

Considering Parental Mortality: The Role of Adults' Attachment Style

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Very little research has studied the common challenge in adulthood of coming to terms with the eventual mortality of one's parents as they age and experience illness. The present work begins to explore this emotional adjustment and draws on Attachment Theory and the study of how people cope with their own mortality (Terror Management Theory) to develop hypotheses about potential responses of the adult child. Feelings of vigilance and thoughts or behavioural predispositions toward proximity-seeking, disengagement, and control are considered. I hypothesized specific differences in these responses based on the tendency for those high in attachment anxiety to 'hyperactivate' attachment-related thoughts and for those high in attachment avoidance to 'deactivate' these thoughts.

Study 1 used self-report measures in a community sample of adults for whom a parent had experienced a significant illness. Participants high in either attachment anxiety or attachment avoidance were less likely to seek proximity to ill parents than those low on these attachment dimensions. Those high in attachment avoidance were also less likely to experience feelings of vigilance for signs of illness in their parents and to want to assert control over their parents' health care relative to those who were low in attachment avoidance. These findings were consistent with hypotheses based on attachment avoidance but opposite to hypotheses based on attachment anxiety. Variation in responses to an ill parent was also found depending on the age of participants and their parents, the severity of the parents' illness and their health care behaviours, and whether the adult served as a caregiver for their parent.

Using a word-completion task, Study 2 assessed whether themes of proximity, disengagement, and control were cognitively accessible following imaginal induction of a

parents' mortality, participants' own mortality, or an experience of physical pain. The pattern of results did not support hypothesized differences in reaction times based on dimensions of attachment anxiety and avoidance. Predicted differences based on which induction was completed were also not found. Self-report responses replicated findings from Study 1 such that participants high in attachment anxiety were less likely to want to seek proximity to ill parents when thinking about their mortality than those low in attachment anxiety, and that those high in attachment avoidance were less likely to feel vigilant and to want to seek proximity or to assert control over their parent relative to those who scored low on measures of attachment avoidance.

The manner in which adults respond to being confronted with their parents' mortality has significant implications for their own emotional well-being as well as for the emotional and physical well-being of their parent. Given that adults often become caregivers for their ill and aging parents, this area of study warrants further research.

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Death is one of the most difficult life events for people to come to terms with and one of the most common sources of fear and anxiety (Becker, 1973; Florian & Kravetz, 1983). While a growing literature focuses on the emotional, cognitive, and behavioural responses to considering one's own mortality (Greenberg, Solomon, & Arndt, 2008; Solomon, Greenberg, & Pyszczynski, 2004), there is little basic research considering the responses elicited when anticipating the death of close others, particularly one's parents. A considerable developmental challenge of adulthood is facing a parent's declining health and major illness (Krause & Haverkamp, 1996). It is often with the onset of significant health concerns that adult children begin to consider seriously the mortality of their parents. This development is likely to elicit numerous and potentially conflicting thoughts and emotions which will influence the adult child's behaviour and the nature of interactions with the parent. The changing patterns and roles of the parent-child relationship have implications for the emotional well-being of both the parent and the adult child. These dynamics also have implications for the care and physical well-being of a growing population of older adults requiring care (Cicirelli, 1993; Karantzas, Evans, Foddy, 2010).

The present research serves as an initial exploration of how adult children respond when their parent's mortality becomes salient. To date, there is little research considering the parent-child relationship at this stage of life; however, the continuing importance of the parent-child attachment relationship has been well demonstrated (Cox, Arndt, Pyszczynski, Greenberg, Abdollahi, & Solomon, 2008; Cicirelli, 1993; Karantzas, Evans, Foddy, 2010; Krause & Haverkamp, 1996; Magai, 2008). The present research builds on attachment theory and proposes that adult children's response to considering a parent's mortality will depend on the nature of their attachment relationship with that parent. Previous research has considered the role of attachment in providing care for parents, which becomes increasingly important as parents age

and require greater assistance (Cicirelli, 1993; 2000; Karantzas, Evans, Foddy, 2010; Krause & Haverkamp, 1996; Laditka & Laditka, 2000; Sörensen, Webster, & Roggman, 2002). The present research draws on articles within the caregiving literature, which consider the dynamics of caregiving relationships among spouses and between adults and their older parents. Given that thoughts of a parent's death are apt to make one's own mortality more salient (Martens, Greenberg, Schimel, and Landau, 2004), the field of Terror Management Theory (Greenberg, Solomon, & Pyszczynski, 1997; Pyszczynski, Greenberg, & Solomon, 1997), which considers how people respond to reminders of their own mortality, will also be discussed in the introduction to Study 2, which draws on this theory in its methodological design. Notably, study 2 uses an implicit design in contrast to the explicit methodology used in study 1. This approach allows for a more complete examination of the internal and external experiences of adults during this developmental stage.

My first study used a community sample of adults for whom a parent had experienced a significant health crisis within the past year. These participants reported on their tendencies to become vigilant for signs of illness in their parent, to want greater proximity with their parent, to disengage from their thoughts and emotions about their parent, and to want to protect their parent to the point that it could be experienced as controlling. In a second study, using a cognitive paradigm in the laboratory, I tested whether the implicit accessibility of thoughts related to themes of proximity, control, and disengagement differ depending on inductions of one's own death, the death of one's mother, or an experience of physical pain. In both studies, I examined the role of specific attachments to the target parent for these responses. In the survey study, I also considered several characteristics of the child (e.g., spiritual beliefs, caregiver burden) and of the parent (i.e., illness severity, health-related behaviours).

To provide a context for these studies, I will first provide a review of attachment theory and describe the dimensions that have been found to delineate the quality and security of attachment relationships. Notably, attachment theory was originally developed to understand reactions of infants to separation and loss from their primary caregivers (Bowlby, 1973). It follows that this theory may also serve to understand reactions of adults to the anticipated loss of these attachment figures later in life.

Attachment Theory

According to Bowlby (1969; 1973), the attachment system has evolved in human beings to increase the likelihood of survival for infants who inherently require significant care and protection during their early years. The attachment relationships that develop between infants and caregivers serve to maintain proximity between them and to protect the infant from danger. As such, attachment figures ideally represent a source of security and comfort for the child. As children develop and become less dependent on others, attachment figures can remain a “secure base” from which they can gradually explore the surrounding world and pursue other important goals. However, during times of stress or perceived threat, the attachment system is still likely to become activated, prompting the child to seek proximity to safety- and security-providing attachment figures (Bowlby, 1969; 1973).

While attachment theory originally focused on infants, a widespread field of research has considered the role of attachment in adult development (e.g., Cicirelli, 1983; 1991; 1993; Magai, 2008; Main, Kaplan, & Cassidy, 1985; Simpson & Rholes, 1998). Research beginning with Hazan and Shaver (1987), has extended the theory to understand the nature of attachment relationships developed later in life, such as romantic relationships. Further research has

emphasized the continued importance of the parent-child attachment relationship in adulthood (Doka, 1996; Krause & Havenkamp, 1996; Magai, 2008) and has suggested that adults continue to demonstrate a need for closeness, protection, and emotional support. Particularly during times of distress, the attachment system continues to become activated such that proximity is sought to close others to obtain comfort and alleviate distress (Magai, 2008; Mikulincer & Florian, 1998). As such, close relationship partners continue to serve an emotion-regulation function by buffering the impact of negative emotions. Notably, however, the extent to which people are comforted by closeness to relational partners depends on how secure they feel within that relationship and within relationships in general.

Attachment Style

According to attachment theory, comfort and security in relationships with parents depends on the extent to which these attachment figures are warm, consistent, and responsive to signals of distress early in life (Bowlby, 1973; Ainsworth, Blehar, Waters, & Wall, 1978). These early experiences lay a foundation for people's views about their parents (and others in general) as well as their views of themselves. Specifically, they develop expectations about whether others are likely to be available for comfort and security during times of need and beliefs about whether they themselves, are competent, loved, and valued (Bowlby, 1973).

Positive interactions with responsive and supportive attachment figures foster a sense of security in relationships with optimistic expectations about the availability of others and positive beliefs about the self as competent, valued, and lovable. Because they have consistently found that others are supportive and help to alleviate distress during times of need, those high in attachment security have confidence in proximity and support seeking as effective ways to

regulate distress (Mikulincer & Florian, 1995; 1998; Shaver & Mikulincer, 2002). Attachment security also appears to provide an “inner resource” for coping with stressful events. Those high in security have learned that they are capable of managing distress and overcoming obstacles and that they have some control over the course of their distress by using problem-focused coping in addition to support seeking (Mikulincer & Florian, 1998; Shaver & Mikulincer, 2002)

Attachment theorists have conceptualized and measured attachment insecurity both in categorical and dimensional terms (e.g., Bartholomew & Horowitz, 1991; Collins & Read, 1990; Hazan & Shaver, 1987). Whereas the categorical approach identifies discrete categories of attachment styles, dimensional scores allow an individual’s degree of insecurity to lie along any point of a continuous scale. A review and factor analysis of the wide range of self-report measurements that have been created to assess attachment in adults suggests that differences in people’s tendencies to be anxious or avoidant in their relationships are key factors in attachment. These two styles of attachment insecurity were found to vary continuously and independently (Brennan, Clark, & Shaver, 1998). As such, the present research uses a dimensional approach to attachment insecurity, but draws on research using diverse measurements and conceptualizations.

The dimension of attachment anxiety corresponds to the extent to which people view themselves as worthy of love and care. Those who are high in attachment anxiety have more negative views about themselves than those low in attachment anxiety (Bartholomew & Horowitz, 1991; Collins & Read, 1990). While they have a strong desire to be close to others, their negative beliefs about themselves tend to exaggerate the likelihood and severity of rejection. As such, those high in attachment anxiety often demonstrate a preoccupation with relationships, a desire for complete union with others, and a need for frequent reassurances of

love (Hazan & Shaver, 1987). In essence, they demonstrate a ‘hyperactivation’ of the attachment system (Mikulincer, Gillath, & Shaver, 2002; Shaver & Mikulincer, 2002). In response to distress, those high in attachment anxiety often direct their attention toward the source of distress in a vigilant manner and make use of passive, ruminative, and emotion-focused coping strategies (Mikulincer & Florian, 1995; 1998).

