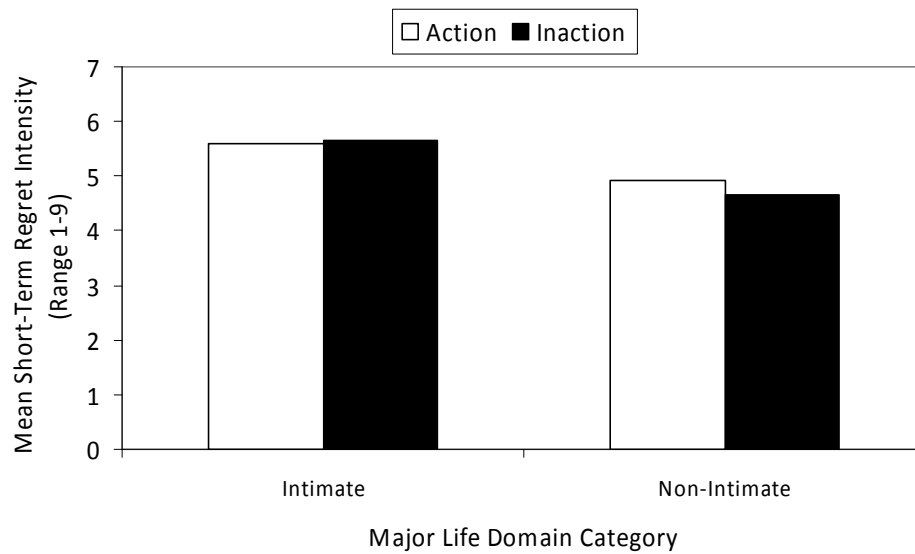
Figure 8. Graph show the mean intensity of short-term action and inaction regrets stemming from Intimate and Non-Intimate life domains.

A Summary of the Results for Short-Term Action and Inaction Regrets

There is little support for Gilovich and Medvec's (1994) temporal theory of regret which claims that short-term action regrets should be more frequent and (by association) more intense that short-term inaction regrets. Other than the small gender effects noted, action and inaction regrets were equally frequent and were of equal intensity. While this result by itself does not disconfirm the existence of a temporal effect (i.e., if frequency and intensity are intertwined then action and inaction regrets of equivalent frequency *should* produce equally intense regrets), further analysis suggests a temporal effect is not apparent. The frequency of action and inaction regrets varied considerably across life domains yet regret intensity within all life domains was equal for actions and inactions. Lastly, irrespective of the number of intensity of action and inaction regrets within each category, decisions involving *Intimate* issues were of greater intensity and frequency than *Non-Intimate* decisions. These results indicate that (1) life domain rather than the distinction between action and inaction is more likely the key to understanding regret frequency and intensity patterns, and (2) the concepts of regret frequency and regret intensity are largely independent of each other.

Gilovich and Medvec's (1994) temporal theory of life regrets – focussing on distinctions between regrets of action and inaction - does not provide an adequate or

coherent account of the trends in short-term regret intensity found in this study. From this point forward I will shelve the action/inaction distinction and instead focus on whether the DPTR provides a robust account of differences in short-term regret intensity. To ensure a comprehensive test of the DPTR model, once I have explored the impact of the two DPTR processes and of the complete model on short-term regret intensity, I will return to the action/inaction distinction and explore whether the complete DPTR model shows the same trends for action and inaction regrets independently.

Defining the Concept of Regret Intensity

Prior to conducting further analysis on the DPTR concepts and model, the association between the three measures of regret (i.e., intensity, thought about the event, and perceived life impact) were assessed to ascertain the degree of measurement overlap. Significant positive correlations were evident between intensity and thought about the event ($r = .60$, $r^2 = .36$, $p <.001$), intensity and perceived life impact ($r = .58$, $r^2 = .34$, $p <.001$), and thought about the event and perceived life impact ($r = .55$, $r^2 = .30$, $p <.001$). While the correlations suggest some overlap between measures, the effect sizes only indicate shared variance in the area of 33%, suggesting that all three should be treated as measures of related but distinct constructs. Therefore, unless stated otherwise, the specific measure of regret intensity referred to in subsequent analyses will represent only a measure of regret intensity rather than a composite measure of intensity, thought and impact.

Testing the Decision-Orientation Concept

H5:	*Regret intensity will be greater for orientation-inconsistent decisions than for orientation-consistent decisions.*
H13:	*Orientation-inconsistent decisions will generate greater levels of hot emotion that orientation-consistent decisions.*
H6:	*Feelings of responsibility for the poor outcome will be greater for orientation-inconsistent decisions than for orientation-consistent decisions.*

Table 5 shows the mean regret intensity, mean levels of regret-related emotions (i.e., hot, wistful, and despair emotions) and levels of responsibility for decisions classed as either consistent or inconsistent with participants' orientation. Independent samples *t*-tests reveal significant differences for all variables except wistful emotions; regret intensity, hot emotions, despair emotions, and levels of responsibility were greater for orientation inconsistent rather than orientation consistent decisions.

> **H7:** *Decision-orientation will influence regret intensity irrespective of individual preference for consistency.*

A bivariate correlation showed no apparent association between decision-orientation and preference for consistency, indicating the two were independent constructs. A hierarchical multiple regression analysis assessed the impact of decision-orientation and a general preference for consistency on regret intensity. Three predictor variables were entered in separate steps; the preference for consistency score at the first step, the decision-orientation at the second step, and an orientation/preference for consistency interaction term[4] in the third step (see Table 6).

Table 5

Means, standard deviations and t-tests for significant differences in the levels of short-term regret intensity, regret-related emotions and responsibility by decision-orientation.

	Decision-orientation					
	Orientation-consistent		Orientation-inconsistent			
	M	*SD*	*M*	*SD*	*t*	*Cohen's d*
Regret intensity	4.88	2.14	5.78	2.29	-4.01***	.41
Hot emotions	2.19	0.92	2.63	0.89	-4.68***	.49
Wistful emotions	2.00	0.78	2.11	0.77	-1.32	.01
Despair emotions	2.28	0.98	2.58	1.03	-2.94**	.30
Level of responsibility	3.58	1.35	3.81	1.24	-1.75*	.18

Note. All significance tests are one-tailed.
*p <.05, **p <.005, ***p <.001

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[4] The interaction term was a cross product of the deviation scores for both variables.

Table 6

Regression analysis for the effect of preference for consistency, decision-orientation and a preference/orientation interaction on short-term regret intensity.

Predictor Variables	B		
	Step 1	Step 2	Step 3
Preference for consistency	.113*	.106*	.127
Decision-orientation		.191**	.191**
Preference/orientation interaction coefficient			-.027
R^2	.013*	.049**	.050**
R^2 change	.013*	.037**	.01

*Note. N = 394, *p < .05, **p <.001*

The results of the regression analysis show that preference for consistency had a small but significant association with regret intensity, explaining just over 1% of the variance in intensity levels. However, the introduction of decision-orientation in the second step resulted in a significant R^2 change, indicating that decision-orientation accounted for approximately 4% more variation in regret intensity over and above that accounted for by preference for consistency. After the introduction of the preference/orientation interaction term in the third step, decision-orientation remained the only significant predictor of regret intensity suggesting that the impact of decision-orientation on regret intensity occurs over and above any main or moderating effect of a general preference for consistency.

Testing the Justification Trichotomy

H8: *Ego-proximal justifications will be considered subjectively stronger than ego-distal justifications.*

A one-tailed independent samples *t*-test shows no significant difference in participants' perceived strength of the two justifications, *t* (317) = -.11, *p* =.458. This indicates that ego-proximal justifications are not perceived as stronger than ego-distal justifications for short-term regrettable decisions.

H9:	*Regret intensity will be lower for ego-proximal justifications than for ego-distal justifications, and lower in turn for ego-distal justifications than for no justification.*
H14:	*Ego-distal justifications will generate greater levels of wistful and despair emotions than ego-proximal justifications, and unjustified decisions will generate greater levels of wistful and despair emotions than decisions with a justification (either ego-proximal or ego-distal).*

Table 7

Means and standard deviations for short-term regret intensity and regret-related emotions by decision-justification.

	Decision-justification					
	Ego-proximal		Ego-distal		No justification	
	M	*SD*	*M*	*SD*	*M*	*SD*
Regret intensity[a]	5.10	2.29	5.33	2.22	5.94	2.23
Hot emotions[b]	2.44	0.90	2.24	0.86	2.81	0.97
Wistful emotions[b]	2.12	0.80	2.02	0.76	2.08	0.79
Despair emotions[b]	2.50	1.04	2.37	0.97	2.48	1.04

Note. [a]Scale ranges from 1-9, [b]Scale ranges from 1-5

Table 7 presents the mean levels of regret intensity and regret-related emotion by decision-justification. Results of One-Way ANOVA[5] show that no significant differences across decision-justification types are apparent in levels of wistful and despair emotions, but there are significant differences in regret intensity, $F(2, 397) = 3.61$, $p = .028$, $\eta^2 = .02$, and hot emotions, $F(2, 373) = 10.03$, $p < .001$, $\eta^2 = .05$. Post-hoc analysis using Tukey HSD shows that decisions with no justification are more intense than decisions with ego-proximal justifications, and that a lack of justification generates significantly greater levels of hot emotions than decisions with ego-proximal or ego-distal justifications.

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[5] Eta-squared (η^2) was used as a measure of effect size for ANOVA because (1) η^2 is equivalent to R^2 in One-Way ANOVA which aids interpretation (Cardinal & Aitken, 2006), (2) although considered 'upwardly biased' this bias actually disappears in large *N* designs - such as the present study - where it generates effect size estimates equivalent to other statistics such as omega-squared or epsilon-squared (Kline, 2004; Levene & Hullett, 2002; Pierce, Block, & Aguinis, 2004), and (3) it is preferred to measures such as omega-squared when unequal groups sizes are apparent (Kline, 2004).

Testing the Relationship between Orientation and Justification Types

> **H11:** *Decision-orientation and decision-justification will be associated with each other but the association will be statistically small.*

A Chi-square analysis was used to assess the level of association between decision-orientation (i.e., consistent/inconsistent) and decision-justification (i.e., ego-proximal/ego-distal/no-justification). The results show that there is in fact no statistically significant association between the two, χ^2 (2, 399) = 5.05, p = .08, indicating that the choice of decision-orientation is statistically independent of that for decision-justification.

> **H12:** *Decision-orientation and decision-justification will both be statistically associated with regret intensity, and this association will be independent of one another.*

Table 8

Factorial ANOVA for the effect of decision-orientation and decision-justification on short-term regret intensity.

	df	SS	MS	F	$\eta^2_{partial}$
Decision-orientation	1	67.20	67.20	13.70**	.03
Decision-justification	2	22.15	11.08	2.26	-
Orientation / justification interaction coefficient	2	17.00	8.50	1.73	-
Error	393	1928.13	4.91		

** p <.001

A factorial ANOVA was undertaken to assess whether decision-orientation and decision-justification influenced regret intensity independent of one another as predicted by the DPTR. The results (see Table 8) indicate that decision-orientation significantly influenced short-term regret intensity levels but decision-justification did not. Furthermore, the lack of a significant interaction effect suggests that the influence of decision-orientation on regret intensity is independent of any effect of decision-justification. These results also indicate that decision-orientation might be the only DPTR process that impacts on short-term regret intensity.

Testing the DPTR Model

Based on responses to the decision-orientation and decision-justification questions in the questionnaire, six groups were created reflecting each group in the DPTR model (see Table 9). No significant skewness or kurtosis of regret intensity scores was evident for DPTR groups, and Levene's test (Levene, 1960) verified homogeneity of variance. Table 9 also presents a matrix with contrast weights for five planned comparisons designed to ascertain whether the hypothesised trends in regret intensity across DPTR groups are present[6].

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[6] Planned comparison ANOVAs are an effective test of predicted group differences as they involve contrast weighting of the specific groups of interest, avoiding the decrease in computational power and increase in family-wise error associated with multiple ANOVA post-hoc comparisons (see Loftus, 1996; Myers & Well, 2003; Rosenthal, Rosnow, & Rubin, 2000).

Table 9

The formulation of the six DPTR groups based on orientation and justification responses, with illustration of the five planned comparisons and associated contrast weights.

Orientation type	Justification type	Group number	Short-term regret group n	Five planned comparisons and associated contrast weights				
				1	2	3	4	5
Consistent	Ego-proximal	1	70	-2.5	-1	0	0	-.25
Consistent	Ego-distal	2	82	-1.5	0	-1	0	-.25
Consistent	No justification	3	26	-.5	0	0	-1	.5
Inconsistent	Ego-proximal	4	73	.5	1	0	0	-.25
Inconsistent	Ego-distal	5	92	1.5	0	1	0	-.25
Inconsistent	No justification	6	50	2.5	0	0	1	.5

Note. The 5 planned comparisons above are not orthogonal. However, this lack of orthogonality does not increase the type 1 error rate as the number of comparisons does not equal or exceed the degrees of freedom.

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H15: *Regret intensity will conform to the pathways predicted by the DPTR model, such that the lowest intensity will be for orientation consistent decisions that have ego-proximal justifications, and the highest will be for orientation-inconsistent decisions lacking any form of justification.*

H10: *Regret intensity will be lower for justified decisions (ego-proximal and ego-distal combined) than for unjustified decisions.*

Figure 9. Graph showing the mean short-term regret intensity and 95% confidence intervals for each of the six DPTR groups.

The first planned comparison assessed whether regret intensity across groups matched the monotonic increase hypothesised to exist across DPTR groups. Each group was assigned a contrast weight reflecting its predicted regret intensity ranking in comparison to the other five groups. The results of the first planned comparison confirmed that the increase in regret intensity across DPTR groups was significant and constitutes a moderate effect of DPTR group membership on regret intensity, $F (1, 393) = 21.66$, $p < 0.001$, $\eta^2 = 0.05$ (see Figure 9). This means that regret intensity increases across DPTR groups mostly in the manner hypothesised.

The remaining planned contrasts presented in Table 9 explore the extent to which between-group differences, expected in the DPTR model, were apparent in short-term regrets. Specifically, the second, third, and fourth planned comparisons explore whether differences in regret intensity exist between decisions which differ in decision-orientation and which have ego-proximal justifications, ego-distal justifications, and no justifications respectively. Results show more regret is felt for orientation-inconsistent, compared to

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orientation-consistent, decisions which have ego-proximal justifications, F (1, 393) = 11.32, p = 0.001, η^2 = 0.03, or which are unjustified, F (1, 393) = 4.27, p = 0.039, η^2 = 0.01. No difference in regret intensity exists between orientation-consistent and inconsistent decisions with ego-distal justifications, F (1, 393) = 1.12, p = 0.29. This suggests that decision-orientation is distinct from justification use as it differentially impacts on two of the three justification types. The fact that decision-orientation differentially impacts on ego-proximal, but not ego-distal, justification also supports the notion that these two forms of justification are unique constructs. The fifth planned comparison explores a central tenet of the DPTR and previous justification-based regret theories; i.e., that a difference exists in the regret intensity of justified decisions (ego-proximal and distal combined) and unjustified decisions (irrespective of decision-orientation). The results indicate that unjustified decisions do not inspire greater regret than justified decisions, F (1, 393) = 3.74, p = 0.054, $\eta^2 < 0.01$.

Testing the DPTR: Action and Inaction Regrets

> **H16:** *The regret intensity trends predicted by the DPTR will still be evident when the intensity of action and inaction regrets are analysed separately.*

To provide a comprehensive test of the DPTR theory I need to ascertain whether the predicted differences in regret intensity exist *irrespective* of whether the decision was for action or inaction (a distinction that pervades the regret literature to date). The same five planned comparisons noted in Table 9 were re-run for short-term action and inaction regrets independently. The mean regret intensity levels for each DPTR group for action and inaction regrets independently are depicted in Figures 10a and 10b respectively, and both show the same general monotonic increase.