Attachment avoidance corresponds to people’s views of others and captures the extent to which they believe that others will be able and willing to provide support and comfort in times of need (Bartholomew & Horowitz, 1991). Those who are high in attachment avoidance see others as less reliable and less responsive than do those low in attachment avoidance. From previous experiences, they may expect that expressions of distress will lead to rejection or rebuff from others (Cassidy & Kobak, 1988). As such, they strive defensively to avoid emotional closeness and intimacy and tend not to acknowledge any overt distress to others (Cassidy & Kobak, 1988; Mikulincer & Florian, 1998). It remains unclear, however, to what extent those high in attachment avoidance have been successful in “deactivating” the attachment system and whether they do experience emotional distress in response to separation and loss (Fraley, Davis, & Shaver, 1998; Mikulincer & Florian, 1998; Shaver & Mikulincer, 2002). Given the defensive nature of attachment avoidance and the potential for misrepresentation using self-report instruments, it may be necessary to use indirect methods to gain a better understanding of the internal experiences of these individuals. Recent studies using indirect methods to assess these questions will be reviewed in the introduction to Study 2, which uses an implicit method to understand more fully the effects of a parent’s mortality becoming salient.

While attachment style has traditionally been conceptualized as a global, between-person construct that remains stable across the lifespan (Bowlby, 1973), research extending this theory into adulthood has found that the extent to which other relational partners are responsive and supportive continues to influence people's views about themselves and others (Hazan & Shaver, 1987; La Guardia, Ryan, Couchman, & Deci, 2000). Indeed, research by La Guardia and colleagues (2000) has found significant within-person variability in attachment security across people's close relationships. The extent to which people feel secure within specific relationships will depend not only on their early attachment experiences, but also on the extent to which their partner in that specific relationship is responsive and supportive of their needs. When considering the mortality of an attachment figure, it is likely that one's sense of security in that particular relationship will be more relevant than their general attachment style. As such, the attachment between the adult child and his or her parent is used in the current research.

By the time children reach adulthood, they have experienced a long history with their parents that will influence their interactions and may shift the quality of the attachment relationship. Indeed, research in the attachment field suggests that attachment style in adulthood is only moderately correlated with attachment style during infancy (e.g., Fraley & Brumbaugh, 2004; Davila & Cobb, 2004). With increases in longevity due to advances in medicine, the majority of parents and children will experience 50 years of their lives together, and most children will have at least one living parent for most of their adult years (Barnett, Kibria, Baruch, & Pleck, 1991; Krause & Haverkamp, 1996). Research suggests that parents continue to provide a secure base as well as emotional and instrumental support throughout the lifespan (Levitt, 1991; Spitze & Logan, 1992). However, as children enter and pass through adulthood, they begin to provide more care to their parents in return (Laditka & Laditka, 2000; Magai,

2008). In essence, the relationship between adult children and their older parents becomes one of mutual aid with increasing care for parents with age and greater illness severity (Myers, 1988). This transition and the increased salience of the parent's mortality are likely to elicit some degree of distress for the adult child and the quality of the attachment relationship is likely to play a role in how this distress emerges (Magai, 2008). At a time when the parent requires increasing levels of assistance, the manner in which the adult child responds to the threat of losing the attachment bond is likely to influence the amount and quality of care that older parents receive.

Caring for Ill and/or Aging Parents

Research in the caregiving literature suggests that the quality of the attachment relationship plays a role in adults' preparation for and engagement in caregiving (Cicirelli, 1993; Karantzas, Evans, Foddy, 2010; Krause & Haverkamp, 1996; Sörensen, Webster, & Roggman, 2002). According to Cicirelli (1983; 1991; 1993), one source of motivation to care for parents is to preserve the attachment bond by protecting and delaying the death of the parent for as long as possible. Across two studies using path analyses, stronger feelings of attachment toward parents was related to helping behaviours (Cicirelli, 1983; 1993). Stronger feelings of attachment were also related to a stronger commitment to provide future help (Cicirelli, 1983) and to less subjective burden from providing care (Cicirelli, 1993). Notably, Cicirelli's studies do not examine attachment styles or dimensions of security/insecurity; rather, attachment is assessed in terms of feelings of closeness.

Research by Sörensen and colleagues (2002) found that individuals with greater attachment security felt more prepared to take on the role of caring for a parent than those lower in attachment security. Both those high in attachment anxiety and those high in attachment

avoidance reported feeling less prepared for this responsibility. These researchers reasoned that those high in attachment anxiety would be focused on emotional coping rather than problem solving in order to prepare whereas those high in attachment avoidance would simply avoid thinking about the topic altogether (Sörensen, Webster, & Roggman, 2002). Indeed, research suggests that those who are avoidant in their attachment relationships are less likely to provide care for their parents (Karantzas, Evans, & Foddy, 2010; Markiewicz, Reis, & Gold, 1997) or romantic partners (Collins & Feeney, 2000; Feeney & Hohaus, 2001). Specifically, Markiewicz, Reis, and Gold (1997) found that adults who chose to place their parents into care facilities reported higher levels of attachment avoidance than those who chose to care for their parents in the community. Similarly, attachment avoidance was related to less willingness to provide future care for parents in a sample of current caregivers (Karantzas, Evans, & Foddy, 2010).

The role of the attachment relationship may vary depending on the nature of caregiving activities. Carpenter (2001) found that securely attached daughters provided more emotional care for their elderly mothers than insecurely attached daughters; however, attachment was unrelated to the provision of instrumental care. He proposed that providing emotional support to an aging mother may be too great of a “psychological risk” for those who do not feel secure in their relationship with her, whereas instrumental care can be provided with little emotional involvement (Carpenter, 2001). Indeed, it is likely that the quality of the attachment relationship will influence the type of caregiving activities that adult children feel comfortable providing to their older parents as well as the manner in which these activities are engaged in. The quality of the attachment relationship is also likely to influence the adult child’s response to the threat of losing the attachment bond, which becomes more salient as parents becomes less able to care for themselves. This, in turn, will further influence the nature of care provided.

The present research considers the responses of adult children to an increased salience of a parent's mortality. Based on the above literature, I proposed specific cognitive, emotional, and behavioural responses, which are likely to be influenced by the quality of the adult child's relationship with the parent whose mortality has become salient. Not only will these responses influence the nature of care that is provided and, therefore, the physical well-being of the parent, they will also have implications for the emotional well-being of both the parent and the adult child. These implications will be considered further following a discussion of the potential responses of the adult child.

Response to a Parent's Mortality

From an evolutionary perspective, it is adaptive to direct one's attention to potential sources of threat with the goal of assessing when and how to respond (Mogg & Bradley, 1998; Oatley & Johnson-Laird, 1987). Individuals high in anxiety in general, and attachment anxiety in particular, have a tendency to perceive things as more threatening and to become highly attuned or even vigilant for signs of threat (Mikulincer & Florian, 1998; Mogg & Bradley, 1998). Separation from an attachment figure represents a significant threat and one of the greatest potential sources of distress for those high in attachment anxiety. As such, the threat of a parent's mortality may prompt a sense of vigilance toward the parent and monitoring for any signs that he or she may be at risk. Indeed, research in the caregiving literature has found that spouses who provide care to their partner following the partner's cardiac surgery report tendencies to monitor and be vigilant toward their partner's health cues (Knoll & Johnson, 2000; Theobald & McMurray, 2004). These tendencies are likely to be stronger among those who are anxious in their attachment relationship with the parent whose mortality has been made salient.

Given the emotion-regulating function of the attachment system and the tendency to seek a “secure base” in response to threat, it follows that reminders of a parent’s mortality may prompt greater desires for proximity to the attachment figure. However, when a parent’s mortality is made salient due to significant illness or injury, greater proximity to the parent is likely to trigger more reminders of their mortality. In essence, the parent may now represent a source of anxiety and fear from which one might be inclined to withdraw. To avoid reminders of their parents’ mortality, adult children may try to disengage from their thoughts and feelings about their parents and may even actively avoid having contact with them. Disengaging from a parent is likely to be more common among those who are already avoidant in their relationship with the parent. Those high in attachment avoidance often do not acknowledge emotional distress. During potential times of distress, they tend to emphasize their own self-reliance and to increase distance from others rather than seeking closeness (Mikulincer & Florian, 1998).

In attempts to reduce their fear and anxiety, adult children may strive to protect their parents from potential harm or threats to their health. While efforts to protect a parent are likely to be helpful and well-intended, the anxiety experienced by the adult child may prompt them to go beyond the needs of the parent and thus to be experienced as overprotective and controlling by the parent. Returning to the caregiving literature, spouses have been found to assert control of their ill partner’s health-related behaviours such as smoking, drinking alcohol, exercising, losing weight, eating healthier foods, seeing a doctor regularly, getting enough sleep, and proper use of medications (Tucker & Anders, 2001). Indeed, one study, involving couples in which the husband was recently treated for heart disease, found that 93% of wives reported exerting some form of control over their husband at least once or twice in the past month while 100% of

husbands reported receiving control from their wives in the same period (Franks, Wendorf, Gonzalez, & Ketterer, 2004).

Further research has noted controlling behaviours of adult children toward parents for whom they serve as caregivers (Cicirelli, 2000). These behaviours were found to vary depending on a number of characteristics of the parent and his or her illness. Specifically, adult children were more likely to urge their parents to behave in a more treatment-compliant manner (e.g., reminders to take medication, urging the parent to change bad health habits) when they perceived their parent to have more numerous, persistent, and severe symptoms, greater depressive tendencies and memory problems, and when they perceived their parent to be less mobile, less capable of managing daily activities, and less capable of problem solving. Adult children were more likely to take direct actions, such as preparing or arranging special food diets and discussing their parent's health with medical staff, when they viewed their parents as being less mobile, less able to engage in daily activities, and less able to solve everyday problems (Cicirelli, 2000). Given their tendency to view things as more threatening and to become vigilant for sources of threat, it is likely that those high in attachment anxiety will be more likely to assert control over their parents' health care in attempts to cope with their anxiety.

Thus, being confronted with a parent's mortality has the potential to increase positive approach behaviours (i.e., proximity seeking) and negative approach behaviours (i.e., asserting control) as well as avoidance behaviours (i.e., disengagement). A feeling of vigilance and thoughts of proximity or control may underlie the approach behaviours. Avoidance behaviours are likely to be linked with a disengagement from thoughts and emotions; however, these thoughts may still be present at a non-conscious level. Because the parent and child generally

have a rich relational history before the threat of a parent's mortality becomes salient, these responses to considering a parent's mortality will likely be qualified by the quality of the prior relationship between parent and child.