Action Regrets Only
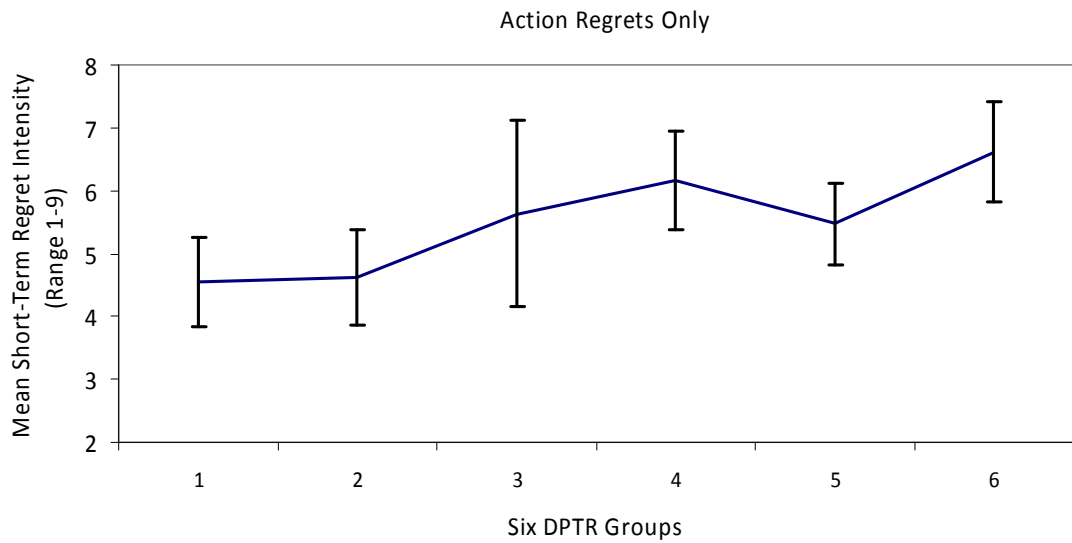
Figure 10a. Graph showing the mean short-term regret intensity and 95% confidence intervals across DPTR groups for action regrets only.

Inaction Regrets Only
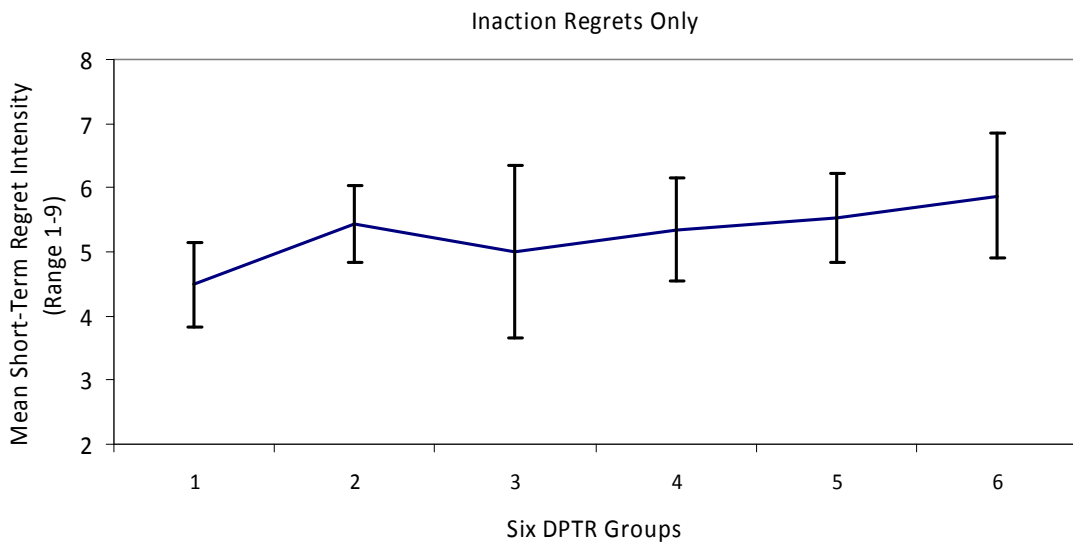
Figure 10b. Graph showing the mean short-term regret intensity and 95% confidence intervals across DPTR groups for inaction regrets only.

The results of the first planned comparison confirmed the presence of a monotonic increase in regret intensity across DPTR groups for both action, F (1, 180) = 16.39, p <.001, η^2 = 0.08, and inaction regrets, F (1, 201) = 5.30, p = .02, η^2 = 0.03., suggesting the trend was stronger for action than inaction regrets in the short-term. Results of the second planned comparison shows that greater regret was felt for orientation-inconsistent decisions, compared to orientation-consistent, with ego-proximal justifications, but only if the regret

was one of action, F (1, 180) = 9.20, p = 0.003, η^2 = 0.05. The results of the third and fourth planned comparisons show that, for both action and inaction regrets, no difference in regret intensity exists for ego-distal justifications and unjustified decisions which differ in decision-orientation. The results of the fifth planned comparison show that, irrespective of decision-orientation, justified decisions (ego-proximal and ego-distal combined) inspired less regret than unjustified decisions for action regrets, F (1, 180) = 4.62, p = .033, η^2 = .03, but not for inaction regrets.

A Summary of Results for Short-Term Regrets

Action and Inaction Regrets

These results offer no support for Gilovich and Medvec's (1994) temporal theory of regret. Other than slight (and unexpected) gender effects the frequency and intensity of short-term action and inaction regrets are equivalent for participants overall. When regrets are assessed by life domain there is even more evidence to suggest that a temporal theory of regret based on the distinction between actions and inactions does not provide enough complexity to account for the resulting patterns of regret frequency and intensity. Regret intensity is more likely driven by the issue at hand (e.g., Intimate concerns are more intense than non-intimate) and how it ultimately relates to our sense of ourselves and our relationships with others than by a simple distinction between action and inaction.

Decision-Orientation and Decision-Justification Concepts

Orientation-inconsistent decisions are more intensely regretted and 'hotter' than orientation-consistent decisions, suggesting that the choice of decision-orientation influences short-term regret intensity. Furthermore, decision-orientation operates independently of a general preference for consistency, supporting the contention that it is situation-dependent and not a general, cross-situational, preference for consistent behaviour. Ego-proximal and ego-distal justification did not differ in perceived strength, but the differing levels of regret intensity and hot emotions across decision-justification type offers some support for the trichotomising of justifications in the DPTR. However, alongside decision-orientation, decision-justification does not account for any unique variance in the intensity of short-term regret, suggesting that the distinction envisaged between decision-

justifications may either be inadequately measured in the current study or may simply not exist.

The DPTR Model

Mean regret intensity levels increased across DPTR groups in the predicted pattern which supports the assumption of a monotonic increase in regret as a function of decision-orientation and decision-justification. There were also expected differences in regret intensity between orientation-consistent and inconsistent decisions which had ego-proximal justifications or were unjustified. The fact that no such effect was found for ego-distal justifications indicates that ego-proximal and ego-distal justifications may have different underlying mechanisms, and this result in turn supports a distinction between the two justifications in the DPTR. Despite the same general increase in regret intensity across DPTR groups for both action and inaction decisions independently, further trends expected between DPTR groups are only apparent for regrets of action rather than regrets of inaction.

CHAPTER 8.

RESULTS – LONG-TERM REGRETS

This chapter will undertake the same analyses as conducted in Chapter 7, but the focus will now be on participants' *long-term* regrets. Much of the literature on real-life regret focuses on long-term, rather than short-term, analysis of life decisions so it is especially important to assess whether the predictions made by the DPTR model are evident in participants' long-term regrets. Replicating the format of the previous chapter, the hypotheses will again appear prior to specific analyses to facilitate comprehension and ease reader burden.

Assessing Regret Frequency and Intensity

Four hundred and ninety-nine (499) participants had a long-term regret; 262 were for inaction, 223 for action, and 14 indeterminate[1]. Table 10 presents the frequency and intensity of long-term action and inaction regrets overall, by gender, and by age group.

H1:	*There will be a greater frequency (i.e., number) of inaction than action regrets in the long-term but the intensity of action and inaction regrets will be equivalent.*
H2:	*Younger adults will report equally frequent long-term action than inaction regrets, older adults will report more inactions than actions, but there will be no such age-related differences in the intensity of action and inaction regret.*

Statistical analysis indicates no significant difference in the frequency of action or inaction regrets overall or split by gender, although there was one interesting age-related finding. Action and inaction regrets were equally frequent for younger and middle-aged adults, but older adults had significantly more inaction than action regrets, $\chi^2 (1, 105) = 5.04$, $p = .025$, $\phi = .22$. This supports the hypothesised trends for younger and older adults suggesting the temporal trend may be age-dependent and, therefore, is likely associated with the time elapsed since the regrettable decision.

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[1] As in Chapter 7, from this point forward all analysis of action and inaction regrets will disregard the presence of 'indeterminate' regrets.

Table 10

Frequency and three measures of intensity for long-term action and inaction regrets overall, by gender and by age group.

| | Frequency[c] | | Three measures of regret intensity | | | | | |
| | | | Intensity[d] | | Thought[d] | | Impact[d] | |
	Action re-grets	Inaction re-grets	Action regrets	Inaction regrets	Action regrets	Inaction regrets	Action regrets	Inaction regrets
Overall	223 (46%)	262 (54%)	6.25 (2.22)	5.67 (2.23)	2.14 (1.31)	1.90 (1.21)	4.10 (1.04)	3.68 (1.14)
Gender[a]								
Male	70 (45%)	85 (55%)	6.60 (2.14)	5.07 (2.13)	2.34 (1.28)	1.71 (1.10)	4.21 (1.03)	3.54 (1.06)
Female	152 (47%)	174 (53%)	6.07 (2.25)	5.95 (2.24)	2.05 (1.31)	1.99 (1.27)	4.04 (1.04)	3.75 (1.18)
Age[b]								
Younger adult	78 (50%)	77 (50%)	6.10 (2.28)	5.57 (2.24)	2.04 (1.30)	1.94 (1.28)	3.77 (1.02)	3.79 (1.04)
Middle-aged adult	102 (46%)	118 (54%)	6.25 (2.14)	5.77 (2.34)	2.16 (1.26)	1.96 (1.26)	4.24 (1.04)	3.70 (1.23)
Older adult	41 (39%)	64 (61%)	6.41 (2.34)	5.56 (2.06)	2.24 (1.43)	1.75 (1.05)	4.34 (0.94)	3.50 (1.08)

Note. Regret intensity scale ranges from 1-9; Thought and Impact scales both range from 1-5.

[a] Four participants did not indicate their gender; [b] Five participants did not indicate their age; [c] Row proportion appears in parentheses;

[d] Standard deviation appears in parentheses.

In support of this theory a One-Way ANOVA showed a significant linear increase across age groups in time elapsed since the regrettable event such that the regrets of older adults occurred earlier than those of middle-aged adults, whose regrets in turn occurred earlier than those of younger-adults, F (2, 468) = 144.76, $p<.001$, η^2 = .12. Though this finding is logical (i.e., older people *can* have older regrets than younger people because they are *older*!) these results in combination suggest Gilovich and Medvec's (1994) temporal trend for long-term regret frequency involves an 'age-threshold'.

An independent samples *t*-test exploring the mean difference in regret intensity for action and inaction regrets showed that, overall, action regrets were significantly more intense than inaction regrets, t (483) = 2.85, p =.005, d = .26, and further analysis suggests strong gender and age effects may be driving this effect. Men felt greater intensity, t (153) = 4.44, p <.001, d = .72, level of thought, t (153) = 3.33, p =.001, d = .53, and perceived life impact, t (153) = 3.97, p <.001, d = .64, for action rather than inaction regrets, while women only felt actions had a greater perceived life impact than inactions, t (324) = 2.37, p =.018, d = .26. This indicates that the distinction between action and inaction had a much greater effect on the experience of regret for men than women. Older adults felt greater regret intensity, t (103) = 1.96, p =.053, d = .39, greater thought, t (103) = 2.04, p =.044, d = .40, and greater perceived impact, t (103) = 4.09, p <.001, d = .83, for their actions rather than their inactions. In contrast, the only difference for either younger or middle-aged adults on any of the intensity measures was that actions had a significantly greater impact than inactions for middle-aged adults, t (218) = 3.44, p =.001, d = .45. This indicates that the distinction between action and inaction had a much greater influence on the experience of regret for older adults than for others.

These results suggest that regret-type has a greater impact on the experience of long-term regret for older adults (especially men) than other demographic groups, and this suggests that an 'age-threshold' similar to that found for regret frequency might be driving this pattern. To explore this possibility a regression analysis was conducted; age was entered into the first step of the regression to control for its relationship with elapsed time (r = .64, $p<.001$, r^2 = .41), and the second step consisted of regret type (action/inaction), time elapsed since the regrettable decisions, and a time/regret-type interaction coefficient[2]. Results show no significant main or interaction effects of these variables on

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[2] The interaction term was a cross product of the deviation scores for regret-type and time elapsed.

regret intensity, so an age-threshold does not explain this pattern. A review of the gender balance in each age group suggests that the apparent age-effect might instead be driven by an underlying gender-effect. Chi-square analysis shows that the proportion of men significantly increases across age groups, χ^2 (2, 480) = 8.96, p = .011, ϕ = .14, such that men constitute 24% of younger-adults, 34% of middle-aged adults, and 41% of older adults. The significant regret intensity, thought and impact results found for older adults but not middle-aged or younger adults could therefore have arisen because men constitute a significantly greater proportion (nearing 50%) of the older adult group, and the distinction between action and inaction regrets is much greater for men than it is for women.

> **H3:** *Within each life domain there will be a greater frequency (i.e., number) of inaction than action regrets in the long-term but the intensity of action and inaction regrets will be equivalent.*

Figure 11. Graph showing the frequency of long-term regrets across life domains.

Figure 11 shows the frequency of action and inaction regrets within each of the 13 life domains. As was the case with the short-term regrets, the proportion of action and inaction regrets seem to vary considerably as a function of life domain. Chi-square analysis of the frequency of action and inaction regrets within each domain shows that actions were

significantly more frequent than inactions for the life domains of *Intimate Relationships*, χ^2 (1, 86) = 26.79, *p* < .001, ϕ = .56, and *Health & Self-care*, χ^2 (1, 21) = 3.86, *p* = .050, ϕ = .43. Conversely, inaction regrets significantly outnumbered action regrets in the life domains of *Education*, χ^2 (1, 73) = 35.63, *p* < .001, ϕ = .70, and *Family*, χ^2 (1, 52) = 17.31, *p* < .001, ϕ = .58. All other life domains had action and inaction regrets of equal frequency[3].

Figure 12. Graph showing the intensity of long-term regrets across life domains.

Figure 12 illustrates the level of regret for action and inaction regrets within each life domain. The pattern suggests that actions and inactions produce regrets of relatively similar intensity, and statistical analysis confirms that there were no significant differences in action and inaction intensity within any life domain[4].

H4:	*The most frequent regrets will occur in life domains characterised as non-intra/interpersonal, but the most intense regrets will occur in life domains characterised as intra/interpersonal, such as intimate relationships, self, and family.*

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[3] Although the proportions of action and inaction regrets in some life domains suggest a significant difference (e.g., Finance, Friendships, Travel/move) the generally low number of regrets per cell rendered such differences non-significant.