Specifically, I predict that those who generally experience greater anxiety in their relationship with a parent will report stronger tendencies to become vigilant, to seek proximity, and to assert control over their parent's health care when he or she becomes ill and to report lower tendencies to want to disengage from him or her. For those who are generally more avoidant in their relationship with a parent, I expect stronger tendencies toward disengagement and lower experiences of vigilance, desires for proximity, and tendencies to assert control over their parent when he or she becomes ill. The manner in which these responses manifest behaviourally within the parent-child relationship will have significant implications for the well-being of both the parent and the adult child.

Implications for the Parent's Well-being

For the parent, having an adult child assert control may undermine their need for autonomy (i.e., choice and volition) in their own care. Autonomy support from caregivers, in the form of acknowledging the patient's perspective, providing choices, sharing important information, and minimizing control, has been shown to promote autonomous motivation toward positive health behaviour changes (Williams et al., 2006a; Williams et al., 2006b) as well as greater physical and emotional well-being (Williams, 2002). Reducing a parent's control of their own care, and thus undermining their autonomy, also has the potential to undermine their sense of competence (Ryan, Patrick, Deci, & Williams, 2008). In order for people to perceive themselves as competent, they must feel that they have control over important outcomes such as

their health care (Williams, MacGregor, Zeldman, Freedman, & Deci, 2004). When people perceive themselves to be incompetent, or unable to control their own outcomes, they are unlikely to feel motivated to take on these activities and may ultimately give up on efforts to care for themselves (Williams et al., 2004).

Disengagement on the part of the child can also have negative implications for the health and well-being of the parent. Most notably, when an adult child physically withdraws from a parent, this act may prevent the parent from receiving necessary instrumental support and their health needs may be unmet. Moreover, both physical and emotional disengagement prevent parents from receiving emotional support and a sense of connection as they confront their own mortality. In the field of Terror Management Theory which will be discussed further in Study 2, a sense of connection and proximity to loved ones helps to buffer the anxiety associated with one's own mortality (Mikulincer, Florian, & Hirschberger, 2003) and the inability to obtain this may heighten the parent's anxiety.

Implications for the Adult Child

For adult children, vigilant concern for the parent's health and safety or excessive involvement in their parent's care may limit their own ability to fulfill other responsibilities or may lead to burnout and potential resentment of the parent. A large field of literature on caregiving burden has identified several factors that lead to greater burden and is exploring treatment/methods for helping to relieve some of the burden placed on caregivers (Funk, Stajduhar, Toye, Aoun, Grande, & Todd, 2010; Stajduhar, Funk, Toye, Grande, Aoun, & Todd, 2010). Indeed, the quality of the attachment relationship again appears to be a factor that plays a role in this experience. Research by Carpenter (2001) discussed previously also found that

daughters who were more securely attached to their mothers reported less caregiver burden from taking on this role. Similarly, Crispi, Schiaffino, and Berman (1997) found that caregivers who were classified as securely attached reported lower levels of caregiving difficulty and fewer psychological symptoms than those who were insecurely attached. Preoccupation with the attachment relationship also predicted greater psychological symptoms but was unrelated to caregiving difficulty (Crispi, Shiaffino, & Berman, 1997).

While feelings of vigilance may adversely affect the adult child, disengaging from an ill or aging parent may also have implications for the adult child's well-being. By not acknowledging or processing thoughts and feelings about the parent's mortality, we might speculate that the adult child is less likely to process and come to terms with their parent's eventual death. Actively avoiding the parent may also prevent the adult child from spending what time is left with their parent and from having the opportunity to say goodbye. A reasonable speculation would be that this could lead to feelings of confusion or a sense of regret when the parent eventually dies.

Although there does not appear to be any published research linking people's behaviours prior to the death of loved ones to their ability to cope with bereavement, Stroebe and Schut's (1999; 2005) dual-process model of coping suggests that reorganization of attachment working models following bereavement requires both hyperactivating and deactivating strategies. Hyperactivating strategies serve to reactivate memories of the loved one along with the recognition that he or she is no longer present; deactivating strategies allow moments of detachment in order to manage continuing daily life activities and to explore the continued meaning of the lost relationship (Stroebe & Schut, 1999; 2005). Research suggests that the

quality of the attachment relationship may again play a role in how the adult child navigates this process and their subsequent well-being after the parent has passed away (Field & Sundin, 2001; Parkes, 2003; Shaver & Tancredy, 2001; Stroebe, Schut, & Stroebe, 2005; Wayment & Vierthaler, 2002).

Although a detailed discussion of bereavement and the factors which influence the duration, intensity, and expression of grief is beyond the scope of the current research, attachment theory logically extends to this process and several studies support the hypothesis that attachment style plays a role in grief and bereavement (Field & Sundin, 2001; Parkes, 2003; Wayment & Vierthaler, 2002). According to attachment theorists (Shaver and Tancredy, 2001), securely attached individuals will react emotionally to the loss of an important relationship partner but will not be overwhelmed by grief given that they are able to access and coherently discuss their attachment-related memories. Those high in attachment avoidance but low in attachment anxiety (i.e., dismissing) are less likely to demonstrate strong emotions following a loss and may, indeed, have previously limited the extent to which they depended on the lost relational partner. Conversely, those high in attachment anxiety but low in attachment avoidance (i.e., preoccupied), who are generally more likely to have strong emotions and be preoccupied with relationships, are expected to demonstrate a more intense and prolonged grief response. Finally, those high in both attachment anxiety and attachment avoidance (i.e., fearful or disorganized) are expected to cope poorly with loss and to struggle to discuss their loss coherently (Shaver & Tancredy, 2001).

A retrospective study by Field and Sundin (2001) found that individuals with an anxious attachment style whose spouse had passed away reported an appraised inability to cope with their

loss and high levels of psychological symptoms over a 5-year period. The attachment avoidance measure, however, was not associated with outcomes of coping and bereavement. Similarly, Wayment and Vierthaler (2002) found that individuals with an avoidant attachment style did not report greater levels of grief or depression but did report greater somatization following the loss of a spouse, family member, or close friend. Anxious attachment was associated with greater levels of grief and depression and securely attached individuals reported lower levels of depression than insecure individuals (Wayment & Vierthaler, 2002). Finally, an unpublished manuscript by Parkes (2003) found that anxious attachment was correlated with protracted grief and avoidant attachment was correlated with continued difficulties in expressing affection as well as grief. A disorganized attachment style was associated with high levels of anxiety/panic, depression, and alcohol consumption (Parkes, 2003 as cited in Stroebe, Schut, & Stroebe, 2005, p. 60).

In sum, attachment behaviour appears to “characterize human beings from the cradle to the grave” as initially suggested by Bowlby (1979, p. 129). As proposed in the present research, attachment style is likely to play a significant role in how adult children confront their parents’ mortality. This, in turn, will influence the dynamics of the parent-child relationship at this stage of life and the nature of care provided to older parents by their adult offspring. This process will have significant implications for the well-being of both the parent and the adult child. Given these potential implications, the adult child’s ability to navigate this mortality threat effectively and to care for the parent, without damaging the integrity of their own or the parents’ well-being, becomes centrally important.

Study 1

The purpose of Study 1 was to explicitly assess how thinking about a parent's health and mortality, when a parent experiences a significant health problem, relates to one's behavioural orientation toward that parent. In this study, I recruited a community sample of adults for whom a parent had experienced a significant illness in the past year and was still living. Participants completed an online survey measuring a number of personal variables as well as dimensions of insecurity. Participants rated the extent to which thoughts of their parent's mortality made them feel vigilant for signs of illness in their parent. They also rated perceptions of their motivations to seek greater proximity to, disengage from or assert control over their parent in attempts to protect him or her from possible harm (i.e., actual behavioural responses were not assessed). These potential responses to considering a parent's mortality were chosen as a reasonable starting point in this new line of study given evidence of their occurrence from the caregiving literature (Cicirelli, 2000; Franks, Wendorf, Gonzalez, & Ketterer, 2004; Tucker & Anders, 2001).

I hypothesized that greater attachment anxiety would be associated with greater vigilance concerning the health-status and health-related behavior of the parent (hereafter simply referred to as "vigilance"), a greater desire for proximity to the parent (hereafter called "proximity"), less disengagement from the parent (hereafter called "disengagement"), and a stronger desire to assert control over the parent's care (hereafter called "control"). Further, I predicted that greater attachment avoidance would be associated with less vigilance, a lower desire for proximity, more disengagement, and less desire to assert control. I also predicted specific interrelationships between feelings of vigilance and the desire to seek proximity and to assert control. Vigilance can manifest as a positive, responsive behaviour within relationships, particularly when

warranted by a serious illness, but it can also be a precursor to controlling behaviour toward the parent. As such, I expected that participants who reported feeling more vigilant would also report both greater proximity seeking and more controlling behaviours.

Finally, I assessed other potential influences on the adult child's tendency to become vigilant for signs of illness in their parents and their desires to seek proximity to, to disengage from, or to assert control over an ill parent. In particular, participants reported on their parent's current health status and health-related behaviours such as diet, exercise, smoking, alcohol consumption, and regularity of doctor's visits. They also indicated whether they currently served a caregiver role for either of their parents and the extent to which this consumed their emotional and physical energy. Participants also completed a questionnaire assessing their own spiritual beliefs, including their beliefs about life after death, which may play a role in how they approach thoughts of death in general.

A parent's current health status is likely to affect directly the extent to which thoughts of mortality are triggered for the child. When a parent's health is very poor and the threat of mortality is most salient, the child's emotional reaction is likely to be stronger and more likely to elicit behavioural responses. As such, I hypothesized that greater reported severity of the parent's illness would be associated with stronger feelings of vigilance and tendencies toward proximity seeking, disengagement, and control. Indeed, research by Cicirelli (2000), mentioned previously, found that adults who perceived their parents to have more numerous, persistent, and severe symptoms were more likely to report controlling behaviours toward their parents.

A parent's health-related behaviours not only have a direct effect on their health status, but may also indicate to the child whether the parent is able to care adequately for his or her own

health. Children who feel that their parent is not capable of caring for himself or herself may be more vigilant for signs of illness that require assistance and may take on these responsibilities, potentially becoming more controlling. Indeed, Tucker and Anders (2001) found that spouses with an ill partner tend to assert control around their partner's health-related behaviours including wanting their spouses to exercise more often, to eat healthier foods, see the doctor regularly, get adequate sleep, lose weight, smoke less, and drink less alcohol. As such, I hypothesized that adult children who rate their parent's health-related behaviours more poorly would report stronger feelings of vigilance and stronger tendencies to assert control over their parents' health care.

The extent to which one is actively engaged in providing care for parents is likely to influence one's emotions and sense of responsibility for the well-being of their parents such that those who serve as caregivers are likely to demonstrate greater vigilance, proximity seeking, and controlling behaviours, and less disengagement (Funk, Stajduhar, Toye, Aoun, Grande, & Todd, 2010; Stajduhar, Funk, Toye, Grande, Aoun, & Todd, 2010). Finally, spiritual beliefs are likely to play a role in how one approaches the idea of mortality in general. That is, people vary considerably in their beliefs about the meaning of death, whether there is any form of continued existence after death, and whether some sense of contact with the living remains, all of which are likely to influence emotions related to one's own mortality and the mortality of loved ones. For example, maintaining a belief in life after death such that there continues to be a connection with lost loved ones may buffer the distress of their mortality. In that case, less distress may be associated with lower tendencies to be vigilant, seek proximity, disengage, and assert control.

Method

Participants and Procedure

Participants were recruited from the community through posters, advertisements on free local classified websites (i.e., www.kijiji.com, www.craigslist.com), and emails sent to graduate students at the University of Waterloo. Participants contacted the researcher via email to obtain login and password information to an online site where the survey was completed. Participants were reimbursed with a free movie pass for their participation.

A total of 117 participants were recruited. Data from seven participants were excluded because their parent was identified as having a significant mental health concern (e.g., alcoholism, depression) rather than a physical illness, or the parent had a relatively non-significant physical concern (e.g., tennis elbow). This resulted in a final sample of 110 (82 women, 28 men) ranging in age from 22 to 64 with a mean age of 39.73 years ($SD = 10.13$ years). The majority of participants identified themselves as White ($N = 76, 69.7\%$) with the remaining identifying as Asian ($N = 18, 16.3\%$), East Indian ($N = 3, 2.7\%$), Hispanic ($N = 3, 2.7\%$), Aboriginal/Native ($N = 1, .9\%$), Black/African ($N = 1, .9\%$), Middle Eastern ($N = 1, .9\%$), or another ethnicity ($N = 7, 6.4\%$).

Measures

Parental Mortality Salience. This scale was created for the purpose of this study to assess participants' responses to thinking about harm leading to the death of a parent. Items tapped the extent to which participants feel vigilant for signs of a parent's illness, seek proximity to their parent, disengage from their thoughts and feelings about their parent's illness, and assert

control over their parents' health care. Participants were asked to rate the extent to which they experienced these emotions and behavioural orientations, specifically in relation to their ill parent, using Likert-type scaling, ranging from "Not at all true" (1) to "Very true" (7). Sample items include "When I think of possible harm coming to my father/mother such that he/she could die... "I am on alert" (vigilance), "It makes me want to be more affectionate with him/her" (proximity seeking), "It is painful and makes me want to avoid thinking about him/her at all" (disengagement), and "It makes me want to limit him/her from doing anything that might make him/her more vulnerable to harm" (control). Scores for each dimension were calculated by averaging the ratings for the items, with higher scores indicating greater vigilance, stronger desire for proximity, greater disengagement, and stronger tendencies to assert control over the parent.

An original twenty items were entered into a principle axis factor analysis with varimax rotation. The four predicted factors emerged as expected; however, four items (one control, three vigilant) were found to have poor factor loadings on their respective factors. Reliability analysis also found these items to reduce reliability of the subscales. As such, these items were eliminated from the final scales resulting in a total of 16 items. All scales demonstrated adequate internal consistency [Vigilance (6 items: $\alpha = .92$); Proximity seeking (3 items: $\alpha = .90$); Disengagement (4 items: $\alpha = .81$); Control (3 items: $\alpha = .85$).]

Adult Attachment. The Relationship Questionnaire (Bartholomew & Horowitz, 1991) consists of four short paragraphs which describe prototypical patterns of Secure, Fearful, Preoccupied, and Dismissive attachment to others. Participants were asked to rate how well each attachment style pertained to their relationships in general, and how well each style applied to

how they were with their ill parent. Ratings were made using Likert type scaling, ranging from “Not at all like me” (1) to “Very much like me” (7). For the purpose of the present study, only the ratings in relation to the ill parent were analyzed. Scores were combined to derive dimensional ratings of attachment anxiety [(fearful + preoccupied) – (secure + dismissing)] and avoidance [(fearful + dismissing) - (secure + preoccupied)]. The attachment anxiety dimension differentiates a tendency to be overly anxious about abandonment by the parent from having a sense of comfort and security in the relationship; the avoidance dimension distinguishes between a tendency to avoid the parent or to be comfortable with closeness to him or her (Bartholomew, 1990; Brennan, Clark, & Shaver, 1998). The anxiety dimension can also be conceptualized as a model of the self corresponding to how positively one sees oneself in relationships, whereas the avoidance dimension is conceptualized as a model of others corresponding to how positively one views others in relationships (Bartholomew & Horowitz, 1991). The RQ is a widely used measure (i.e., cited by 2153 papers on PsycINFO) and has been used to evaluate the constructs of model of self and model of others across a number of countries (Schmitt et al., 2004).

Bartholomew and Horowitz (1991) found this measure to have good construct validity using the Inventory of Interpersonal Problems (IIP) circumplex (Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988). Participants who identified with the secure pattern of attachment tended to report high levels of warmth but did not demonstrate any extreme scores on the IIP. Those who identified most with the dismissing pattern reported a lack of warmth on the IIP, whereas those who identified most with the preoccupied pattern tended to be overly expressive, warm, and somewhat intrusive. Those who identified most with the fearful pattern reported having poor agency, social insecurity, passivity, and lack of assertiveness (Bartholomew & Horowitz, 1991). Further, Griffin and Bartholomew (1994) found that a more negative model of self (i.e., high

attachment anxiety) was significantly correlated with neuroticism, while a more negative model of others (i.e., high attachment avoidance) was significantly correlated with extraversion. Given that the RQ uses only one item to assess each pattern, its internal consistency can not be assessed.

Spiritual and Religious Beliefs. The self-report version of the Royal Free Interview for spiritual and religious beliefs (King, Speck, & Thomas, 1995; 2001) was adapted to assess religious beliefs as well as spiritual beliefs independent of organized religion. First, participants were asked to indicate whether they were spiritual/religious or not. The 81 participants who indicated that they were completed an additional seven items. One of these items asked them to indicate whether they were spiritual, religious, or both spiritual & religious. The remaining six items asked about the strength and importance of practicing their particular beliefs as well as the extent to which they believed in a spiritual force or power outside of themselves that could influence their lives. Sample items include “How important to you is the practice of your belief in your day-to-day life?”, “Do you believe in a spiritual power or force other than yourself that enables you to *cope* personally with events in your life?”, and “To what extent do you believe we exist in some form after our death?” The mean of these scaled items was calculated to create an index of spirituality in which higher scores indicate stronger spiritual beliefs. The 29 participants who initially indicated that they were not spiritual or religious bypassed these items. Studies have demonstrated satisfactory reliability and validity according to accepted psychometric standards for the self-report version of the scale (King, Speck, & Thomas, 2001). The adapted scale used in this study also demonstrated adequate internal consistency (6-items: $\alpha = .86$).

Parental Health. Eight items were used to assess parents' current illnesses and overall health. Health status was assessed by asking participant's to rate the severity of their parent's illness using Likert-type scaling, ranging from "Minimal impact" (1) to "Terminal illness" (5) and to indicate whether the parent had any additional major or minor illnesses. The remaining 6 items, measuring the parent's health-related behaviour, asked participants to rate how well the parent cares for his/her overall health generally, as well as the extent to which the ill parent smokes, consumes alcohol, exercises, has a healthy diet, and visits the doctor. These ratings also used 5-point Likert-type scaling with various anchors depending on the behaviour. Negative health-related behaviours (i.e., smoking, alcohol consumption) were reverse coded so that higher scores on all items reflected healthier behaviours. Next, the mean of these ratings was calculated for each participant to reflect the parent's overall health-related behaviours with higher scores reflecting more positive health-related behaviours and lower scores reflecting more negative health-related behaviours. The compiled health behaviour scale demonstrated adequate internal consistency (6 items; $\alpha = .65$).

Caregiving role. Participants were asked whether they currently filled a caregiving role for either of their parents. 80 participants indicated that they did not. The 30 participants who indicated that they did currently fill a caregiver role were asked to rate the extent to which their caretaking duties used up their physical and emotional energy. These ratings were made on Likert-type scales, ranging from "Not at all" (1) to "A lot" (7). A composite scale of overall caregiver burden was calculated by finding the mean of the ratings for physical and emotional energy use.

Results

Demographic and Individual Differences Analyses

Fifty-nine participants reported on their experience with an ill mother (53.6%) and fifty-one reported on an ill father (46.4%). Parents ranged in age between 40 and 95 with a mean age of 68.71 years ($SD = 10.83$). Participants endorsed the full range of illness severity (i.e., minimal impact to terminal illness) with a mean severity rating of 3.19 on a 5-point scale ($SD = 1.01$). A variety of illnesses were represented with the most common being cardiovascular disease ($N = 29, 26.4\%$), cancer ($N = 25, 22.7\%$), and neurodegenerative diseases (e.g., Alzheimer's, dementia, Parkinson's; $N = 16, 14.5\%$). Means and standard deviations of the study variables are shown in Table 1.

T-tests were conducted in order to examine whether there were any differences in the extent to which participants felt vigilant for signs of illness in their parents, desired greater proximity to, disengagement from, or control of their ill parent depending on participant sex, parent sex, and whether participants considered themselves to be spiritual/ religious or not. In no case were differences observed between groups on these target variables. I also conducted t-tests to assess differences in these variables depending on whether participants currently served as caregivers for their parents. These analyses revealed a significant difference such that participants who served in the role of a caregiver for a parent reported more disengagement than those who did not act as caregivers ($t(108) = 2.30, p < .05, \underline{M} = 3.49$ vs. 2.81).