[4] Statistical analysis of mean differences for *Leisure* regrets was inappropriate as the assumption of equality of variance was violated, likely as a result of the small cell size (N = 4).
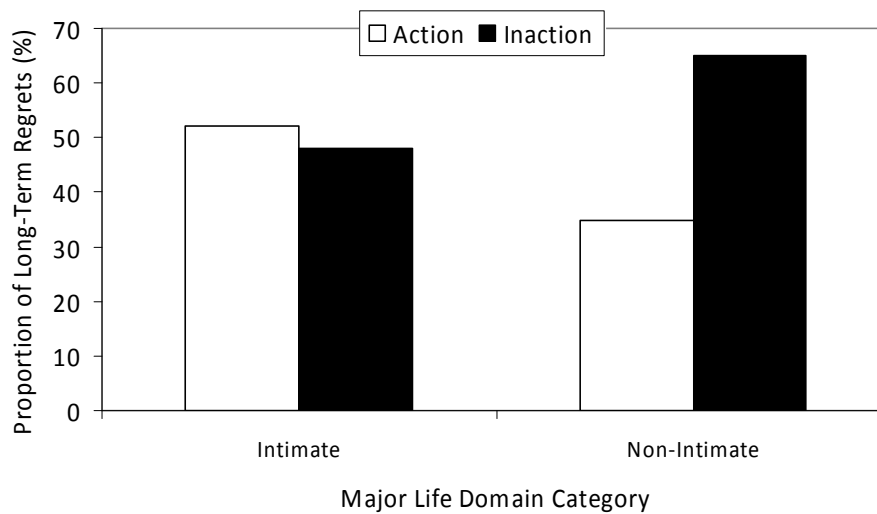
Figure 13. Graph showing the proportion of long-term action and inaction regrets stemming from Intimate and Non-Intimate life domain categories.

The *Intimate* and *Non-Intimate* life domain categories identified in the previous chapter were replicated for long-term regrets. A chi-square analysis conducted on the frequency of regrets from each broad domain showed that, contrary to the hypothesised trend, decisions from *Intimate* domains significantly outnumbered those from *Non-Intimate* domains, χ^2 (1, 452) = 17.13, *p*< .001, ϕ = .19. Chi-square analysis of the number of action and inaction regrets within each domain showed that *Intimate* domains had statistically equivalent numbers of action and inaction regrets, but *Non-Intimate* domains showed significantly more inaction than action regrets, χ^2 (1, 182) = 17.23, *p*< .001, ϕ = .31 (see Figure 13). These results indicate that the temporal trend for greater long-term inaction than action regrets is evident for *Non-Intimate* decision domains but not for *Intimate* decisions domains.

An independent samples *t*-test also showed that *Intimate* domains produced regrets of greater intensity than *Non-Intimate* domains, *t* (450) = -7.18, p <.001, d = .69. The results of *t*-tests conducted on the intensity of action and inaction regrets within each broad domain category showed that the action and inaction regrets within the *Intimate* domain were statistically equivalent, but action regrets in the *Non-Intimate* domain were significantly more intense than the respective inaction regrets, *t* (180) = 2.26, p =.025, d = .34 (see Figure 14). These results suggest that regrets over decisions from *Intimate* life domains are generally more numerous *and* more intense than those from *Non-Intimate* life domains, irrespective of the number or intensity of action and inaction regrets within each domain.
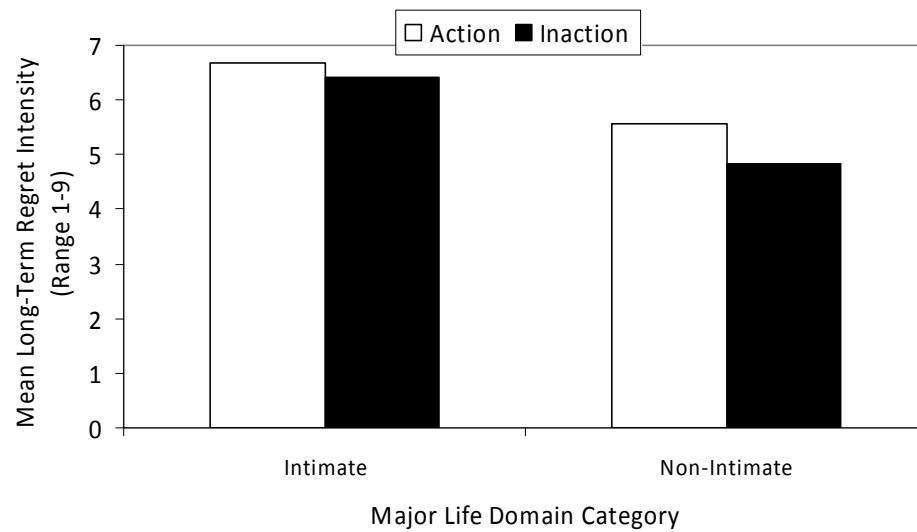
Figure 14. Graph showing the mean intensity of long-term action and inaction regrets stemming from Intimate and Non-Intimate life domains.

A Summary of the Results for Long-Term Action and Inaction Regrets

Aside from older adults, regret of action and inaction occurred equally frequently and, in contrast to the predicted temporal pattern, action regrets were more intense than inaction regrets (especially for men and older adults). These results indicate that (1) the frequency - but not the intensity - of long-term regrets follows the temporal pattern outlined by Gilovich and Medvec (1994) only when viewed as a factor of age, and (2) any differences in the intensity of long-term regrets are likely due to a strong gender effect. When regrets were categorised by life domain it was clear that the temporal theory did not provide a clear account of the resulting regret frequency trends as some domains had more actions than inactions, others the reverse, and still others showed equivalent frequency. Furthermore, the intensity of action and inaction regrets within each life domain was equivalent which confirms the hypothesised pattern of regret intensity but contrasts with Gilovich and Medvec's predictions. Lastly, regrets from *Intimate* life domains are more numerous and more intense than regrets from *Non-Intimate* life domains, irrespective of the number or intensity of action and inaction regrets within each domain. This indicates that it is the nature of our regret (i.e., the issue at hand) rather than a distinction between action and inaction which is the primary factor influencing the frequency and intensity of regret.

The action and inaction distinction will now be shelved as the remainder of the chapter turns instead to an analysis of the DPTR and whether its dual processes influence long-term regret intensity in the manner hypothesised. However, as was the case in Chapter 7, I will return to the regret-type distinction at the end of the chapter to explore whether the DPTR predicts regret intensity equally well across action and inaction decisions as is anticipated.

Defining the Concept of Regret Intensity

As with the short-term results, the association between the three measures of regret (i.e., intensity, thought about the event, and perceived life impact) was assessed to ascertain the degree of measurement overlap. Significant positive correlations are again evident between intensity and thought about the event ($r = .49$, $r^2 = .24$, p <.001), intensity and perceived life impact ($r = .62$, $r^2 = .38$, p <.001), and thought about the event and perceived life impact ($r = .46$, $r^2 = .21$, p <.001). While this once more confirms that these concepts are highly related, the shared variance of between 21-38% confirms that they should also be treated as independent concepts. In keeping with the previous chapter, the specific measure of regret intensity referred to in subsequent analyses of the DPTR will represent *only* a measure of regret intensity rather than a composite measure of intensity, thought and impact.

Testing the Decision-Orientation Concept

H5:	*Regret intensity will be greater for orientation-inconsistent decisions than for orientation-consistent decisions.*
H13:	*Orientation-inconsistent decisions will generate greater levels of hot emotion than orientation-consistent decisions.*
H6:	*Feelings of responsibility for the poor outcome will be greater for orientation-inconsistent decisions than for orientation-consistent decisions.*

Table 11 compares mean long-term regret intensity levels, mean levels of regret-related emotions (i.e., hot, wistful, and despair emotions) and levels of responsibility for decisions classed as either consistent or inconsistent with participants' orientation. Mirroring the

Table 11

Means, standard deviations and t-tests for significant differences in the levels of long-term regret intensity, regret-related emotions and responsibility by decision-orientation.

| | Decision-orientation | | | | | |
| | Orientation-consistent | | Orientation-inconsistent | | | |
	M	SD	M	SD	t	Cohen's d
Regret intensity	5.37	2.34	6.41	2.08	-5.16***	.47
Hot emotions	1.98	1.04	2.54	1.03	-5.56***	.54
Wistful emotions	2.19	0.83	2.36	0.93	-1.92*	.19
Despair emotions	2.32	1.04	2.65	1.07	-3.17**	.31
Level of responsibility	3.29	1.47	3.65	1.32	-2.89**	.26

Note. All significance tests are one-tailed.
*p <.05, **p<.005, ***p <.001

results for short-term regrets, one-tailed independent samples *t*-tests reveal that regret intensity, levels of hot, wistful, and despair emotions, and levels of responsibility are greater for orientation-inconsistent decisions than for orientation-consistent decisions.

> **H7:** *Decision-orientation will influence regret intensity irrespective of individual preference for consistency.*

A bivariate correlation showed no apparent association between decision-orientation and preference for consistency, indicating the two were independent constructs. Table 12 shows the results of a multiple regression conducted to assess the degree to which decision-orientation influenced regret intensity independent of a general preference for consistency, using identical steps as the analysis outlined for short-term regrets in the previous chapter. Consistent with the results for short-term regrets, Table 12 shows that decision-orientation is the only variable in the model with any predictive power, accounting for approximately 5% of the variance in regret intensity, and that the impact of decision-orientation on regret intensity occurs over and above the non-existent main or moderating effect of a general preference for consistency.

Table 12

Regression analysis for the effect of preference for consistency, decision-orientation and a preference/orientation interaction on long-term regret intensity.

	β		
Predictor Variables	Step 1	Step 2	Step 3
Preference for consistency	.032	.002	.008
Decision-orientation		.222*	.222*
Preference/orientation interaction coefficient			-.008
R^2	.001	.049*	.049*
R^2 change	.001	.048*	.000

Note. N = 473, *p < .001

Testing the Justification Trichotomy

H8: *Ego-proximal justifications will be considered subjectively stronger than ego-distal justifications.*

Ego-proximal justifications were conceptualised as those based on strongly held personal values, and ego-distal justifications as those based on an external value system (e.g., social norms for behaviour that have not been internalised by the individual). As such the former were depicted as subjectively stronger than the latter because they carry the weight of personal conviction. A one-tailed independent samples *t*-test was conducted to test whether participants' perceptions of the strength of their justification was greater for those with ego-proximal rather than ego-distal justifications, and statistical analysis indicates that there was no difference in perceived justification strength, *t* (367) = -1.67, p =.096.

H9: *Regret intensity will be lower for ego-proximal justifications than for ego-distal justifications, and lower in turn for ego-distal justifications than for no justification.*

H14: *Ego-distal justifications will generate greater levels of wistful and despair emotions than ego-proximal justifications, and unjustified decisions will generate greater levels of wistful and despair emotions than decisions with a justification (either ego-proximal or ego-distal).*

Table 13

Means and standard deviations for long-term regret intensity and regret-related emotions by decision-justification.

	Decision-justification					
	Ego-proximal		Ego-distal		No justification	
	M	*SD*	*M*	*SD*	*M*	*SD*
Regret intensity[a]	5.51	2.19	6.10	2.20	6.43	2.31
Hot emotions[b]	2.12	.94	2.25	1.04	2.71	1.15
Wistful emotions[b]	2.31	.92	2.26	.82	2.29	.99
Despair emotions[b]	2.46	1.10	2.46	.96	2.68	1.18

Note. [a]Scale ranges from 1-9, [b]Scale ranges from 1-5

Table 13 presents the mean levels of long-term regret intensity and regret-related emotion by decision-justification, and One-Way ANOVAs were undertaken on each measure to assess whether the justification trichotomy produced any significant differences in each measure. Mirroring the results for short-term regrets, no significant differences in the levels of wistful and despair emotions are apparent across decision-justification, but there are significant difference in regret intensity, $F(2, 476) = 5.99$, p =.003, $\eta^2 = .02$, and in levels of hot emotions, $F(2, 428) = 10.21$, p <.001, $\eta^2 = .05$. Post-hoc analysis using Tukey HSD shows that decisions with either ego-distal or no justification are of greater intensity than decisions with ego-proximal justifications, and that a lack of justification generates significantly greater levels of hot emotions than decisions with ego-proximal or ego-distal justifications. Taken in total, these results suggest that while ego-proximal and ego-distal justifications may not differ in perceptible strength they do differ in their ability to generate regret reactions, therefore supporting a distinction between the two decision-justifications.

Testing the Relationship Between Orientation and Justification Types

H11:	*Decision-orientation and decision-justification will be associated with each other but the association will be statistically small.*
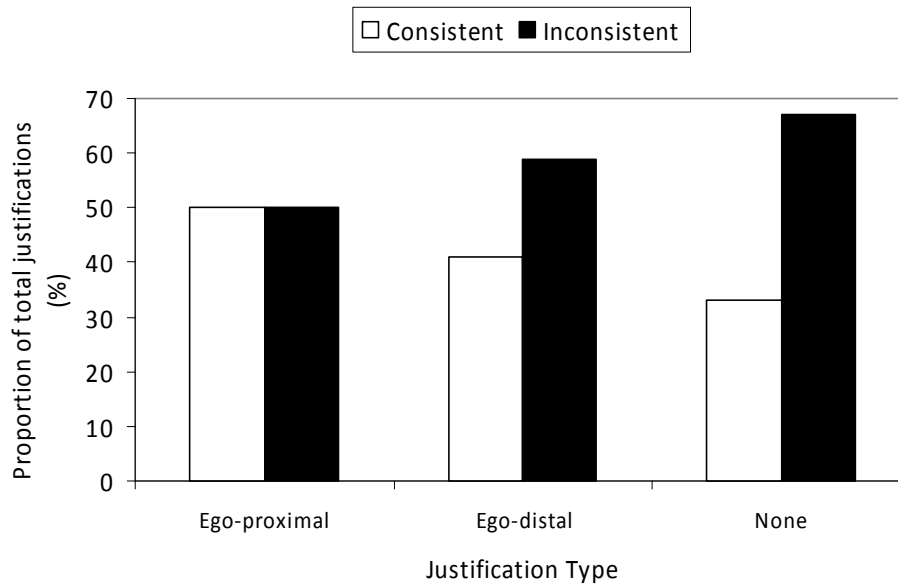
Figure 15. A graph showing the proportion of orientation-consistent and inconsistent decisions as a factor of decision-justification.

A small but significant relationship between decision-orientation and decision-justification was hypothesised based on the common values and beliefs underpinning them. Figure 15 shows the proportion of orientation-consistent and inconsistent decisions by justification type. The trend suggests that decisions were much more likely to be orientation-inconsistent as the justification base shifts from ego-proximal through to a lack of justification, and Chi-square analysis confirms that this trend is statistically significant, χ^2 (2, 474) = 7.71, p = .02, ϕ = .13.

H12: *Decision-orientation and decision-justification will both be statistically associated with regret intensity, and this association will be independent of one another.*

Having established a small but significant categorical relationship between decision-orientation and decision-justification, a factorial ANOVA was conducted to assess whether decision-orientation and decision-justification influenced long-term regret intensity independently of one another. The results (see Table 14) show that decision-orientation and decision-justification do not significantly interact to influence regret intensity, but that

they both account for significant variation in long-term regret intensity independent of one another. This confirms the underlying structure of the DPTR in that decision-orientation and decision-justification are both significant predictors of change in long-term regret intensity, but the lack of interaction between the two constructs may indicate that there is no consistent increase in regret intensity across DPTR groups as originally hypothesised.