Next, I used Pearson correlations to understand whether the parent's age, the severity of their illness, or their health-related behaviours were related to the extent to which participants felt vigilant for signs of illness in their parents, desired greater proximity to, disengagement

from, or control of their ill parent. A few significant correlations emerged (Table 2). First, the older the parent, the less disengaged participants were with them ($r = -.24, p < .05$). Participants who rated their parent's illness as more severe also reported stronger desire to assert control over their ill parent ($r = .24, p < .05$). Further, those who reported poorer health-related behaviours on the part of their ill parent reported that they were more likely to feel vigilant ($r = -.23, p < .05$) and to want to assert control over their parent ($r = -.27, p < .01$). Given these significant associations, the severity of a parent's illness and the quality of their health-related behaviours were included as controls in later regression analyses.

Finally, I used Pearson correlations to understand whether the participant's age, the strength of their spiritual beliefs, and the extent to which they experienced caregiver burden were related to the extent to which they felt vigilant for signs of illness in their parents, desired greater proximity to, disengagement from, or control of their ill parent (Table 2). Notably, the strength of spiritual beliefs and caregiver burden scales were only completed by participants who responded to screener questions indicating that they did have spiritual or religious beliefs ($N = 81$) or served as a caregiver for their parent ($N = 29$). Given the smaller sample sizes in analyses involving these two scales and the consequential reduction in power, a magnitude of correlation ($r = .20$) found to be statistically significant in analyses using the full sample ($N = 110$) was used as a cutoff for interpreting meaningfulness in these analyses. Older participants reported being less disengaged from their parents ($r = -.19, p < .05$). Among participants who served as caregivers for their parent, those who reported experiencing greater caregiver burden reported greater vigilance for signs of illness in their parent ($r = .40, p < .05$). Those who reported greater caregiver burden also reported stronger desires to seek proximity to their parents ($r = .26, n.s.$) and greater disengage from their parents ($r = .23, n.s.$). Given that caregivers represented only a

small portion of the total sample, caregiver burden was not included as a control in further analyses. Finally, no significant correlations were found with participant's strength of spiritual beliefs and, as such, this variable was not controlled for in future analyses.

Intercorrelations Among Parental Mortality Saliency Scales

In order to examine the intercorrelations among the dependent variables assessed with the Parental Mortality Saliency scale, I calculated Pearson correlations between measures of vigilance, proximity seeking, disengagement, and control. As predicted, vigilance was significantly positively correlated with both proximity-seeking ($r = .48, p < .001$) and control ($r = .62, p < .001$), such that those who were more vigilant also were more likely to seek proximity to and assert control over their ill parent. Proximity seeking was also positively correlated with control, such that those who sought more proximity to their ill parent also were more likely to assert control over their ill parent ($r = .40, p < .001$). The extent to which participants disengage from their ill parent had a small positive correlation with vigilance ($r = .22, p < .05$) but was not significantly related to proximity seeking ($r = .05, n.s.$) or control ($r = .06, n.s.$).

Attachment Analyses

First, I calculated Pearson correlations to assess the relations of attachment anxiety and attachment avoidance to vigilance, proximity seeking, disengagement, and control (Table 3). Attachment anxiety was significantly negatively correlated with proximity-seeking ($r = -.25, p < .01$) such that those who were more anxious in their relationship to their parent were less likely to seek proximity to their parent when their parent is ill than those who are less anxious. Attachment avoidance was also negatively correlated with proximity-seeking ($r = -.48, p < .001$) such that those who were generally more avoidant in their relationship to their parent also were

less likely to seek proximity to their parent when their parent is ill than those who were less avoidant. Further, attachment avoidance was significantly negatively correlated with both vigilance ($r = -.29, p < .01$) and tendencies to assert control ($r = -.23, p < .05$) such that those who were more avoidant in their relationship with their parent were less likely than those low in avoidance to feel vigilant and to want to assert control over their parent when their parent is ill.

To assess the relative influence and potential interactions of my independent variables, I ran four separate multiple linear regression equations predicting participants' feelings of vigilance, their desire for greater proximity, their tendency to disengage, and their tendency to want to assert control over their ill parents. In each equation, on Step 1, I entered the main effects of attachment avoidance, attachment anxiety, the severity of the parent's illness, and the parent's health-related behaviours. On Step 2, I entered the 2-way interactions (attachment avoidance X attachment anxiety; attachment avoidance X illness severity; attachment avoidance X health-related behaviours; attachment anxiety X illness severity; and attachment anxiety X parent's health behaviours). On Step 3, I entered the 3-way interactions (attachment avoidance X attachment anxiety X illness severity; attachment avoidance X attachment anxiety X parent's health behaviours; attachment avoidance X illness severity X parent's health behaviours; attachment anxiety X illness severity X parent's health behaviours).

Vigilance

First, when predicting vigilance, there were several significant main effects at Step 1, which explained a significant amount of the variance in participants' tendencies to feel vigilant for signs of illness in their parents ($R^2 = .21, F(4,105) = 6.91, p < .001$). Specifically, there was a significant main effect of attachment anxiety ($\beta = .19, F(1, 105) = 4.63, p < .05$), such that

participants who were more anxious in their relationship with their parent were more likely to feel vigilant for their parent's health when their parent is ill than those who were less anxious. There was also a significant main effect of attachment avoidance ($\beta = -.37$, $F(1, 105) = 17.00$, $p < .01$), such that participants who were more avoidant in their relationship with their parent were less likely to become vigilant for signs of illness in their parents when they are ill when compared with those who were less avoidant. Finally there was a significant main effect of the parent's health-related behaviours ($\beta = -.24$, $F(1, 105) = 6.96$, $p < .01$), such that participants who reported better health behaviours on the part of their ill parents were less likely to feel vigilant of their parents' health than those who reported poorer health behaviours. The main effect of the severity of a parent's illness was marginally significant in predicting vigilance ($\beta = .16$, $F(1, 105) = 3.13$, $p = .08$), such that those who reported more severe illness tended to experience greater vigilance than those who reported less severe illness.

The addition of the 2-way interactions at Step 2 did not improve the model predicting vigilance ($\Delta R^2 = .07$, $F(6,103) = 1.48$, *n.s.*). This was also the case when the 3-way interactions were added at Step 3 ($\Delta R^2 = .07$, $F(4, 105) = .92$, *n.s.*), and as such these steps were not retained and only the results from Step 1 were interpreted.

Proximity Seeking

Next, when predicting proximity seeking, a significant main effect emerged at Step 1, which explained a significant amount of variance in participants' desire to seek proximity to their ill parents ($R^2 = .27$, $F(4,105) = 9.63$, $p < .001$). Specifically, there was a significant main effect of attachment avoidance ($\beta = -.44$, $F(1, 105) = 25.61$, $p < .001$) indicating that participants who were more avoidant in their relationship with their parent were less likely to seek proximity to

their parent when the parent is ill as compared with those who were low in avoidance. The main effects of attachment anxiety, the severity of the parent's illness, and the quality of their health-related behaviours were not significant (all $\beta < .13$, all $F < 2.2$, all $p > .1$).

The addition of the 2-way interactions at Step 2 improved the model by significantly increasing the amount of variance explained in participants' desire to seek proximity to their ill parents ($\Delta R^2 = .13$, $F(6,103) = 3.50$, $p < .01$). The main effect of attachment avoidance remained significant in the second step of the regression equation predicting proximity-seeking ($\beta = -.49$, $F(1, 99) = 32.41$, $p < .001$). Further, there were two significant interactions that made statistically significant contributions to the prediction of desire to seek proximity to an ill parent. First, a significant interaction between participants' attachment anxiety and their parents' health-related behaviours emerged at Step 2 ($\beta = .41$, $F(1, 99) = 17.95$, $p < .001$). Exploration of this interaction revealed that participants higher in attachment anxiety reported lower desires for proximity to their ill parent as they rated them as poorer in taking care of their own health. Participants lower in attachment anxiety reported higher desires for proximity seeking as they rated their parents' health-related behaviours as poorer (see Figure 1). Second, the interaction between attachment anxiety and the severity of the parent's illness was marginally significant ($\beta = .17$, $F(1, 99) = 3.62$, $p = .06$). Exploration of this interaction revealed that participants higher in attachment anxiety tended to want greater proximity with their ill parents as they perceived their parents' illness to be more severe. Participants lower in attachment anxiety reported slightly lower desires for proximity the more they perceived their parents' illness to be more severe (see Figure 2).

The addition of the 3-way interactions at Step 3 did not improve the model predicting proximity-seeking ($\Delta R^2 = .02$, $F(4, 105) = 1.00$, *n.s.*) and, as such, this step was not retained and the results were not interpreted.

Disengagement

Next, when predicting disengagement, there were no significant main effects in the first step of the regression equation and this step did not explain a significant amount of variance in participant's report of disengagement ($R^2 = .05$, $F(4, 105) = 1.23$, *n.s.*). Adding the 2-way interaction terms at Step 2, however, significantly improved the model with a significant increase in the amount of variance explained ($\Delta R^2 = .17$, $F(6, 103) = 3.57$, $p < .01$). At this step, a significant main effect of attachment anxiety ($\beta = .20$, $F(1, 99) = 4.35$, $p < .05$) emerged such that participants with greater anxiety in their relationship with an ill parent reported stronger tendencies to want to disengage from their parent and from thoughts and feelings about their parent's illness. A significant interaction also emerged at Step 2 between the severity of the parent's illness and their health-related behaviours ($\beta = .27$, $F(1, 99) = 7.68$, $p < .01$). Examination of this interaction revealed that health behaviours had a pronounced influence on desire to disengage when parental severity of illness was low, but had almost no influence on desire to disengage when parental severity of illness was high (see Figure 3). The interaction between attachment avoidance and the severity of the parent's illness was marginally significant at Step 2 ($\beta = -.18$, $F(1, 99) = 3.13$, $p = .08$). Examination of this interaction revealed that participants who were lower in attachment avoidance tended to report increasing levels of disengagement as they viewed their parents' illness to be more severe whereas those higher in

attachment avoidance tended to report decreasing levels of disengagement as they viewed their parents' illness to be more severe (see Figure 4).