Table 14

Factorial ANOVA for the effect of decision-orientation, decision-justification, and an orientation/justification interaction on long-term regret intensity.

	df	*SS*	*MS*	*F*	$\eta^2_{partial}$
Decision-orientation	1	90.84	90.84	18.96**	.04
Decision-justification	2	41.07	20.54	4.29*	.02
Orientation / justification interaction coefficient	2	2.31	1.15	0.24	<.00
Error	468	2241.91			

* *p* <.05, **p<.001

Testing the DPTR Model

As with the short-term regrets, six groups were created to reflect each group in the DPTR model (see Table 15), and once more analysis of regret intensity distribution within these groups shows no significant skewness or kurtosis, and Levene's test (Levene, 1960) verifies homogeneity of variance. Table 15 also replicates the contrast weighting matrix for the 5 planned comparisons conducted for short-term regrets in Chapter 7.

> **H15:** *Regret intensity will conform to the pathways predicted by the DPTR model, such that the lowest intensity will be for orientation-consistent decisions that have ego-proximal justifications, and the highest will be for orientation-inconsistent decisions lacking any form of justification.*
>
> **H10:** *Regret intensity will be lower for justified decisions (ego-proximal and ego-distal combined) than for unjustified decisions.*

Table 15

The formulation of the six DPTR groups based on orientation and justification responses, with illustration of the five planned comparisons and associated contrast weights.

Orientation type	Justification type	Group number	Long-term regret group n	Five planned comparisons and associated contrast				
				weights				
				1	2	3	4	5
Consistent	Ego-proximal	1	75	-2.5	-1	0	0	-.25
Consistent	Ego-distal	2	84	-1.5	0	-1	0	-.25
Consistent	No justification	3	34	-.5	0	0	-1	.5
Inconsistent	Ego-proximal	4	75	.5	1	0	0	-.25
Inconsistent	Ego-distal	5	121	1.5	0	1	0	-.25
Inconsistent	No justification	6	71	2.5	0	0	1	.5

Note. The 5 planned comparisons above are not orthogonal. However, this lack of orthogonality does not increase the type 1 error rate as the number of comparisons does not equal or exceed the degrees of freedom.
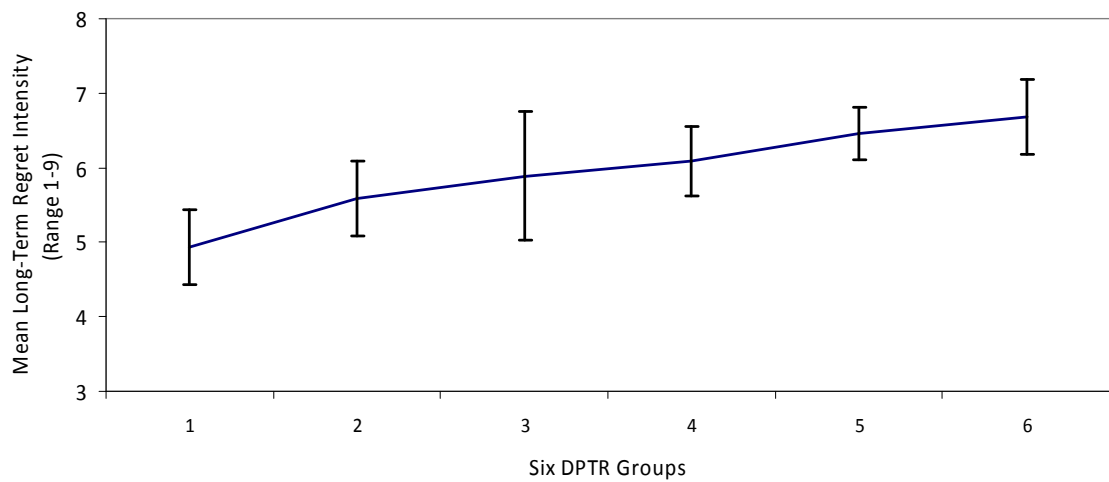
Figure 16.   Graph showing the mean long-term regret intensity and 95% confidence intervals for each of the six DPTR groups.

The first planned comparison assessed the presence of a hypothesised monotonic increase in regret intensity across DPTR groups (See Figure 16). The significant result confirms that regret intensity does increase across DPTR groups, this monotonic increase is not due to chance, and it constitutes a moderate effect of DPTR group membership on regret intensity, F (1, 468) = 31.48, p < 0.001, η^2 = 0.06.

The results of the second and third planned comparisons show that orientation-inconsistent decisions generate greater regret than orientation-consistent decisions despite the same ego-proximal justification, F (1, 468) = 10.40, p=.001, η^2 = .02., or ego-distal justification, F (1, 468) = 8.21, p=.004, η^2 = .02, though the overall effect size for both is relatively small. The fourth planned comparison showed unjustified decisions differing in decision-orientation did not significantly differ in regret intensity. The fifth planned comparison revealed that, irrespective of decision-orientation, unjustified decisions were significantly more intensely regretted than decisions with a justification (ego-proximal and ego-distal combined) though the effect was quite small, F (1, 468) = 4.30, p =.039, η^2 = .01.

Testing the DPTR: Action and Inaction Regrets

H16: *The regret intensity trends predicted by the DPTR will still be evident when the intensity of action and inaction regrets are analysed separately.*
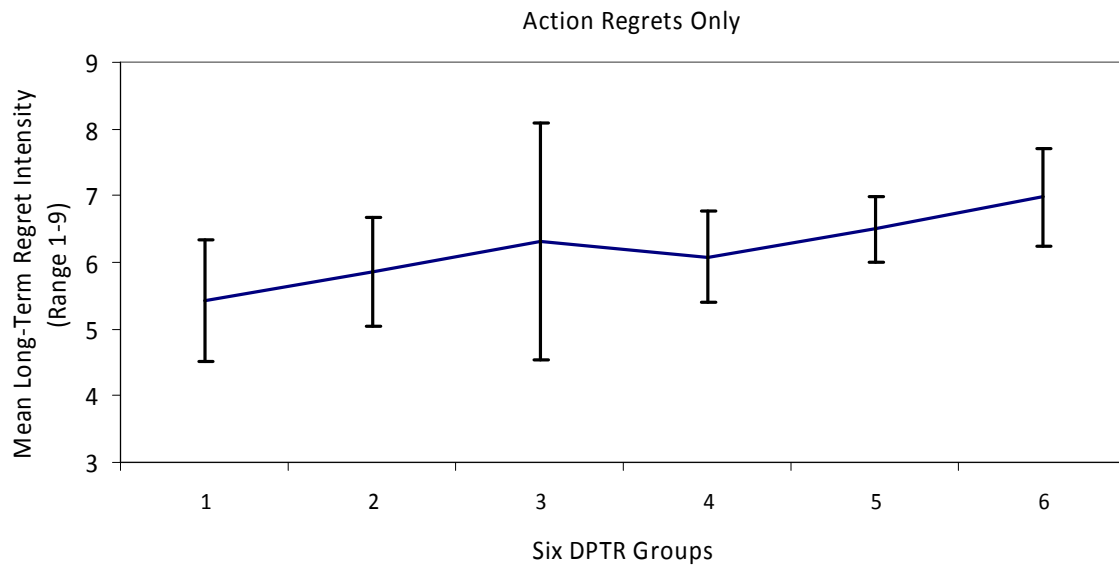
Figure 17a.   Graphs showing the mean long-term regret intensity and 95% confidence intervals across DPTR groups for action regrets only.
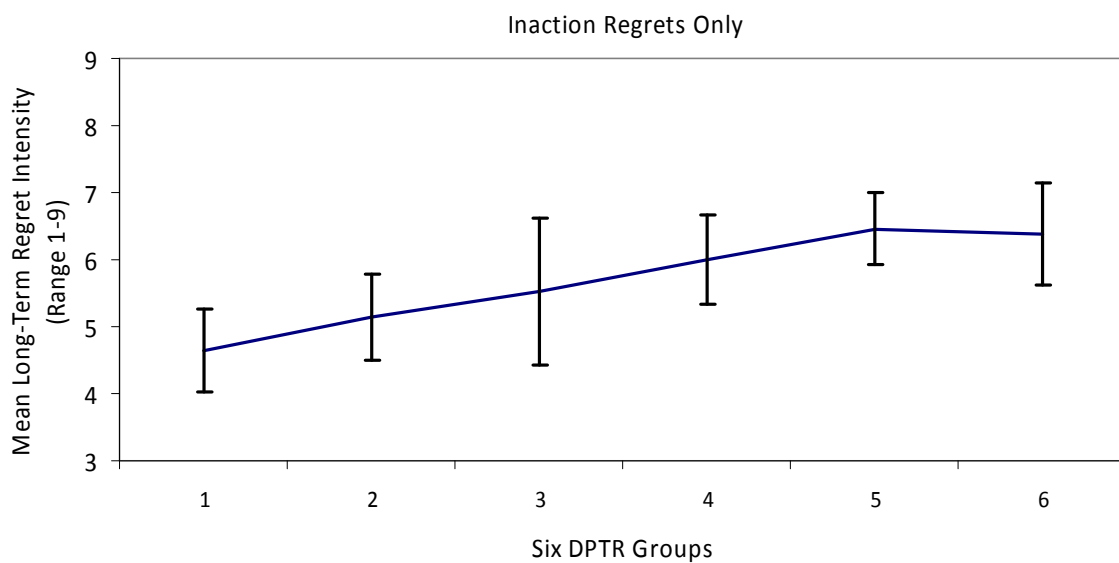
Figure 17b.   Graphs showing the mean long-term regret intensity and 95% confidence intervals across DPTR groups for inaction regrets.

In order to test for any effect of regret-type on regret intensity in the DPTR model the same planned comparisons were replicated for long-term action and inaction regrets separately. Mean long-term regret intensity for action and inaction regrets across DPTR groups is illustrated in Figure 17a and Figure 17b, and the results of the first planned comparisons

confirm that a monotonic increase in regret intensity is generally evident for both action, F (1, 209) = 8.46, p =.004, η^2 = .04, and inaction regrets, F (1, 239) = 22.58, p <.001, η^2 = .09. Interestingly, the effect is considerably greater (and the graph considerably closer to a smooth linear increase) for inaction regrets than for action regrets, in direct contrast with the results for short-term action and inaction regrets in the previous chapter.

Further planned comparisons showed significant differences between DPTR groups for *inaction* regrets only; greater regret is felt for orientation-inconsistent decisions, rather than orientation-consistent, for both ego-proximal, F (1, 239) = 8.71, p = .003, η^2 = 0.04, and ego-distal justifications, F (1, 180) = 9.62, p = .002, η^2 = 0.04. Non-significant results for the fourth and fifth planned comparisons for both action and inaction regrets indicates that unjustified decisions differing in decision-orientation generate *equivalent* regret intensity, and unjustified decisions generate no more regret intensity then justified decisions irrespective of decision-orientation for both action and inaction regrets.

A Summary of Results for Long-Term Regrets

Action and Inaction Regrets

The results for long-term action and inaction regrets offer some confirmation and some contradiction of the temporal trend for long-term regrets claimed by Gilovich and Medvec (1994). While overall the pattern of action and inaction regret frequency did not conform to that predicted by Gilovich and Medvec, action and inaction regrets were equally frequent for younger adults while older adults had more inaction regrets suggesting that a temporal trend for regret frequency may exist but is subject to an 'age-threshold'. In contrast to the results for regret frequency, action regrets were actually considered more intense than inaction regrets, and the results suggest that the demographic differences evident in the intensity of action and inaction regrets were likely the result of a strong gender effect.

The temporal theory of regret does not account for variation in the frequency action and inaction regrets evident within life domains, nor does it explain the lack of difference in the intensity of action and inactions within these domains. *Intimate* life domains produced more frequent and more intense regrets suggesting that the frequency and intensity of long-term regrets more likely reflects the substance of the issue at stake rather than the simple distinction between action and inaction.

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Decision-Orientation and Decision-Justification Concepts

Orientation-inconsistent decisions are more intensely regretted, are hotter, more wistful, more despair-inducing, and involve greater perceived responsibility than orientation-consistent decisions. Furthermore, the influence of decision-orientation on regret intensity is independent of a general preference for consistency. Mirroring the result for short-term regrets, there was no perceived difference in the subjective strength of ego-proximal and ego-distal decisions for long-term regrets. However, ego-proximal justifications inspired *less* regret than either ego-distal justifications or unjustified decisions which somewhat supports the trichotomising of justifications in the DPTR. A small but significant categorical relationship exists between decision-orientation and justification type such that the numbers of orientation-inconsistent decisions rose with a transition in justification type from ego-proximal through to a lack of justification. Furthermore, ANOVA results confirmed that both decision-orientation and decision-justification influence regret independently, but no interaction effect exists, which confirms that both concepts accounts for change in regret intensity but may work together in the manner predicted by the DPTR model.

The DPTR Model

Almost all the patterns predicted by DPTR were supported: Mean regret intensity increased monotonically across DPTR groups, ego-proximal justifications and unjustified decisions were both more intensely regretted if they were orientation-inconsistent rather than orientation-consistent, and unjustified decisions were more intensely regretted than justified decisions. However, analysis of the DPTR predictions for action and inaction regrets independently indicates that these regret-types might differentially utilise the DPTR processes. Although the predicted monotonic increase across DPTR groups is evident for both action and inaction regrets, only inaction regrets showed further expected group differences (mainly driven by decision-orientation group differences) while DPTR processes did not significantly produce any further group differences in the intensity of action regrets.

CHAPTER 9.
DISCUSSION

Regret is common and our knowledge of regret is based primarily on theories of economic decision-making. Such theories do not readily apply to regrettable decision-making in real-world settings because they: (1) are derived from experiments that do not reflect daily decision-making contexts, (2) promote simplistic factors (e.g., a distinction between action and inaction) as central to regret while neglecting the role important 'human' factors (e.g., goals, values) play in dictating decision-making in the real-world, and (3) neglect the influence of commonly used intuitive decision processes. In response to the shortcomings in previous theories of regret intensity, I proposed the Dual Process Theory of Regret (DPTR) which is based on the notion that we use both intuitive (implicit) and analytic (explicit) cognitive processes in daily decision-making and the operation of these processes will impact on feelings of regret we may experience for these decisions.

The current study compared the effectiveness of the DPTR in predicting variation in regret intensity against two currently popular theories of regret: Gilovich and Medvec's (1994) temporal theory of regret (a theory derived from economic decision-making research) and Connolly and Zeelenberg's (2002) Decision Justification Theory (which served as the basis for aspects of the DPTR). The results of this study are at odds with the currently acknowledged themes in the regret literature and suggest that the time has come to review our understanding of the factors influencing regret in everyday decision-making outside the laboratory.

Regret for Things We Do and Things We Don't Do

Gilovich and Medvec's (1994) temporal theory of regret predicts that decisions for action are more 'regrettable' than decisions for inaction in the short-term, while in the long-term the opposite holds true. Though it is a very influential theory debate still reigns as to whether this theory more accurately describes the *intensity* or *frequency* of these regrets (see Feldman et al., 1999; Kahneman, 1995). Comparing both regret frequency and intensity the current results did not support the theory of a temporal trend in either. Regrets over the things we did (i.e., action) were generally just as frequent as regrets over the things we failed to do (i.e., inaction) in both the short and long-term, which did not reflect the hypothesised temporal trend. When regrets were compared across life domains in both the short and the long-term some decisions simply more often reflected lost

opportunities (e.g., Education and Family domains), others more often reflect mistaken actions (e.g., Intimate Relationships), and decisions involving intimate affairs were always more frequent than those for non-intimate affairs. This suggests that the *content* of the regrettable decision rather than whether we chose to do something or not was a more important determinant of the likelihood of remembering a regrettable decision.

The only evidence for any form of temporal effect was that older adults regretted their lost opportunities more often than their mistaken actions in the long-term, suggesting that any temporal effect on the frequency of action and inaction regrets is age-related. Gilovich and Medvec (1994; Study 2) found a similar (albeit non-statistically significant) trend and two further pieces of evidence support such an age-related temporal effect. First, Lecci et al. (1994) found that regret over not having pursued important goals (i.e., inaction) increases with age. Second, a review of past studies shows that 72% of the regrets of Baum's (1999) elderly sample (mean age 81), 78% of the regrets of 'Terman's geniuses' (mean age 74; see Hattiangadi et al., 1995), and 74% of the regrets of Gilovich and Medvec's (1994) 'older' college professors and nursing home residents were for inaction. In contrast only 61% of the regrets of Gilovich and Medvec's youngest sample (undergraduates and working adults), and 58% of Feldman et al.'s (1999) undergraduate student sample were for inaction. In combination with the results of the current study this suggests younger people ruminate on mistaken behaviours and lost opportunities equally, but lost opportunities tend to predominate as we age. This supports the notion I argued for earlier (see Chapter 5) that the coping mechanisms outlined by Gilovich and Medvec (1994, 1995) should reduce the availability of action regrets and increase the availability of inaction regrets over time, but that this distinction would not be apparent until later in life.

The results for regret *intensity* trends were equally unsupportive of Gilovich and Medvec's (1994) temporal theory of regret. Mistaken actions and missed opportunities were regretted equally intensely in the short-term, which contradicts Gilovich and Medvec's temporal theory but is consistent with the 'equivalent intensity' hypothesis based on work by Feldman et al. (1999) and Bonnefon and Zhang (2008). In the long-term, however, mistaken actions were more intensely regretted in the long-term than were lost opportunities, a finding which still directly contradicts Gilovich and Medvec's temporal theory but is also inconsistent with this hypothesis for equivalence. The latter finding was likely the product of a strong (and unexpected) gender effect as men regretted mistaken actions more intensely than missed opportunities while the two were of equal intensity for

women[1]. Although this was a novel result, an investigation of this gender-effect is not the intended purpose of this thesis, so this finding simply offers support for the notion that temporal theory of regret does not provide an adequate explanation of the regret intensity findings. Comparing the intensity of action and inaction regrets by life domains confirmed that the simple choice to act or not act does not explain patterns of regret intensity. Within all life domains action and inaction regrets conformed to the hypothesis for equivalent intensity both in the short and the long-term, but the results also showed that regrets over intimate affairs were more intense than regrets over non-intimate affairs irrespective of the time frame. This suggests that regret reflects what the decision was *about* (i.e., its content) rather than what the decision *entailed* (i.e., doing or not doing something).

These results in total provide for three specific statements regarding Gilovich and Medvec's (1994) temporal theory of regret; (1) the frequency and intensity of regret are two distinct concepts which do not follow the same pattern, (2) this theory is not a valid predictor of regret intensity patterns, and (3) the simple distinction between action and inaction does not provide a suitable framework within which to explain trends in regret intensity. Patterns of real-life regret intensity are simply too complex to adequately explain using a theory based solely on the distinction between decisions to do or not do something. The results of the current study indicate that a more complex theory involving (1) the action/inaction dichotomy, (2) demographic differences, (3) short and long-term time frames, and (4) considerations of life domains may be formulated to account for differences in regret intensity. It is equally arguable that the complexity of regret intensity, as evidenced in the number of variables which alter its appearance in this study, is better investigated from a higher level framework which provides insight into the individual differences which drive such complexity. The DPTR is such a framework as it accounts for the operation of implicit and explicit processes commonly used in decision-making and illustrates the role that individual values have in defining appropriate decision-making patterns.

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[1] There is no readily apparent interpretation for this gender effect because, as Roese et al. (2006) indicate, the literature on regret is relatively devoid of investigations of gender-based differences, and of the two studies that do show some gender effects one offers contradictory results and the other did not differentiate between types of regret. For example, Gilovich, Wang, Regan, and Nishina (2003; Study 2) indicated that men and women both regretted inactions "more strongly" (p. 67) than actions, while Bonnefon and Zhang (2008) found that women felt greater regret intensity than men but did not differentiate between action or inaction.

Regret as a Consequence of Thought and Feeling

The DPTR assumes that decision-makers use both implicit decision-orientation (a basic form of value system) and explicit decision-justification (a comprehensive analytical system) processes to make decisions in everyday situations. Decisions are regretted more intensely when they go against our basic value system *and* there is no way to cognitively manage that contradiction using explicitly considered justifications. The focus on decision-justification is based on prior theory emphasising justifications' importance in reducing regret (e.g., Connolly & Zeelenberg, 2002; Pieters & Zeelenberg, 2005). The focus on decision-orientation is a significant theoretical departure from the previous regret literature which, until now, has ignored the role that 'personal values' may play in generating regret. The results of the current study reveal that our decision-orientation is a *vital* factor dictating regret intensity and that decision-justification by itself is not the decisive factor that prior theories have indicated.

The Centrality of Decision-Orientation

Regret intensity levels increased as hypothesised when decisions changed from value-consistent and strongly justified through to value-inconsistent and lacking justification, and this occurred for decisions in both the short and the long-term. This finding substantiates the DPTR's contention that our basic sense in the 'rightness or wrongness' of a decision *in addition to* the explicit justifications we make for this decision shape the intensity of regret we feel for a decision. More in-depth analysis shows that it is our feelings regarding the decision rather than the justification of this decision that plays the more important role.

A decision which contradicts one's basic value system (i.e., making a decision that felt *wrong*) either in the short or the long-term generates greater regret intensity, 'hotter' and more 'despairing' regrets, and increases the feeling that the poor outcome was our own fault. This supports the hypotheses and corroborate a central tenet of the DPTR; namely, that self-consistency (i.e., consistency with ones value system) is a primary behavioural motivation and decisions which contradict this motivation for consistency will be intensely regretted. Results confirm that this effect is the result of contravening *situation-specific* values rather than general cross-situational values which supports the DPTR's claim that decisions are made in everyday situations with regard to goals generated by an 'active' rather than a 'chronic' self-concept. The results regarding the strong link

between orientation-inconsistency and a heightened sense of responsibility for the regrettable outcome also informs the research on the link between regret and responsibility (see for example Zeelenberg, van Dijk, & Manstead, 1998, 2000). Responsibility is a fundamental aspect of regret, and this sense of responsibility may stem from a feeling that one has chosen a personally inappropriate option rather than an explicit evaluation of one's role in the decision process.

The current results support the hypothesis that decision-orientation influences regret intensity independently of decision-justification, as decisions consistent and inconsistent with our orientation still differ in regret intensity despite having the same *strong* justification. This contradicts Pieters and Zeelenberg's (2005) claim that regrettable intention-inconsistency can be negated through justification (albeit a strong justification), as it shows that no amount of justification could 'cancel out' the regret from making a value-inconsistent decision. The small but significant relationship hypothesised to exist between orientation and justification processes was shown, which supports the notion that orientation-consistency is linked to the same value system (albeit an abbreviated and implicit version) as that governing ego-proximal justifications. Further analysis revealed that despite the link between these systems they still impacted regret intensity levels independently of one another, confirming the hypothesis that decision-orientation is an independent mechanism from decision-justification.

Regret has historically been viewed as the product of explicit and illogical decision-making. From Savage's (1954) *Minimax Regret* theory, through to Bell (1982) and Loomes and Sugden's (1982) *Regret Theory*, and onto more recent work such as that by Gilovich and Medvec (1994), researchers have disconnected the fundamentally *human* emotion of regret from notions of personal preferences and values. The current study shows that an implicit value-based assessment (i.e., decision-orientation) is a *better* predictor of regret intensity than an explicit analysis (i.e., decision-justification), and supports a growing number of studies highlighting the role of implicit decision processes in guiding behaviour and generating negative affect (e.g., Haidt, 2001; Higgins, 2000). This study supports a new view of regret in everyday situations as reflecting the operation of both implicit and explicit decision processes.

The State of Decision-Justification

Building on the notion that justifications vary in strength (i.e., Pieters & Zeelenberg, 2005; Shealy, 2005) the DPTR predicted that people would consider ego-proximal justifications (i.e., those based on internalised value systems) to be *stronger* than ego-distal justifications (i.e., those based on external value-systems). The DPTR also predicted that use of stronger justifications would prompt greater regret intensity than the use of weaker ones, and that the use of either form of justification would generate less regret than making an unjustified decision. The findings, however, did not closely conform to these hypotheses.

Justification strength. In contrast to the trend hypothesised, when participants were asked to rate the perceived strength of their justifications the result indicated that there was no difference in the strength of ego-proximal (i.e., theoretically strong) and ego-distal (i.e., theoretically weak) justifications in either the short or the long-term. A potential explanation for this finding is that it results from the use of a between-subjects study design which prevented direct comparisons of strong and weak justifications. Any justification for a decision judged in isolation from other justifications could be considered 'strong' as it represents some basis for our behaviour and there is no competing or defeating rationale. But based on previous regret research (covered in Chapter 3) I am aware that using a within-subjects design to explore the predicted difference in regret intensity for justification-types would likely reveal the distinction I aimed to show (see Kahneman & Tversky, 1982b), and as such to argue for its use in this instance would certainly be disingenuous.

The most likely explanation for the similarity in strength of these justifications is that – consistent with the current use of a between-subjects design - justifications simply *are* judged in isolation from one another. In real-world contexts contrasting strong and weak justifications (or indeed multiple variations on such justifications) may not be available, otherwise why on earth would someone purposely choose a weak over a strong rationale for their behaviour? We probably choose the best available justification to hand in the hope that, consistent with Connolly and Zeelenberg's (2002) thesis, any justification is a good justification. The idea that we restrict our rationalisation of a decision to a single readily available justification instead of comparing and contrasting multiple justifications has strong support from Evans, Over and Handley's (2003) three principles of hypothetical thinking: *singularity*, *relevance*, and *satisficing*. Based on a broad review of the decision – making literature they suggest that in order to make effective and efficient decisions people

only construct one mental model of a situation (i.e., *singularity*), which is triggered by the characteristics of the situation at hand and reflects a believable assessment of the situation (i.e., *relevance*), and this model is evaluated as to its suitability in meeting some but not necessarily all of the individual's relevant goals and beliefs (i.e., *satisficing*). This would certainly explain why strong and weak justifications in the DPTR are considered of equal strength as both are selected in isolation from one another and no explicit evaluation with, or contemplation of, alternate forms of justification would take place as to do so would likely take too much cognitive effort, too much time, and might result in comparison-induced indecision.

Justification and regret intensity. The combination of explicit justifications and implicit decision-orientation generated the monotonic increase in regret intensity predicted by the DPTR model, but an assessment of justifications in isolation (i.e., in the absence of decision-orientation) offered little support for the differences in regret intensity hypothesised to exist between justification types. Strong justifications were associated with less regret than weak justifications in the long-term, but there was no such difference in the short-term. When placed in a regression analysis on regret intensity alongside decision-orientation justification use influenced regret intensity decisions in the long-term but not in the short-term. These results in combination suggest that justification processes might require a considerable passage of time before their influence is felt on regret intensity.

Bonnefon and Zhang (2008) also found that justifications reduced the intensity of long-term regrets but "unexpectedly, justification did not reliably affect the intensity of recent regrets." (p. 656). They suggest that a long-term time-frame may be required for such justifications to take effect because the reasoning and counterfactual evaluation associated with forming post-hoc justifications is a slow and effortful process. The 'lag' in justification effectiveness identified in both the current study and Bonnefon and Zhang's reflects the process highlighted in the social intuitionist theory of moral reasoning (Haidt, 2001). Haidt claims that moral judgements reflect quick moral intuitions of positivity or negativity and explicit justifications for these moral judgements are simply slow, post-hoc rationalisations of our initial intuition. Implicit intuitions have an immediate impact on affect and explicit reasoning only influences affect subsequent to the determination of an appropriate justification. This would explain the current results as the time-frame for short-term regrets (i.e., 6 months in this study) may not be adequate for the development of a suitable justification (or for the justification to have an effect), but the long-term time-

frame allows extensive contemplation of our behaviour and the ability to establish a suitably robust and effective justification.

A further result regarding the trichotomization of justifications is that strongly justified decisions generated less intense regrets than unjustified decisions in both the short and long-term, while weakly justified decisions and unjustified decisions generated the *same* level of regret intensity. While this result does not match the hypothesis that all three levels of justification – strong, weak, and none – would generate different levels of regret intensity, the general trend still supports the DPTR's claim that, in contradiction to Connolly and Zeelenberg's (2002) assumption, *any* justification will *not* be sufficient to quell regret. A hierarchy of justifications exists whereby those based on internalised values offer greater protection from regret, but rather than weaker justifications offering *less* protection from regret they simply offer *no* protection. Instead of a clear distinction between strong, weak and no justifications, there appears to be some form of threshold on the continuum between strong and weak justifications where justifications start to influence on regret intensity.

A third result of concern was the finding that the distinction between a justified and an unjustified decision does not have as large an effect on regret intensity as previously envisaged. In the short-term there was no difference in the level of regret intensity for a justified compared to an unjustified decision, and although justified decisions generated less regret than unjustified decisions in the *long-term* this difference was very small. The justification concept in the DPTR is based on Connolly and Zeelenberg's (2002) work on DJT which claims that any justification will reduce the regret experienced over a poor outcome as justifications provide a rationale for our behaviour and said behaviour is therefore considered (to some degree) logical and appropriate. The current findings raise questions over whether justification has any substantial impact on real-life decision situations, and indicate that any effect of justification is best viewed in combination with differences in decision-orientation. Connolly and Zeelenberg's predicted relationship between justification and regret is actually better illustrated by the results for hot emotions; unjustified decisions were much hotter than justified decisions in both the short-term and the long-term. This suggests that justifications may have more of an impact on levels of hot, self-damning, anger-related emotions rather than the cooler reactions associated with contemplative regret.

A Summary of the DPTR Status

The results of the current study offer unequivocal support for the role that decision-orientation plays in generating regret intensity, and support for the role of justification is more limited. The finding of an upward trend in regret across DPTR groups supports the notion that dual-process systems operate in everyday decision-making work and supports the sub-categorisation of both DPTR systems (i.e., the dichotomy of decision-orientation and trichotomy of decision-justification). The small but significant associations between orientation and justification processes show that they share the same root value system (i.e., orientation-consistent decisions tend to be strongly justified, while orientation-inconsistent decisions do not). This shared system means that orientation-type and justification-type can be matched (i.e., the same value that drives system 1 exemplar responses and is the basis for a system 2 justification). The limited strength of the relationship means that mismatches can also occur such that orientation-consistency can occur in the absence of any justification, or, ego-proximal justifications can be used to justify orientation-inconsistency. This mismatch is also illustrative of the DPTR model and highlights why regrets vary in intensity between individuals.

Broader Application of the DPTR

Regret research generally reflects consequentialist models of human reasoning, with regret characterised as a by product of losing the optimum outcome, but the current results suggest that regret is more than the product of such loss. A deontological view of decision-making is more appropriate for understanding differences in regret, whereby personal rules - rather than axiomatic rationales - permit certain behaviours and prohibit others and contravening these prohibitions will result in regret. This study now forms part of a growing body of work in the social and decision-sciences which refutes the assumption that human decision-making is bound by axioms of logical choice and helps illustrate the complexity we bring to everyday decision-making situations. Decision-making is not simply an analytical review of the utility of specific decision options but involves personal feelings of right and wrong. This information is useful in helping everybody develop very simple pathways to better decision-making (i.e., if it feels wrong then don't do it!) and can also be used to provide a new interpretation for a range of seemingly unrelated research on, and real-life instances of, regret.