The addition of the 3-way interactions at Step 3 did not improve the model predicting disengagement ($\Delta R^2 = .06$, $F(4, 105) = 1.89$, *n.s.*) and, as such, this step was not retained and the results were not interpreted.

Control

Finally, when predicting control, two significant main effects emerged at Step 1 which explained a significant amount of variance ($R^2 = .18$, $F(4, 105) = 5.75$, $p < .001$). Specifically, there was a significant main effect of attachment avoidance ($\beta = -.26$, $F(1, 105) = 7.69$, $p < .01$) such that those who were more avoidant in their relationship with their ill parent were less likely to want to assert control over their parents when their parent is ill. There was also a significant main effect of the parent's health-related behaviours ($\beta = -.27$, $F(1, 105) = 8.96$, $p < .01$) such that those who viewed their parents as engaging in more positive health-related behaviours were less likely to want to assert control. Finally, the main effect of illness severity was marginally significant ($\beta = .18$, $F(1, 105) = 3.81$, $p = .054$) such that participants who reported having a more severely ill parent tended to report a greater desire to assert control over their ill parent.

The addition of the 2-way interactions at Step 2 did not improve the model predicting control ($\Delta R^2 = .06$, $F(6, 103) = 1.20$, *n.s.*). This was also the case when the 3-way interactions were added at Step 3 ($\Delta R^2 = .02$, $F(4, 105) = 0.76$, *n.s.*), and as such these steps were not retained and only results from Step 1 were interpreted.

Study 1 Discussion

The purpose of Study 1 was to investigate the behavioural and emotional responses of adult children when confronted with a threat to their parent's health. Given the paucity of research in this area of study, my goal was to obtain a general understanding of what behaviours are manifest in adult children when a parent becomes ill, and to explore some potential individual difference variables which may influence behavioural predispositions. In particular, I considered responses of vigilance, proximity-seeking, disengagement, and asserting control of parents in a sample of participants for whom a parent's mortality has become explicitly salient. I expected that feelings of vigilance might underlie approach behaviours of proximity-seeking and asserting control and, indeed, found that participants who reported stronger feelings of vigilance tended to report stronger tendencies to want to seek proximity to or to assert control over an ill parent.

My primary hypotheses regarding potential individual difference variables that may influence an adult's behavioural response to their parent's mortality considered the role of attachment anxiety and attachment avoidance. I predicted that those who generally experience greater anxiety in their relationship with a parent would report stronger tendencies to become vigilant, to seek proximity, and to become controlling of their parent when he or she becomes ill and to report lower tendencies to want to disengage from him or her. For those who are generally more avoidant in their relationship with a parent, I expected stronger tendencies toward disengagement and lower experiences of vigilance, desires for proximity, and tendencies to assert control over their parent when he or she becomes ill.

In regression analyses, attachment anxiety was predictive of stronger feelings of vigilance, when controlling for the roles of attachment avoidance, the severity of a parent's illness and their health-related behaviours (as well as potential interactions between these variables). This is consistent with my hypothesis as well as with previous literature in the field of attachment theory which finds that people who experience significant anxiety in their attachment relationships tend to direct their attention toward sources of threat or distress in a vigilant manner (Mikulincer & Florian, 1995; 1998). No associations were found between participants' attachment anxiety and tendencies to want to assert control over parents; therefore, this hypothesis was not supported.

In correlational analyses, I found a significant association between attachment anxiety and proximity-seeking such that those who experience greater anxiety reported lower desires for proximity with their ill parents. In regression analysis, when controlling for the same variables and interactions listed above, greater attachment anxiety was predictive of stronger tendencies to want to disengage from an ill parent. Notably, both of these findings were in the opposite direction of my stated hypotheses.

Turning back to recent research (Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010) and early research in attachment theory (Ainsworth et al., 1978) may shed some light on these findings. In Ainsworth's and colleagues classification of attachment style, attachment anxiety was conceptualized as "ambivalence" in these relationships. That is, highly anxious individuals simultaneously hold both positive and negative views of their relational partners as well as closeness in general. While they have a strong desire for closeness and connection, they also intensely fear the potential negative outcomes of getting close (i.e., rejection, abandonment).

Mikulincer and colleagues (2010) have recently considered this ambivalent nature in adults who are high in attachment anxiety. These researchers found conflicting approach and avoidance motives and simultaneous positive and negative attitudes when people high in attachment anxiety thought about close relationships. Further, they found this ambivalence to be stronger after participants were asked to think about the dissolution of a relationship. The death of a parent leads to the ultimate dissolution of this primary attachment relationship. As such, it makes sense that these individuals, who are already highly anxious about the possibility of being abandoned, may become overwhelmed at the thought of their parent's death, thus prompting them to refrain from seeking proximity to their attachment figure and to disengage through attempts to avoid reminders of their parents' mortality.

Although I had no specific hypotheses regarding interactions in the current study, interactions between dimensions of attachment anxiety and avoidance would identify differences based on the four attachment styles delineated by these two orthogonal dimensions. No significant interactions emerged between the two attachment dimensions; however, there were a couple of significant interactions between attachment dimensions and other predictor variables. In terms of attachment anxiety, a significant interaction with the quality of a parent's health-related behaviours emerged when predicting proximity-seeking. That is, participants who reported greater attachment anxiety were less likely to seek proximity to their ill parents when they viewed their parents as engaging in poor health-related behaviours whereas those who reported lower attachment anxiety were more likely to seek proximity to their parents who engaged in poor health-related behaviours. One possibility is that those who are highly anxious may become even more anxious when they feel that their parent is not taking proper care of their health and be less likely to seek proximity than those who are anxious but feel that at least their

parent is doing whatever is possible to decrease their risk of mortality. Those who are low in attachment anxiety, on the other hand, may not be quite so overwhelmed by their parents' illness and may seek greater proximity when they feel that their parent is not taking proper care of their health perhaps in attempts to help support them in remedying these behaviours.

When considering the role of attachment avoidance in correlational analyses, I found significant associations with proximity-seeking, vigilance, and controlling behaviours such that those who are more avoidant in their relationship with an ill parent are less likely to experience feelings of vigilance and are less likely to have tendencies to want to seek proximity or to assert control over their parent. When controlling for the role of attachment anxiety, the severity of a parent's illness and their health-related behaviours (as well as potential interactions between these variables), greater attachment avoidance continued to be predictive of lower feelings of vigilance and lower tendencies to want to seek proximity or assert control over their parent. These findings were all in line with my hypotheses as well as with attachment theory (Mikulincer & Florian, 1998). Those who are high in attachment avoidance are less likely to seek emotional closeness and proximity. They also tend not to acknowledge distress, which manifests in the present study with individuals high in avoidance reporting low feelings of vigilance for signs of illness in their parents. It follows that these individuals would not feel compelled to assert control over their parents' health care. Notably, however, there was no association between attachment avoidance and participants' tendencies to want to disengage from their parents, in contrast to my predictions.

The current study also found significant associations between the parents' health status and the behavioural predispositions of their children. Specifically, participants reported stronger

tendencies to want to assert control over their parents when they viewed their parents' illness as more severe and when they felt that their parents were taking poorer care of their health.

Participants who rated their parents' health-related behaviours as poorer also reported stronger feelings of vigilance for signs of illness in their parent. These associations also emerged in regression analyses, when controlling for attachment anxiety, attachment avoidance (as well as potential interactions between all of these variables). These associations were in line with my hypotheses and with prior research, which has identified controlling behaviours in caregivers of parents and spouses (Cicirelli, 2000; Tucker & Anders, 2001). The severity of a parent's illness was not significantly associated with participants' tendencies to seek proximity or to disengage from their parents and only trended toward a significant association with participants' feelings of vigilance. Interestingly, the severity of a parent's illness and their health-related behaviours interacted in predicting participants' tendencies to want to disengage from their parents. When a parent's illness was viewed as less severe, participants were more likely to want to disengage when they also felt that their parent's health-related behaviours were poor. One possibility is that these participants disengage from frustration or being overwhelmed when their parents are very ill and yet do not take good care of their health.

Preliminary analyses found that older participants (and those with older parents) were less likely to report a tendency to want to disengage from their ill parents. While I made no specific hypotheses relating to age of participants or their parents, some research has found that as people age, they become more accepting of this process and their eventual mortality and are less likely to avoid thinking about these aspects of life (Gill, 2008). As such, it makes sense that older participants in the current study were less likely to disengage from their emotional processes surrounding their parents' mortality.

Interestingly, participants who reported that they served in the role of caregiver for their parents were more likely to want to disengage from their parents than those who reported that they did not serve this role. Further, those who reported higher levels of caregiver burden (i.e., consumption of physical and emotional energy) reported greater disengagement and stronger feelings of vigilance. The measure of disengagement asked participants to rate their tendencies to suppress thoughts and feelings about their parents' health as well as to avoid thinking about or having contact with their parents. While these results are contrary to my hypotheses, it is in hindsight not surprising that caregivers who may feel quite overwhelmed by their level of responsibility for their parents may wish that they could disengage somewhat from this role. Indeed, participants who served as caregivers reported that these duties consumed a considerable amount of their physical [$M=4.90$ (on a 7 point scale), $SD = 1.47$] and emotional [$M=5.79$ (on a 7 point scale), $SD = 1.24$] energy.

In sum, Study 1 has identified that adult children sometimes become vigilant for signs of illness in their parents and may seek proximity to, disengage from, or assert control over their parents when they become ill. These behaviours vary depending on the child's attachment relationship with the parent at the time of his/her illness, as well as other variables such as the age of the parent and child, the severity of the parent's illness and their health-care behaviours, and the degree of caregiver burden experienced by the adult child.

Study 2

Study 1 helped to understand how adults respond when a parent's mortality becomes salient. It did so by assessing, at an explicit level, their self-reported feelings of vigilance and desires to seek proximity to, disengage from, or control their parent. In Study 2, I included the same self-report questionnaires with the goal of replicating the findings from Study 1. Further, I extended the examination of parent-mortality salience by assessing implicit tendencies toward proximity seeking, disengagement, and over-control.