Reinterpreting Past Research on Regret and Decision-Making

The theory that we make decisions based on feelings of right and wrong rather than relying on the economic utility of an outcome sheds new light on existing literature regarding research both within and beyond the realm of regret. For instance, the importance of our implicit, feeling-based decision-guide could explain the inability of research using artificial vignette-based scenarios to adequately forecast experienced regret (see Gilbert, Morewedge, Risen, & Wilson, 2004; Sevdalis & Harvey, 2007). The use of an implicit decision-process requires in situ activation of an 'active' self-concept, but vignette-based regret research fails to initiate any such process as the individual is not actually immersed in a relevant social context before being asked to anticipate either an agent's or their own potential level of regret. Despite being asked the level of regret *you* would feel, the judgement of anticipated regret intensity is solely determined by an explicit justification-based decision processes with little regard to the fit between the decision itself and one's personal situational orientation. This view of decision-making and regret contrasts markedly with the current results which highlight the key role that implicit decision processes play in real-life decision-making, and the distinction between predicted and experienced regret in previous regret research can likely be explained by the different decision systems employed across these two situations.

The strength of the implicit decision process in guiding behaviour and generating regret could also help explain relatively anomalous findings from previous research unrelated to the regret literature. For instance, the Stanford Prison Experiment (Haney, Banks, & Zimbardo, 1973) illustrates that hierarchical social contexts can induce normal people to commit abnormal acts (see Zimbardo, Maslach, & Haney, 2000), specifically highlighting the speed with which 'normal' people can become particularly menacing 'guards'. Little known is the fact that a number of the guards in the original study were actually considered 'good guards' by the prisoners (i.e., reluctant to treat the prisoners harshly) and felt enormous conflict over their perceived roles as 'aggressors'. One guard remarked "What made the experience most depressing for me was the fact that we were continually called upon to act in a way that just is contrary to what I really feel inside . . . it just didn't seem like me" (quoted in Wielenberg, 2006; p. 482). This is a perfect illustration of the fundamental role that implicit decision processes play in guiding our behaviour and the fact that the 'good guards' contradiction of what they *felt* was appropriate resulted in tremendous regret for their behaviour.

The DPTR can also help explain both the emotional discontent and lack thereof experienced by participants in Stanley Milgram's obedience research studies. Most of us believe that we are fair, just, and kind, so to willingly shock another human being, even a stranger, to the point of death seems extremely inconsistent with the humanitarian aspects of our self-concept. Indeed, post-experiment participants in this study "took pains to point out that they were not sadistic types" (Milgram, 1963, p. 375), indicating that they were aware that their actions were inconsistent with their normal orientations. However, over half of the participants proceeded to administer shocks to the limit of 450 volts, clearly justifying their behaviour on an exogenous basis; the instructions of a perceived authority figure. The tension, emotional volatility and regret expressed by some of Milgram's participants is clearly the result of behaving inconsistently with their decision-orientation and only having an exogenous justification (i.e., the instructor told me too) for their decisions.

Interestingly, Milgram notes that when one participant, who had expressed no regret for his actions, is reminded that the 'stooge' could have died as a result of his decision to continue shocking him this participant replied "So he's dead. I did my job!" (Milgram, 1974, p. 88). His lack of regret is understandable in the light of earlier comments he made regarding his performance in the study, stating "I conducted myself behaving [sic] and obediently, and carried on instructions as I always do...I think I did a good job" (Milgram, 1974, p. 88). This indicates that in situations where authority figures are dictating orders he is implicitly oriented to obediently comply, and can offer the explicit justification that authority figures are to be obeyed. This is certainly a situation where one's implicit orientation is in accord with a strong explicit justification, so it is no wonder that he experiences no regret!

Understanding Regret in the Media

Revelations of the abuse of prisoners of war at Abu Ghraib prison sparked public outrage, but – abuse aside – this event provides a perfect test of a theory to account for variation in the regret expressed by the abusers. Connolly and Zeelenberg's (2002) DJT suggests that if both abusive guards had justifications for their behaviour then neither should express regret over their decision, though some regret may be felt for the outcome (i.e., they were caught and punished), and a military structure based on strict adherence to a chain of command offers just such a justification. Despite the clear justification that all military

personal had for committing such an offence there was still considerable variation in the level of regret expressed by those convicted of the abuse. For instance, Sergeant Michael Smith and Staff Sergeant Ivan Frederick were both convicted of participating in the abuse and humiliation of prisoners of war, but while Frederick expressed regret for his role in the abuse ("Abu Ghraib prison soldier admits guilt", 2004), Smith expressed no regret at all (Courson, 2006). DJT cannot therefore account for the difference in regret these men express, but the DPTR can because it recognises that individuals have different underlying value structures and what may seem like an appropriate justification for one person will not be appropriate for another.

Smith's lack of regret might be seemingly abhorrent to the rest of the populace, but it is understandable if you consider that the internalisation of military values may have altered his perceptions of what is appropriate and what is not. The military institution emphasises values, such as obedience to authority, as integral to the model soldier and necessary to the maintenance of the greater organization. In career soldiers such external values may become internalised, thereby assimilating themselves into one's self-concept and generating exemplar behaviours for specific situations (e.g., managing prisoners) that correspond with this new value. This process then facilitates commitment to behaviour that may once have been considered inconsistent with our orientation. Soldiers who have internalised these common military values may therefore consider their mistreatment of prisoners as orientation consistent, and can find a key internalised value, such as obedience to military authority, as the basis for an endogenous justification. In this manner Smith may have had both a strong feeling that what he was doing was right and could clearly indicate a strong justification for undertaking his abusive acts.

Fredericks in contrast was provided the same justification to commit abuse but, though he went onto abuse, he expressed regret for it. This suggests that the military value structure may have been accommodated by Fredericks but did not override his pre-existing notions of right and wrong. His behaviour in this respect may have substantially deviated from what he considered *right* (System 1: orientation-inconsistent), and evidence suggests that it took part in an environment characterised by considerable peer pressure (System 2: exogenous justification). The combination of orientation-inconsistency and an exogenous justification would certainly generate a considerable amount of regret.

Results that Alter Our Understanding of the DPTR

Hot, Wistful, and Despair Emotions

In both the short and the long-term orientation-inconsistency (i.e., choosing the wrong option) generated 'hotter' regrets than orientation-consistency, supporting the hypothesis that hot emotions reflect many of the facets associated with system 1 processing (i.e., activated by negatively-valenced events, involve transgressions of personal principles, are often implicit and conditionally triggered). However, unjustified decisions were also 'hotter' than justified decisions in both the short and long-term (an unexpected result) which does not support the assumption that decision *heat* is related to system 1 processing, suggesting instead that regret heat is simply a close proxy of regret intensity. Wistful and despair emotions were hypothetically related to poorer justification based on the assumption that wistful and despair emotions (e.g., contemplation, longing) utilise cognitions reflective of system 2 processing (i.e., they require explicit analysis and contemplation of counterfactuals). However, levels of wistfulness and despair were equivalent across all three justification levels in both the short and the long-term, but (unexpectedly) despair in the short-term and despair and wistfulness in the long-term were greater for orientation-inconsistent decisions. These results do not support the hypothesis that wistfulness and despair are associated with lower quality of analytical thought (in the guise of poorer justification), suggesting instead that they are prompted by the ongoing contemplation of making a decision that simply *felt* inconsistent with one's self-concept.

Time Frames and the Effectiveness of the DPTR

One of the major findings in this study was that the DPTR more closely modelled the patterns of regret intensity for long-term rather than short–term decisions, and this outcome was likely the result of the null-effect for justifications in the short-term. This constrains the application of the DPTR and situates it as a model that best reflects the processes involved in long-term assessments of regrettable decisions. Short-term assessments of regrettable decisions may use a much more abbreviated cognitive process favouring phenomenological indications of right or wrong as core standards against which to judge the appropriateness of our behaviour.

The Action/Inaction Dichotomy and the DPTR.

The DPTR trends in regret intensity were hypothesised to exist irrespective of whether the decisions were for action or inaction, as the DPTR was assumed to model the decision-making behaviour in *all* decision situations. The hypothesised increase in regret intensity across DPTR groups was evident irrespective of whether the decision was for action of inaction and whether it occurred in the short or the long-term. Further analysis, however, revealed that decisions for action or inaction were differentially linked to the DPTR's dual processes, and this association changed over time. In the short-term the increase in regret intensity across DPTR groups was much stronger for *action* than for inaction regrets, primarily because the intensity of short-term action regrets was strongly influenced by justification type while inaction regret intensity was not. In the long-term however the DPTR trends were stronger for *inaction* regrets because the intensity of inaction regrets was more sensitive to changes in decision-orientation and justification while the intensity of action regrets was not. These relationship between action regrets and justifications in this study contrasts with those of Bonnefon and Zhang (2008) who found that justifications influenced the intensity of action regrets only in the long-term.

These findings pose two specific problems for the DPTR. First, they suggest that decision-orientation and decision-justification process do not have an equivalent impact on decisions for action or inaction. This is unexpected given that the DPTR processes were envisaged as applicable to all decisions irrespective of whether they were for action or inaction. This indicates that the post-hoc evaluation of actions and inaction focus on different aspects of the decision process. The intensity of action regrets is driven by the availability of justifications in the short-term but not the long-term. In contrast both orientation and justification processes only impact on the intensity of inaction regrets in the long-term, presumably as a result of the increase in contemplation and rumination that time affords. Second, these findings indicate that the dual processes inherent in the DPTR have a time-related impact on the intensity of action and inaction regrets in the manner predicted by Gilovich and Medvec's (1994) temporal theory of regret. This is surprising given that prior results lead to the discounting of Gilovich and Medvec's theory as an effective predictor of overall regret intensity, but illustrates that the concepts of time and regret-type may influence regret intensity in an indirect manner by sensitizing decision makers to certain factors in the decision process at specific points in time (i.e., inactions and justifications in the long-term).

Limitations of the Study

Measurement of Decision-Orientation

The measurement of decision-orientation in this study may be a limitation and this has implications for the characterisation of decision-orientation as an implicit cognitive process in the DPTR. One's decision-orientation is conceptualised as an unconscious decision guide favouring exemplar responses which are promoted by specific situational triggers, a conceptualisation that by its very 'implicit' nature makes it hard to effectively measure. This study utilised a postal survey to access real-life regrets and determine one's decision-orientation, quantifying orientation-consistency by whether the decision in question corresponds with the 'personal life rules' participants feel that they use to guide their decision-making. All care was made to help induce the phenomenological experience of the decision-situation, but the categorisation of one's decision-orientation necessarily involved an explicit judgement on the nature of an implicit process which occurred in a situation anywhere from one day to 80 years prior to questioning. The measurement of decision-orientation in this manner may not reflect accurate reporting of the operation of an implicit, situation-specific cognitive process as it occurred at the time of the decision, but may instead provide an indication of whether the decision in question transgresses participants' *current* life rules.

However, there are good grounds to suggest that the current measurement of decision-orientation *is* appropriate and is likely to reflect the phenomenological aspects it is targeting. First, participants in this study were asked to recall and answer questions on the greatest mistake of their life, and it is likely that constant rumination and contemplation of different outcomes over the years has created a very accurate and robust memory of the event. Schacter (1999) states that one of the seven 'sins' of memory is 'persistence', claiming that people can recall memories of events very accurately despite the passage of time, and this is especially true of negative emotional experiences.

Second, recall of such vivid negatively-valenced memories is likely associated with a 're-experiencing' of the phenomenological experience associated with this memory. Research shows that autobiographical memory recall activates the prefrontal cortex which is central to experiencing somatic and sensory experiences (see Botzung et al., 2008; Schacter et al., 2008; Conway et al., 2001), and this induces a 're-experiencing' of the sensory and somatic experiences associated with the specific memory (Conway, 2001).

Third, although current moods can definitely influence the selection of past memories (see Schacter, 1999), they do not change the valence or the phenomenological 'signature' associated with these memories (Boyer, 2008). Prominent life regrets and their associated somatic experience are therefore likely to be accurately stored in memory, can be easily recalled, and there will be little distortion of their associated phenomenological experience. This indicates that the decision-orientation activated by the original decision situation is likely to be re-activated on recall of this memory, and there is little concern that the measurement of this orientation reflects current life rules in this study.

Measurement of Decision-Justification

The lack of a difference in regret intensity between ego-proximal and ego-distal justifications is surprising given the strong theoretical and empirical support for such a distinction, but the lack of difference in regret intensity may have been the result of imprecise measurement of justification strength. First, in order to categorise individuals into justification groups this study generated a dichotomous indicator of justification strength - either strong or weak - which, compared to an interval-level variable, reduces potential variability in justification strength and, consequently, our ability to find associations between justification strength and related factors. Second, the concepts of ego-proximal and ego-distal justification are not empirically validated, being developed for the purposes of the DPTR. While they may make intuitive sense they may not directly reflect what are naturally considered 'strong' and 'weak' justifications respectively. The only counterpoint to these criticisms is the finding that the monotonic increases in regret intensity predicted across DPTR groups are evident in both the short and the long-term. Even if current measurement has restricted the natural variation in justification strength, the resulting variations in justification in the full DPTR model still adhere to initial predictions.

Future Research

Accurate Measurement of Decision-Orientation

The current study found that regret intensity was primarily driven by differences in our implicit, situation-specific, decision-orientation but the measurement of decision-orientation in this study was post-hoc (in most cases by many years) *potentially* leaving this concept open to alternative interpretation. A further study is therefore required to assess whether our decision-orientation is really situation-specific and whether regret really is determined by situation-specific feelings of 'rightness' or 'wrongness'. There is scope for undertaking such a study with the use of handheld PDA's (personal digital assistants) which would reveal a large amount of information on the daily decision-making factors that result in instances of regret. The use of handheld PDA's to conduct assessments of daily decision practices is increasingly common (see Bass, Linney, Butler, & Grzywacz, 2007) as it allows point-in-time 'experience sampling' of the thoughts, feelings and behaviours that individuals experience and enact in everyday decision-making contexts (see Christiensen, Barrett, Bliss-Moreau, Lebo, & Kaschub, 2003).

This research would provide in-depth information on the in situ thoughts and feelings driving individual decision-making practices and a post-hoc assessment of a poor outcome resulting from these decisions would indicate whether such thoughts and feelings are a primary determinant of regret. The use of PDA's would also have the added ability to investigate whether the phenomenological experience associated with memories of regrettable events is stable over time, or whether the passage of time does distort this recall.

Justification Strength

The current results showed that justification has little practical impact on regret intensity but it is unclear whether this was because strong and weak justifications really are considered similar in strength or whether the method utilised was not sensitive to real differences in strength. This finding warrants further investigation because it has serious implications for the way in which human decision-making is currently understood. Decision-making research is founded on the notion that justification is a central process in everyday reasoning, and justification is therefore a key factor in decision-making theory; for example, in escalation of commitment theory (Staw, 1976; Staw & Fox, 1977), cognitive dissonance

theory (Aronson, 1995, 1999), the theory of medical decision making (Grundstein-Amado, 1992). Justification is such a well utilised concept that it has even generated its own stable of theories; for example, decision justification theory (Connolly & Zeelenberg, 2002), system justification theory (Jost & Banaji, 1994; Jost, Banaji, & Nosek, 2004), the justification hypothesis (Henriques, 2003), and theories of justification strength (Goldman, 1988; Stich & Nesbit, 1980). If this study's characterisation of justification is correct and measurement of justification is accurate then the current findings question the utility of the justification concept as a primary director of behaviour in real-world settings and also as a primary influence on subsequent emotional reaction.

As the direct contrasts associated with within-subjects designs tend to produce the trends expected (i.e., ego-proximal justifications will likely be considered stronger than ego-distal justifications; see Kahneman & Tversky, 1982b) an investigation into the utility of justification strength could employ a recently modified version of the current between-subject methods, called the *common reference method* (see Zhang, Walsh, & Bonnefon, 2005). Instead of simply assessing justification strength in isolation from other decisions (which may have lead to the current findings) each individual first provides an indication of the justification strength for a common hypothetical decision, then rates the strength of the justification for their own decisions. The initial assessment of justification strength for the hypothetical decision essentially serves as a standard against which all the regrets are then assessed in common, as justification strength is then measured as the difference between the rating of their own justification strength and the rating they provided for the common hypothetical decision-maker.

This type of study would clarify two key questions surrounding justification use in regrettable decision-making; (1) it would provide a better measurement of whether ego-proximal justifications are considered stronger than ego-distal justifications, and (2) it would also indicate whether this difference (if it does exist) generates differences in regret intensity. Any apparent differences in regret intensity would indicate that the results of the *current* study were a consequence of the method employed rather than the lack of effect for justification strength.

Regret for Intimate Things

The current study found that decisions involving intimate life domains (e.g., sleeping with your friend's wife) were more intensely regretted than those involving non-intimate life

domains (e.g., choosing the wrong career). But why would the former be more strongly regretted than the latter? We care about both decisions, both will result in self-criticism, and both may have long-term impacts for ourselves and others. Roese and Summerville (2005) proposed that life domains which are 'high in opportunity' (i.e., there is ample opportunity to 'right-the-wrong') will generate greater regrets than those that are 'low in opportunity' because regret spurs corrective action and where such action is possible but not undertaken we regret not only for the poor outcome but our lack of commitment to redress the outcome. But Roese and Summerville's theory does not explain the results of the current study as some of the domains they characterise as high opportunity (e.g., romance and education) and low opportunity (e.g., family and career) contrasts with the current study's categorisation of intimate (e.g., romance and family) and non-intimate (e.g., education and career) life domains.

One alternative explanation for this finding is that, because of the differences in frequency with which we encounter them in everyday life, these two different life domains are dealt with by two different cognitive systems – one implicit and one explicit. Intimate life domains (i.e., interactions with partners/family/friends, and perceptions of self-performance) reflect factors that are not only vitally important to us but are those that we commonly experience in everyday life. This familiarity should rapidly promote the development of situation-specific exemplar responses meaning we will be much more inclined to use an implicit, feeling-based, cognitive system when dealing with intimate decisions. One's response to decisions involving intimate life domains should therefore be semi hard-wired, and reflect an intuitive understanding of right and wrong. Non-intimate life domains (e.g., education, career) often reflect factors which, if not novel, then are certainly those which we do not necessarily encounter with such frequency. Exemplar responses for non-intimate life domains will not be as well established and we will likely rely on more explicit analysis of the decision and context when making decisions within these domains. In this manner one's response is not likely to reflect the intuitive feelings of right-or-wrong to as great an extent and any feelings of regret may take time to reveal themselves.

This hypothesis assumes that individuals differentially employ implicit and explicit decision processes depending on the life-domain which the decision reflects, so a direct test of this theory should take the form of a within-subjects assessment of participants' greatest regret from an intimate life domain and their greatest from a non-intimate life

domain. Such a comparison would ensure that any *inter*-individual variation in reliance on implicit and explicit process use is controlled for, therefore clarifying whether any differences in regret intensity for individuals' intimate and non-intimate regrets are because of *intra*-individual process use.

Sex, Drugs, and Recidivism

In addition to furthering our understanding of regret, the current results also have wider application for understanding human behaviour. In chapter 4 the DPTR was compared to Connolly and Zeelenberg's (2002) DJT and Pieters and Zeelenberg's (2005) DJT-variant in its ability to predict the regret resulting from a drink driving scenario. This showed that the difference in regret experienced by recidivist and non-recidivist drink-drivers was accounted for by the DPTR. It also illustrates a key link between regret and any form of recidivist offending; if the behaviour does not feel wrong (i.e., there is no regret) then they will not stop.

Regret is central to our desire to change aversive behaviours (see Blume & Schmaling, 1996), and its expression implies an understanding of the impact that this behaviour has had on others and ourselves, and the desire to avoid this mistake in future acts as a key motivator to change. For instance, Blume and Schmaling (1996, 1998) found that regret was a key factor in the decision to change drug abuse behaviour; those with no regrets felt little compulsion to change while those with many regrets were much more likely to change their behaviour. Although the expression of regret is a primary prerequisite for entry to most offender treatment programs (Ward, Day, Howells, & Birgden, 2004), research shows that offenders' expressions of regret can be offered based simply on social expectation or self-concern rather than as a true indication of sorrow for their victims (Bijleveld & Henriks, 2003). Little wonder then that many people who enter treatment programs – for behaviours ranging from alcoholism through to sex offending – still fail to complete treatment (see Kelly & Moos, 2003).

Because the DPTR treats regret as varying in intensity rather dichotomously (regret/no regret) it has greater application than any other regret theory in highlighting those likely to successfully finish treatment programs and those likely to reoffend. Treating all regrets as similarly motivating for the purpose of promoting change ignores the idea that variation in regret intensity should be mirrored by variation in recidivism. Those higher in regret intensity will more likely be amenable to changing their behaviour because this

behaviour is likely based on a contradiction of personal values, is therefore recognised as feeling wrong, and cannot be justified to any extent. Those who feel little or no regret for their recidivism will be the least likely to successfully seek out and complete treatment programs as they feel that the behaviour is not wrong (i.e., it does not conflict with any personal value system) and is justifiable to themselves.

A direct test of this hypothesis requires exploring the basis for the offender's regret rather than simply acknowledging that regret has been expressed. This involves exploring phenomenological aspects of the offending experience (i.e., did it feel right or wrong or contradict any pertinent life rules?) and identifying the nature of any justification offered for the offence (i.e., were personal or external value-systems involved?). Applying the DPTR model to criminal offenders would allow streaming of offenders into treatment programs based on regret *intensity* rather than mere expression. This would in turn (1) identify those most unsuitable for treatment (i.e., no regret), (2) identify those whose regrets mean they are most likely to re-offend or to drop out of treatment (i.e., those for whom regret is low), and (3), reduce treatment drop-out rates and increasing treatment effects by focussing efforts on those who are most likely to benefit (i.e., those high in regret intensity).

Conclusion

From our first kiss to our last whiskey, we provide ourselves ample opportunity to make the wrong decision, to steer our lives down unexpected paths and to ultimately ponder "what if...?" But as much as regret hurts we have learnt to embrace it and use it not only as a decision-making guide but as an integral aspect of our social interaction. In an attempt to expand on our understanding of regret this thesis was shaped by two key questions; (1) what constitutes the experience of regret?, and (2) what are the key factors that generate regret intensity? Having assessed the components of an emotional episode which are present and those that are absent in the experience of regret (see Chapter 2), I can answer the first question. Having compared the utility of two past theories of regret and a new Dual Process Theory of Regret (the DPTR) in predicting regret intensity patterns I can also answer the second question.

What Constitutes the Experience of Regret?

Regret is an unpleasant emotion that we experience when we make a personally meaningful decision whose outcome compares poorly to that of another option. This failure impedes our goal attainment and entails negative personal consequences, may produce harm for self or others and occurs irrespective of whether the decision entailed moral transgressions. The experience of regret is characterised by feelings of self-condemnation, a desire to undo the wrong, and an urge to remedy the situation, but it does not prohibit the same decision being made in future if that is in our 'best interests'. Lastly, the experience of regret lacks any characteristic impulses (e.g., to run or hide), any conscious physiological response (e.g., to urinate or vomit), and is not linked to any characteristic expression (e.g., a smile or a frown). In essence the experience of regret reflects the operation of critical self-analysis, resembles a 'phantom' emotion whose lack of overt characteristics hides it from the notice of others, and represents equal measures of pragmatism, self-interest, and self-blame.

What are the Key Factors that Influence Regret Intensity?

Regret intensifies when making what *feels* like the wrong decision for you, as this involves contradicting your strongly held values or belief systems pertinent to the situation at hand. Over the course of time justifications will play a small but significant role in reducing regret; justifications that are based on adherence to strongly held values will shield you from regret more so than a justification which is based on external value-systems such social norms or peer pressure. This study provides a very clear and simple pathway for avoiding regret: if it feels wrong then don't go ahead with it! Whether these feelings are ultimately signalled by intuitive feelings of negativity about a choice, or whether one can find an explicit justification for avoiding this option, regret is bound to ensue if your shun these personal guides. Variation in your adherence to these two decision guides will result in variation in the level of regret you feel; least regret will be felt for decisions which feel right and find justification in your strongly held values, while the greatest level of regret is reserved for unjustified decisions that also felt wrong to begin with.

In his famous song "My Way" Frank Sinatra claimed to have few regrets in life because everything he did he did it 'his way'. While I would like to think his argument is not as well theoretically supported as my theory, our two views share the same common

thread: base your decisions on your strongly held values or you will likely make decisions which you will regret for the rest of your life.

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APPENDICES

APPENDIX A.
PRIMARY LETTER OF INVITATION TO PARTICIPATE IN THE STUDY

School of Psychology
Te Kura Hinengaro Tangata
Private Bag 11 222
Palmerston North
New Zealand
T 64 6 350 5799 extn 2040
F 64 6 350 5673
www.massey.ac.nz

<Address line 1>
<Address line 2>
<Address line 3>
<Address line 4>

Dear <participant name>

A few days from now you will receive a request to fill out a brief questionnaire for an important research project. This research, which looks at the development of life regrets and how they impact on our current wellbeing, is being conducted in the School of Psychology at Massey University.

Emotional health and wellbeing is an issue that is important to all New Zealanders. As our understanding of the factors that affect our emotional health and wellbeing increases, it is becoming clear that our regrettable decisions from the past can have a serious impact on how we feel today. However, little research has been conducted which looks at how short-term and long-term regrets develop, and assesses the level of impact each still has on our lives. This research, which is part of my doctoral study, is seeking to increase this understanding.

I am writing to you in advance because we have found that many people like to know ahead of time that they will be contacted. You will receive more information about the research with the questionnaire. However, if you have any immediate questions or concerns about the study I can be contacted as per the details listed below or Dr Ross Flett, who is supervising this research, can be contacted by telephoning (06) 356 9099 (extn. 2051).

Thank you for your time and your consideration of this request.

Andy Towers
Doctoral Researcher
Ph: (06) 356 9099 (extn. 2046)
Email: A.J.Towers@massey.ac.nz

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APPENDIX B.
SECONDARY LETTER OF INVITATION TO PARTICIPATE IN THE STUDY

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Private Bag 11 222
Palmerston North
New Zealand
T   64 6 350 5799 extn 2040
F   64 6 350 5673
www.massey.ac.nz

<Address line 1>
<Address line 2>
<Address line 3>
<Address line 4>

Dear <participant name>

Emotional health and wellbeing are important to us all, and it has been shown that the level of regret we have over past decisions affects our current level of emotional health and wellbeing. However, the nature of short and long-term regrets, and their related emotional reactions is not well understood. This research is seeking to more fully understand this.

My name is Andy Towers and I contacted you within the last two weeks regarding taking part in my research on life regrets. This research is part of my doctorate I am conducting in the School of Psychology at Massey University. Dr Ross Flett, who is supervising this research, and I would like to invite you to participate in this research that aims to more fully understand the nature of life regrets, the characteristics of regrettable events, and how much these events still affect people today. Participation simply involves filling in the brief questionnaire that accompanies this letter and returning it in the freepost envelope provided. This should only take about 20 minutes.

Your name was randomly selected from the New Zealand electoral roll. This is the best way to contact a broad range of people who truly represent the New Zealand citizens. All information that you may choose to give while participating in this study will be kept completely confidential. If you do not want to participate in this study then please feel free to give the questionnaire to a friend or relative who might like to participate. If you would like to receive a summary copy of the findings, these will be posted to you if you write your name and address on the slip provided at the end of the questionnaire. Please remember, if you do write your name and address, detach the slip from the questionnaire and return it separately so your questionnaire is completely anonymous. If you choose to complete and return this questionnaire I will take this as your consent to be involved in the study.

Thank you for taking the time to read this information and consider this request.

Andy Towers
Doctoral   Researcher

APPENDIX C.
MAIN QUESTIONNAIRE

School of Psychology
Te Kura Hinengaro Tangata
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New Zealand
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F   64 6 350 5673
www.massey.ac.nz

Life regrets:

What do we regret and why?
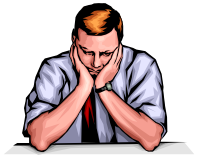
1. What is this study about and who is doing it?

My name is Andy Towers, and I am the principal investigator in the current research project. This questionnaire is part of my doctoral research looking at life regrets. I am interested in the nature of people's life regrets, the characteristics of regrettable events, and how much these events still affect people today.

My supervisor for this research is Dr Ross Flett, Senior Lecturer in the School of Psychology at Massey University. Please do not hesitate to contact either of us if you have any queries or concerns at all regarding this research. Our contact details are as follows:

Andy Towers,	**Dr Ross Flett**,
School of Psychology,	School of Psychology,
Massey University,	Massey University,
Private Bag 11 222,	Private Bag 11 222,
Palmerston North.	Palmerston North.
Ph: (06) 3569099 ext. 2046	Ph: (06) 3569099 ext. 2051
E-mail:	E-mail:
A.J.Towers@massey.ac.nz	R.A.Flett@massey.ac.nz.

2. What will I be asked to do?

If you decide to participate in this study you will be asked to answer the attached questionnaire. This questionnaire will ask about various regrets you may have and about different aspects of these regrettable experiences. This will help us understand more clearly *what* people actually regret, *why* people regret certain life choices, and *how much* these regrets still affect them today. The whole questionnaire should not take longer than 20 minutes.

When you have completed the questionnaire you can return it in the A4 size freepost envelope supplied. A second, smaller freepost envelope is also supplied so that you can request a summary of the results of the study.

3. What are my rights as a participant in this study?
- You are welcome to decline to participate in this study, to refuse to answer any question(s), or to withdraw from the study at any time.

- You are welcome to contact the researchers at any time during the study to discuss any aspect of the study you wish.

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- You provide information on the understanding that it is anonymous and in complete confidence to the researchers, and to be used only for the purpose of this research.

- You are welcome to fill in the request for feedback form to receive a summary of the results of the study upon its completion.

4. What can I expect from the researchers?

We will treat your responses with total **confidentiality** and assure you of complete **anonymity**. If we decide to publish any results these will only be in summary form. The questionnaires will be destroyed upon the completion of the study. At no time will anyone other than Dr Ross Flett and myself have access to completed questionnaires.

This project has been reviewed and approved by the Massey University Human Ethics Committee, PN Application 04/37. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Human Ethics Committee: Palmerston North, telephone (06) 350 5249, or email humanethicspn@massey.ac.nz

Please be aware that completion and return of the questionnaire implies consent to participate in the research.

Please turn to section one on the next page to begin this questionnaire.

Section One

Life Regrets

When asked, most people can recall at least one thing they did or didn't do that left them feeling regretful. This may have occurred recently or may have occurred many years ago, but they still regret it. This may also be about a *specific* event or circumstance (such as hitting a co-worker in anger) or may be about an *ongoing* event or circumstance (such as someone regretting having a gambling habit).

Please take your time and think carefully about any regrets you might have about the past.

HINT: It often helps to remember such instances by asking yourself "If I could change anything about the past what would it be?"

When you are ready, please answer the following question by circling the appropriate number:

Q 1. Looking back on your life what level of regret would you say you have?

For example, if you feel regret for many things in your life you would probably circle '5 – Many regrets'

```
1-----------------2----------------3----------------4--------------5
```
No regrets   Some regrets   Many regrets

If you circled '1' (*no regrets*) to the question above please go straight to question 19 (page 12).