Memories and feelings need not be in awareness to play a role in behaviour, and non-conscious processes can be assessed using implicit methodologies (Roefs et al., 2011; Wegner & Smart, 1997). Researchers in both the Attachment Theory and Terror Management Theory traditions have begun to use these methods to assess implicitly the cognitive activation of relevant themes. According to Wegner and Smart (1997), cognitive activation refers to the accessibility of thoughts that influence behaviour but are outside of awareness. It can be assessed by examining whether performance is hindered or facilitated on cognitive tasks which contain themes related to thoughts believed to be activated (Wegner & Smart, 1997). Assessing implicit thoughts and feelings using cognitive tasks also reduces the influence of defensive strategies and reporting biases and therefore serves as a good supplement to self-report methods when these processes may be involved.

Implicit research in Attachment Theory

Implicit research in the field of Attachment Theory has recently begun to explore the internal experiences of individuals high in attachment insecurity (Fraley, Davis, & Shaver, 1998; Fraley & Shaver, 1997; Mikulincer, Dolev, & Shaver, 2004; Mikulincer, Birnbaum, Woddis, &

Nachmias, 2002; Mikulincer, Gillath, & Shaver; 2002; Mikulincer & Orbach, 1995; Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010; Shaver & Mikulincer, 2002). Given that attachment insecurity appears to develop as a defensive strategy, it follows that behavioural observations and conscious claims of attachment-related distress may not fully reflect the unconscious dynamics of these individuals (Fraley, Davis, & Shaver, 1998; Shaver & Mikulincer, 2002). Whereas those high in attachment anxiety appear to have consistency between their internal and external experience, there have been divergent findings regarding the internal experiences of those high in attachment avoidance. At an explicit level, those high in avoidance generally distance themselves from interpersonal closeness and emotional intimacy and do not acknowledge distress. The degree to which attachment themes are accessible at an implicit level reflects back on the question of how successful individuals high in attachment avoidance are in deactivating the attachment system (Fraley, Davis, & Shaver, 1998). To date, this question has not been widely studied and has been complicated by the range of instruments used to assess attachment avoidance.

Some studies suggest that adults high in attachment avoidance are quite successful in deactivating the attachment system and suppressing emotional distress. For example, Fraley and Shaver (1997) assessed the accessibility of loss-related thoughts after prompting participants to suppress thoughts of their romantic partner abandoning them. Those high in attachment anxiety but low in attachment avoidance (i.e., preoccupied) demonstrated the typical rebound effects of suppression by flagging more loss-related thoughts; however, those high in avoidance but low in anxiety (i.e., dismissing), flagged fewer loss-related thoughts when asked to suppress them (Wegner, 1989). Notably, recent research in the area of suppression (Purdon & Clark, 2000) has indicated that rebound effects have not been found consistently and has highlighted methodological issues in Wegner's early work demonstrating rebound effects, which are also

inherent in the Fraley and Shaver (1997) study. Further, in this study, loss-related thoughts were assessed by having participants place a mark each time a thought occurred, which arguably can still be considered a self-report method that would be susceptible to defensive strategies. Also in this study, however, dismissing-avoidance was negatively correlated with physiological arousal as assessed by skin conductance level (SCL) during the thought suppression exercise. This suggests that participants may not have experienced significant emotional distress during the task (Fraley & Shaver, 1997).

In another study, Mikulincer, Gillath, and Shaver (2002) used the lexical-decision task to assess the accessibility of the names of attachment figures. This task requires participants to identify, as quickly as possible, whether strings of letters presented on a computer screen are words or not. The assumption is that when a particular theme is made more cognitively accessible, words related to that theme will be identified as words more quickly (Fischler & Bloom, 1979). These researchers (Mikulincer, Gillath, & Shaver, 2002) used participant-specific names of attachment figures in the lexical-decision task to assess accessibility following threatening and neutral prime words. As a control, they also assessed accessibility of the names of other close persons, known persons and unknown persons and found no effects based on prime or attachment style. In general, those who were primed with the threatening words “failure” or “separation” demonstrated greater accessibility (i.e., faster reaction time) of the names of attachment figures than those who were primed with the neutral words “hat” or “umbrella.” Those high in attachment anxiety demonstrated greater accessibility of the names of attachment figures regardless of the nature of the prime word, demonstrating a ‘hyperactivation’ of the attachment system. While attachment avoidance was unrelated to the accessibility of attachment figures following the “failure” prime, those high in attachment avoidance actually

demonstrated lower accessibility of attachment figures' names following the "separation" word prime. These results suggest that those high in attachment avoidance successfully inhibit activation of attachment themes when there is a threat to the attachment relationship. The same pattern of results was replicated using the emotional Stroop task, which required participants to name the colour in which attachment figures' names were printed. In this task, slower reaction time suggests that the themes represented by the words are more cognitively accessible, leading to greater distraction in naming the print colour.

In contrast to these studies showing that adults high in attachment avoidance are quite successful in deactivating the attachment system and suppressing emotional distress, other work has suggested that attachment-related concerns and distress may still be implicitly accessible for these individuals. Mikulincer, Florian, and Tolmacz (1990) assessed both implicit and explicit fear of death in relation to attachment style categories (i.e., secure, anxious-ambivalent, avoidant). At an explicit level, those categorized as anxious-ambivalent reported greater death anxiety than those categorized as secure or avoidant. However, both anxious-ambivalent *and avoidant* individuals demonstrated greater implicit death anxiety than did secure individuals when the centrality of death and death anxiety in TAT stories was examined.

Mikulincer, Birnbaum, Woddis, and Nachmias (2000) used a cognitive load condition to examine avoidant persons' defensive suppression of attachment worries. These researchers conducted three studies using lexical-decision tasks to assess the accessibility of proximity words and distance words (i.e., attachment worries) following threatening and neutral primes. Across all three studies, participants responded more quickly to proximity words following a threat word prime than following a neutral word. Notably, anxious individuals demonstrated faster reaction

times to both proximity words and distance words regardless of whether the prime was neutral or threatening. One study required participants to complete the lexical-decision task under cognitive load, such that they were required simultaneously to complete another cognitive task. Under cognitive load, avoidant individuals, like anxious individuals, demonstrated faster reaction times to distance words than did secure individuals. These results suggest that avoidant persons may pre-consciously experience the activation of attachment themes but are successful in suppressing them defensively when their cognitive resources are not limited by other tasks.

Mikulincer, Dolev, and Shaver (2004) also made use of a cognitive load condition to tax the attentional resources of participants during a cognitive task. Participants were first asked to recall a painful breakup or a separation from a romantic partner and then complete a 5-minute stream-of-consciousness task. Half of the participants were instructed to suppress thoughts about the recalled separation during the stream-of-consciousness task whereas the other half were given no restrictions. Next, participants completed a Stroop task with separation-related words, negatively valenced attachment-unrelated words, and neutral words, during which half of the participants performed a task with low cognitive load and the other half completed a task with high cognitive load. Whereas participants high in attachment avoidance did not demonstrate an increase in accessibility of separation thoughts under low cognitive load, their ability to identify the color of separation words was adversely affected under high cognitive load, suggesting that they were no longer able to suppress these thoughts. Further, even in the control condition in which participants were not instructed to suppress these thoughts, those high in avoidance demonstrated greater accessibility of separation thoughts under high cognitive load than under low cognitive load, suggesting that they spontaneously attempted to suppress these thoughts even when not instructed to do so.

Fraley, Davis, and Shaver (1998) proposed a mechanism whereby those high in attachment avoidance are successful in keeping the attachment system deactivated by creating a cognitive and social environment that reduces the frequency of attachment reminders. As such, they are able to go about their day-to-day activities without distress. However, when presented with severe and persistently stressful situations, they begin to demonstrate signs of distress and maladjustment (Mikulincer & Florian, 1998). They also demonstrate heightened physiological arousal when directly confronted with attachment themes, such as in an attachment interview (Dozier & Kobak, 1992). Fraley, Davis, and Shaver (1998) suggested that dismissing adults may also become distressed when threatened with separation from someone in whom they are emotionally invested. Given the long history of the parent-child attachment relationship, it is likely that this investment is significant and that direct threats of separation from these attachment figures will lead to some form of distress, regardless of attachment style.

To explore more fully the responses of adults to considering the mortality of a parent and to consider the role of attachment style, Study 2 used an implicit approach to assess the accessibility of potential themes related to this response. The methodology used is drawn from research in Terror Management Theory (TMT; Greenberg, Solomon, & Pyszczynski, 1997; Pyszczynski, Greenberg, & Solomon, 1997), which considers people's response to considering their own mortality. Reminders of a parent's mortality may indirectly elicit thoughts of one's own mortality (Martens, Greenberg, Schimel, & Landau, 2004). As such, this theory is relevant to the present research, which compares the response of young adults to thinking about the death of their mother to thinking about their own death (as well as to thinking about an experience of physical pain). This theory will be reviewed briefly before discussing the specific methodology used in the present study.

Terror Management Theory

Like Attachment Theory, TMT is founded in basic evolutionary processes. Within TMT, fear of death is understood as stemming from two core components of human nature. First, like all other animals, humans are engrained with a self-preservation instinct to prolong their lives and the lives of their offspring. Humans are presumably distinct from other animals, however, in that they have advanced cognitive capabilities of self-reflection and contemplation of past and future events, and as such, have awareness that death is inevitable. According to TMT, this awareness of the inevitability of death juxtaposed with the instinct of self-preservation leads to a great deal of anxiety and fear (Greenberg et al., 1997; Pyszczynski et al., 1997).

TMT originally proposed two factors that allow people to function in their daily lives without being consumed by the awareness of their own mortality. First, one's cultural worldview (e.g., values, beliefs, standards of behaviour) affords a sense of order and purpose to life and establishes a means by which people can transcend death and achieve symbolic immortality (e.g., ongoing physical contributions which remain after death, such as children, money, or other culturally valued achievements). Second, living up to culturally determined standards or values can also engender a sense of personal worth, or self-esteem, that one is a valuable member of society. High self-esteem prompts feelings that one has positively contributed to society, which provides a sense that one's purpose in life has been fulfilled and that evidence of one's contributions will continue even after death. Thus, according to Terror Management Theory, cultural worldview and self-esteem provide the means by which people can manage and cope with the anxiety and fear stimulated by the inevitability of death (Greenberg et al., 1997; Pyszczynski et al., 1997). A broad literature supports the theory that

faith in a meaningful reality (provided by one's cultural worldview) as well as the belief that one is a valuable person who meets the standards set by society (provided by self-esteem) serve to buffer the anxiety that comes from the awareness of one's own mortality (see Solomon, Greenberg, & Pyszczynski, 2004, for a review).