Q 2. When you look back on your experiences in life and think of those things that you regret, what would you say you regret *most* (please tick only *one* option):

☐   ☐

Those things I did but wish I hadn't   Those things I didn't do but wish I had

For the rest of this questionnaire we would like you to focus upon just two regrets:
   (1) your greatest regret **from the last 6 months**
   (2) your greatest regret **from your entire lifetime**
When you have a regret in mind for both of these categories please turn the page.

Section 2:

Short Term Regrets

The following section deals with what you feel is your greatest regret from the **last 6 months**. You will be asked to describe what it was you regret and specific questions regarding how you feel about this regrettable event or decision.

Q 3. Please describe in the space below the thing that occurred in the **last 6 months** that you regret the most. (Please print clearly)

_____

_____

_____

_____

_____

_____

_____

Q 4. How much of an impact do you feel this regret has had on your life in general? Please show by circling the appropriate number:

For example, if you feel the thing you regret has really changed the way you live your life or has changed the way you make decisions, you might circle '5 – A very large impact'
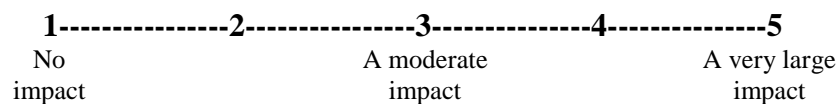
1----------------2----------------3---------------4--------------5
No   A moderate   A very large
impact   impact   impact

Q 5. How often have you thought about this regretful event or decision since it occurred? Please show by circling the appropriate number:

1----------------2----------------3---------------4--------------5
Less than   Every other day   More than
once a   once a day
week

Q 6. How intense are your feelings of regret? Please show by circling the appropriate number:

1-----------2-----------3-----------4-----------5-----------6-----------7-----------8-----------9
I don't   I regret it   I regret it quite   I regret it   I regret it
regret it   somewhat   a bit   a lot   immensely
much

Q 7. Sometimes our regrets may also cause us to experience a number of other feelings. By circling a number, tell us how often you *currently* experience each of the feelings below **when you think about the thing that you regretted the most in the last 6 months**:

	Never	Sometimes	Occasionally	Often	Always
Angry………………………...	1	2	3	4	5
Contemplative………………..	1	2	3	4	5
Empty…………………………...	1	2	3	4	5
Disgusted……………………..	1	2	3	4	5
Dreamy………………………..	1	2	3	4	5
Helpless……………………...	1	2	3	4	5
Embarrassed………………….	1	2	3	4	5
Nostalgic……………………..	1	2	3	4	5
Longing………………………	1	2	3	4	5
Guilty………………………..	1	2	3	4	5
Sentimental…………………..	1	2	3	4	5
Sad…………………………...	1	2	3	4	5
Irritated………………………	1	2	3	4	5
Wistful……………………….	1	2	3	4	5
Unfulfilled……………..………	1	2	3	4	5

Q 8. Think back to when this regrettable event or decision took place. Try to remember all the things that went through your mind. Now that you have this information in mind, please answer the following questions:

(a) How much do you feel you were responsible for this event or decision?

```
1----------------2---------------3----------------4-------------5
Not                    Somewhat                  Completely
responsible            responsible               responsible
```

If you circled **1** please go straight to question **8 (b)** on the next page.
If you circled **2**, **3**, **4** or **5** please state below *why* you feel responsible:

_____

_____

_____

_____

_____

_____

(b) At the time it happened, how justified was the event or decision?

```
1-----------------2----------------3----------------4--------------5
```
Not justified   Somewhat   Completely
justified   justified

If you circled **1** please go straight to **question 9** on the next page.
If you circled **2**, **3**, **4** or **5** please take your time to explain below *how* you justified this event or decision to yourself at the time it occurred (*i.e., what did you say to yourself?*):

_____

_____

_____

_____

_____

_____

(c) Looking back on it, how strong do you think this justification is *now*?

```
1-----------------2----------------3----------------4--------------5
```
A weak   A moderate   A strong
justification   justification   justification

(d) There are many reasons that we decide to do something or not do something that we later end up regretting. For instance, we may justify our actions or inactions in the following ways:

- *Personal Beliefs* – we believe it was right at the time
- *Situational Factors* – some other reason compels us to do it (e.g., our friends told us it was a good thing)

When you think about how you justified your action or inaction, what do you feel your justification was <u>more</u> consistent with? Please indicate by circling **<u>one</u>** of the options below:

```
1----------------------2-------------------------3---------------------4
```
Personal   Mainly personal   Mainly   Situational
beliefs   beliefs (but with   situational   factors
           some situational   factors (but with
           factors)   some personal
                          beliefs)

Q 9. Some people have personal rules, or life philosophies, that often help guide what they do. For example, some people believe that you should always think of family needs before your own, or some think that the most important thing in life is to be nice to people.

Take a minute to think about what some of your most important personal rules are. What rules help guide your decision-making?

Try to choose what you believe are some of your most important personal rules. Now that you have them in mind, compare them to the decision or event that you regret. Do you feel that the decision you made or event you experienced contradicts *any* of your personal rules? (Please tick one box):

☐   ☐
No it does not   Yes it does

Q 10. Please indicate in the space below how long ago (approximately) this decision or event took place. If you cannot remember the exact date then just indicate roughly how many *months* ago it occurred.

*For example, if the event or decision took place three and a half months ago, then you would indicate **3** months and **2** weeks.*

_____   _____
MONTHS   **WEEKS**

This is the end of section 2

Section 3

Long Term Regrets

The following section deals with what you feel is your **single greatest regret from your entire lifetime**. You will be asked to describe what it was you regret and specific questions regarding how you feel about this regrettable event or decision.

Q 11. Please describe in the space below the specific event or decision that is the **single greatest regret from your entire lifetime**. (Please print clearly)

_____

_____

_____

_____

_____

_____

_____

Q 12. How big an impact do you feel this regret has had on your life? Please show by circling the appropriate number:

1----------------2----------------3---------------4--------------5

No   A moderate   A very large

impact   impact   impact

Q 13. How often have you thought about this event or decision since it occurred? Please show by circling the appropriate number:

1----------------2----------------3---------------4--------------5

Less than   Every other day   More than

once a   once a day

week

Q 14. How intense are your feelings of regret? Please show by circling the appropriate number:

1----------2----------3----------4----------5----------6----------7----------8----------9

I don't   I regret it   I regret it quite   I regret it   I regret it

regret it   somewhat   a bit   a great   immensely

much   deal

Q 15. Sometimes our regrets may also cause us to experience a number of other feelings. By circling a number, tell us how often you *currently* experience each of the feelings below **when you think about your single greatest regret from your entire lifetime**:

	Never	**Sometimes**	**Occasionally**	**Often**	**Always**
Angry……………………....	1	2	3	4	5
Contemplative………………	1	2	3	4	5
Empty………………………...	1	2	3	4	5
Disgusted…………………….	1	2	3	4	5
Dreamy………………………	1	2	3	4	5
Helpless……………………...	1	2	3	4	5
Embarrassed………………….	1	2	3	4	5
Nostalgic…………………….	1	2	3	4	5
Longing………………………	1	2	3	4	5
Guilty………………………...	1	2	3	4	5
Sentimental………………….	1	2	3	4	5
Sad…………………………...	1	2	3	4	5
Irritated………………………	1	2	3	4	5
Wistful……………………….	1	2	3	4	5
Unfulfilled……….…..………	1	2	3	4	5

Q 16. Think back to when this regrettable event or decision took place. Try to remember all the things that went through your mind. Now that you have this information in mind, please answer the following questions:

(a) How much do you feel you were responsible for this event or decision?

```
1-----------------2----------------3----------------4--------------5
Not                     Somewhat                    Completely
responsible            responsible                  responsible
```

If you circled **1** please go straight to question **16 (b)** on the next page.
If you circled **2**, **3**, **4** or **5** please state below *why* you feel responsible:

_____

_____

_____

_____

_____

_____

(b) At the time it happened, how justified was the event or decision?

```
1----------------2----------------3----------------4-------------5
Not justified          Somewhat                Completely
                       justified                justified
```

If you circled **1** please go straight to **question 17** on the next page.
If you circled **2**, **3**, **4** or **5** please take your time to explain below *how* you justified your action or inaction to yourself at the time (*i.e., what did you say to yourself?*):

_____

_____

_____

_____

_____

_____

(c) Looking back on it, how strong do you think this justification is now?

```
1----------------2----------------3----------------4-------------5
A weak                  A moderate               A strong
justification           justification            justification
```

(d) There are many reasons that we decide to do something or not do something that we later end up regretting. For instance, we may justify our actions or inactions in the following ways:

• *Personal Beliefs* – we believe it is the right thing to do at the time
• *Situational Factors* – some other reason compels us to do it (e.g., our
                          friends were doing it)

When you think about how you justified your action or inaction, what do you feel your justification was *more* consistent with? Please indicate by circling **one** of the options below:

```
1---------------------2----------------------3---------------------4
Personal          Mainly personal        Mainly            Situational
beliefs           beliefs (but with      situational       factors
                  some situational       factors (but with
                  factors)               some personal
                                         beliefs)
```

Q 17. Some people have personal rules, or life philosophies, that often help guide what they do. For example, some people believe that you should always think of family needs before your own, or some think that the most important thing in life is to be nice to people.

Take a minute to think about what some of your most important personal rules are. What rules help guide your decision-making?

Try to choose what you believe are some of your most important personal rules. Now that you have them in mind, compare them to the decision or event that you regret. Do you feel that the decision you made or event you experienced contradicts *any* of your personal rules? (Please tick only <u>one</u> box):

<div align="center">

☐   ☐

No it does not   Yes it does

</div>

Q 18. Please indicate in the space below how long ago (approximately) this decision or event took place. If you cannot remember the exact date then just indicate roughly how many *years* ago it occurred.

*For example, if the event or decision took place ten and a half years ago, then you would indicate **10** years and **6** months.*

<div align="center">

———————   ———————

MONTHS   **YEARS**

</div>

<div align="center">

This is the end of section 3

</div>

Section 4

All about you

The questions on this page ask a bit more about you. Specifically, we want to know more about how you approach life, how you approach decision situations, and how you see yourself in these situations.

Q 19. The 9 statements below describe how people may feel about themselves and their interactions with others. Please read each statement carefully and show how much you agree or disagree that **the statement reflects how you feel** by circling the appropriate number scale next to it.

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1.	It is important to me that those who know me can predict what I will do……………………	1	2	3	4	5
2.	I want to be described by others as a stable, predictable person……………………………	1	2	3	4	5
3.	The appearance of consistency is an important part of the image I present to the world……...	1	2	3	4	5
4.	An important requirement for any friend of mine is personal consistency…………………	1	2	3	4	5
5.	I typically prefer to do things the same way…	1	2	3	4	5
6.	I want my close friends to be predictable…….	1	2	3	4	5
7.	It is important to me that others view me as a stable person………………………………….	1	2	3	4	5
8.	I make an effort to appear consistent to others.	1	2	3	4	5
9.	It doesn't bother me much if my actions are inconsistent………………………………...	1	2	3	4	5

Section 5

General Background Information

We would like to get some general background information on all of the people that complete the questionnaires. Please answer the following questions:

Q 20. Are you: **Male** ☐ **Female** ☐ (please tick one)

Q 21. What is your age: **I am _____ years old**

Q 22. What ethic group do you mainly identify with: (please tick one)

1.	Maori…………………………………………………...	☐
2.	Pacific Island…………………………………………...	☐
3.	New Zealand European………………………………	☐
4.	European………………………………………………...	☐
5.	New Zealand Asian……………………………………	☐
6.	Asian……………………………………………………	☐
7.	Other……………………………………..…………....	☐

Q 23. What is your highest educational qualification obtained: (please tick one)

1.	No school qualifications……………………………...	☐
2.	School Certificate……………………………………	☐
3.	Sixth Form Certificate……………………….………	☐
4.	Bursary or University Entrance………………………	☐
5.	Trade Certificate or Professional Certificate…………	☐
6.	University Undergraduate Diploma or Degree………	☐
7.	University Post-graduate Diploma or degree………...	☐

Q 24. Which of the following **best** describes your current situation: (please tick one)

I am:

1.	In full-time paid employment…..…………….….…	☐
2.	In part-time paid employment…………………….	☐
3.	Self-employed……………………………………..	☐
4.	A homemaker……...…..………………….…….	☐
5.	A student……………….……...………………………	☐
6.	Retired………………………………..…….……	☐
7.	Partly-retired…………………………….…….…	☐
8.	Unemployed……………………………..………...	☐
9.	Other (please specify below)	☐

_____

This is the end of the questionnaire. **Thank you** for taking the
time to participate in this research.

Life Regrets Research
Request Form for a Summary of Results

This is a request form that you can fill out if you would like to receive a summary of the study's results when they are completed. The completion date is expected to be the summer of 2005/2006.

Note: If you fill out this request form then please ensure that you detach it from the questionnaire and send it in a separate envelope (envelope is provided). This will ensure that your questionnaire is completely anonymous and cannot be linked to your request form.

"I have completed the questionnaire in full and would like to receive a summary of the results when they are available"

(Please print clearly in block letters)

Name: ……………………………………………………………………

Address: ……………………………………………………………………

                   ……………………………………………………………………

                   ……………………………………………………………………

                   ……………………………………………………………………

APPENDIX D.
MENTAL HEALTH ADVISORY NOTE

For your peace of mind

Dear Sir / Madam,

I thank you for sparing the time to complete this questionnaire and helping me with my research. I am aware that the questionnaire you have just completed covers some very personal information. If as a result of answering this questionnaire, or for any other reason, you feel you would like to discuss your feelings in a private and confidential setting, there are a number of services available to the general public.

If you are unsure of how to approach a counsellor or psychologist, then you should see your family doctor who could refer you to one. Your local District Health Board (DHB) can provide your family doctor with a list of services available to the public. ACC accredited psychologists and counsellors are also available through the yellow pages and the ACC website: www.acc.co.nz

The New Zealand Psychological Society advises the general public that if you are seeking a psychologist then you should make sure they are *registered* with a professional body. There is a website that contains a comprehensive listing of counsellors and psychologists throughout New Zealand. This site outlines the areas of specialisation for each counsellor or psychologist, contact details, who they are accredited by, and cost of service. The website is easy to navigate in. For instance, if you wanted to know who to talk to about being so anxious, then type "anxiety' in the search option and a list of anxiety specialists will appear along with their location. The website is located on the following web address: www.gmd.net.nz

If you just feel like a friendly and confidential chat then Samaritans have a 24-hour phone service that you can call on (06) 358 2442 or a free-phone number 0800 726 666.

Once more, I thank you for participating in my research and I wish you all the best for the future.

Yours sincerely,

Andy Towers
School of Psychology
Massey University
Private Bag 11 222
Palmerston North

Ph: (06) 356 9099 (ext. 2046)
Email: A.J.Towers@massey.ac.nz

APPENDIX E.

FOLLOW-UP POSTCARD

(Front of postcard)

<Participant name>

<Address line 1>
<Address line 2>
<Address line 3>
<Address line 4>

(Back of postcard)

Dear <Participant name>

Recently you were contacted regarding participating in research to better understand the development of life regrets and how they impact on our current wellbeing.

I would like to sincerely thank all those who responded to the questionnaire, your input has been brilliant. For those who requested summary feedback at the end of the study, I expect this to be ready in near the end of 2005. If you still have a questionnaire sitting at home and forgot to post it, we would like you to know that we are still keen to receive your responses. If you did not receive a questionnaire, or if it was misplaced, please call me on (06) 356 9099 ext. 2046 or email me at A.J.Towers@massey.ac.nz and I will get another one in the mail to you today.

Thank you

Andy Towers