Attachment theorists have proposed that close relationships also serve a critical function in dealing with the self-preservation instinct and the inevitability of death (Mikulincer, Florian, & Hirshberger, 2003; 2004; Hart, Shaver, & Goldenberg, 2005). Several aspects of close relationships enable them to serve a terror management function. Tying in with previous TMT research, close relationships provide fulfillment of a culturally valued behaviour (Baumeister & Leary, 1995) and are often an important source of self-esteem (Leary, 1999). The support and comfort provided by close relationships, at least for those who are secure in their attachment, serves to regulate distress in general and in response to mortality salience (Mikulincer & Florian, 1998; Mikulincer, Florian, & Hirshberger, 2003; 2004). Close relationships also have an evolutionary significance such that they sustain and enhance life and increase the chances of having offspring that survive to maturity. Through our offspring, close relationships offer a symbolic promise of continuity (Lifton, 1973), which may satisfy our self-preservation instinct (Mikulincer, Florian, & Hirschberger, 2004). Further, close relationships provide connections to the social world and increase the likelihood that one will be remembered after death (Florian & Kravetz, 1983; Mikulincer, Florian & Hirshberger, 2003; 2004).

Indeed, several studies from a Terror Management Theory standpoint have supported the hypothesis that the attachment system serves to buffer the anxiety associated with one's own mortality. Importantly, the extent to which close relationships are likely to be effective in

buffering the anxiety associated with mortality salience likely depends on the security experienced within these relationships. Across various studies, attachment style has often been found to moderate the use of close relationships as a terror management function (Mikulincer & Florian, 2000; Mikulincer, Florian, Birnbaum, & Malishkevich, 2002; Taubman-Ben-Ari, Findler, & Mikulincer, 2002).

The present study

Returning to the present study, TMT research has used implicit methodology with an induction designed to make one's own mortality salient (i.e., "Please briefly describe the emotions that the thought of your own death arouses in you" and "Jot down, as specifically as you can what you think will happen to you as you physically die and once you are physically dead"). The current study used the same induction for one group of participants and a modified induction designed to make a parent's mortality salient for another group (i.e., "Please briefly describe the emotions that the thought of your mother's death arouses in you" and "Jot down, as specifically as you can what you think will happen to your mother as she physically dies and once she is physically dead"). A third, control, group was asked to think about an experience of physical pain. As in Study 1, I proposed that when a parent's mortality is salient, adult children might respond by seeking greater proximity to their parent, by disengaging from their parent, and/or by becoming over-controlling of their parent. As such, I explored the accessibility of these themes following the induction of a parent's mortality salience (vs. personal mortality salience and physical pain).

To assess the extent to which these themes are accessible, I used a word completion task in which individual words with missing letters were flashed on a computer screen. The words

included reflected the themes of proximity, disengagement, or control as well as neutral words matched to the themed words on a variety of lexical characteristics. Participants were instructed to identify the words as quickly as possible and reaction times were recorded for both themed and neutral words. The word completion task is expected to demonstrate facilitated responses such that greater cognitive accessibility of a particular theme will speed up recognition of words related to that theme, thus decreasing reaction times. As such, the extent to which these themes are accessible can be assessed.

Across all conditions, I expected general differences in response times to themed and target words depending on attachment dimensions of anxiety and avoidance. Specifically, I proposed two 2-way interactions between word type and each attachment dimension. I hypothesized that those higher in attachment anxiety would be faster at identifying proximity themed words as compared to matched neutral words and also faster at identifying proximity words than those low in attachment anxiety. Further, I hypothesized that those higher in attachment avoidance would be faster at identifying disengagement themed words as compared to matched neutral words and also faster at identifying disengagement themed words than those low in attachment avoidance.

I also expected differences in reaction times to themed versus neutral words to be related both to attachment dimensions and to which prime was completed prior to the word completion task (i.e., condition). Specifically, I predicted several 3- and 4-way interactions. First, in the physical pain condition, I hypothesized the above stated pattern of response times based on attachment anxiety and attachment avoidance. As per previous research in TMT, I hypothesized that asking participants to imagine and describe their own death would activate the theme of

proximity in an attempt to buffer anxiety. Greater accessibility of this theme would accordingly facilitate the recognition of proximity related words for all participants but moreso for those high in attachment anxiety. Restated, I predicted that participants in the self-mortality salience condition would identify proximity themed words more quickly than their matched neutral words and that this effect would be moderated by attachment anxiety, such that the facilitation effect would be greater among those high in attachment anxiety than those low in attachment anxiety.

Because considering a mother's mortality is also apt to trigger attachment fears, I predicted the same pattern of results in the mother mortality salience condition. Specifically, I expected that all participants in this condition would identify proximity themed words more quickly than their matched neutral words and that this effect would be moderated by attachment anxiety with those high in anxiety demonstrating the fastest reaction times for proximity themed words. Given the added complexity of considering a mother's mortality such that the mother represents the source of anxiety, I proposed further hypotheses regarding thoughts of control and disengagement. Specifically, I predicted that participants asked to imagine and describe their mother's death would respond more quickly to words related to the theme of control than to their matched neutral words and more quickly to words conveying the theme of disengagement versus their matched neutral words. Further, I predicted that these effects would be moderated by participants' attachment relationship with their mothers. Those high in attachment anxiety, for whom attachment fears are particularly salient, were expected to demonstrate facilitated recognition of control themed words as compared with their matched neutral words and, as such, the main effect for control themed words was expected to be amplified for those high in attachment anxiety. Those high in attachment avoidance, who are predisposed to avoid attachment figures, were expected to demonstrate facilitated recognition of disengagement words

as compared with their matched neutral words across all conditions. Therefore, in the mother-mortality salience condition, I expected that the main effect for facilitated identification of disengagement words would be moderated by attachment avoidance such that those high in avoidance would demonstrate the fastest reaction times to disengagement words.

Study 2 Method

Participants

Participants were recruited through the University of Waterloo undergraduate students Research Experiences Group (REG) pool. Participants were required to have English as their first language and to have normal or corrected-to-normal vision. Participants received a research participant credit toward their course in exchange for their participation.

A total of 113 participants were recruited, however, data from seven participants were unusable due to computer problems or participant difficulties in completing the tasks due to anxiety or reading difficulty. This resulted in a final sample of 106 participants (83 women and 23 men) ranging in age from 18 to 51 years ($M = 20.05$ years, $SD = 3.68$). The majority of participants identified as Caucasian ($N = 70$, 66%) and the remaining identified as Asian ($N = 15$, 14.1%), East-Indian ($N = 8$, 7.5%), Black/African ($N = 2$, 1.9%), or of another ethnicity ($N = 8$, 7.5%). Three participants declined to indicate their ethnicity ($N = 3$, 3%). Participants were randomly assigned to one of the three conditions (as described below). The final sample included 37 participants who wrote about their mother's death, 35 participants who wrote about their own death, and 34 participants who wrote about an experience of physical pain.

Word Selection

Pilot work was conducted to develop a list of target words to use in the word completion task. A comprehensive list was generated containing words reflecting the themes of proximity, disengagement, and control and their synonyms from the Merriam Webster dictionary and

thesaurus (Merriam-Webster's Collegiate Dictionary, 2005). For each selected word, a neutral word matching in number of letters, syllables, and word frequency [based on Kucera & Francis' (1967) norms] was obtained using the MRC Psycholinguistic database (Wilson, 1988). Efforts were made to match words based on orthographic neighborhood (i.e., number of words that can be made by changing only one letter of the original word) and parts of speech (e.g., noun, verb, adjective) when possible but precedence was given to match words based on number of letters, syllables, and frequency.

Ten psychology graduate students then rated on a 7-point Likert type scale ranging from 1 (Not at all) to 7 (Very much) the extent to which each of the 134 target and 134 neutral words reflected each theme of proximity, control, and disengagement. Ten words with the highest mean ratings for each theme were selected for use in the study. Words with elevated ratings (i.e., greater than 3.5) on more than one scale were eliminated to ensure that selected words did not reflect more than one theme. Mean ratings for themed words ranged from 5.22 to 7.00 ($M = 6.26$, $SD = 0.45$) for proximity related words, from 5.67 to 7.00 ($M = 6.45$, $SD = 0.21$) for controlling words, and from 5.78 to 7.00 ($M = 6.31$, $SD = 0.31$) for disengagement words. Matched neutral words all obtained ratings less than 2 for all three themes.

Stimuli Construction

Next, I ran a pilot study to ensure that target and matched neutral words were similar in naming difficulty once letters were removed from the words. First, for each target word and its

matched neutral word, I removed letters from the same position. To determine which letters to remove, I created stimuli that would be difficult but not impossible to identify while ensuring that it was not possible for any other word to be created if other letters were used to fill in the blanks. Once a set of stimuli was created, five psychology graduate students were recruited to pilot the word completion task. A number of items were found to be too challenging and, as such, were reconfigured and piloted again with a second group of five graduate students. Undergraduates were then recruited through the Research Experiences Group pool to complete the word completion task. After the first five participants, mean reaction times for each word were calculated and differences between target words and their matched neutral words were assessed. Several word pairs were found to have large differences and, as such, the stimuli were reconfigured to make them more similar in difficulty. After another five participants, mean reaction times for each word were reassessed and differences between word pairs were found to be minimal (i.e., less than 300 ms in difference between each target word and the matched neutral word). An additional 23 undergraduates completed the word completion task, resulting in a final sample of 33 participants.

Incorrect trials and mistrials were excluded from analysis and, as such, mean reaction time for each word was calculated based on responses from 25 to 31 participants (Table 4). Mean reaction times for each group of target and matched neutral words were calculated and found to be comparable. The mean reaction time for all proximity words was 1609 ms ($SD = 335.74$ ms) while the reaction time for their matched neutral word was 1648 ms ($SD = 346.71$ ms). Disengagement words had a mean reaction time of 1598 ms ($SD = 262.36$ ms) while their matched neutral words had a mean reaction time of 1543 ms ($SD = 304.01$ ms). Finally, the mean reaction time for controlling words was 1900 ms ($SD = 506.60$ ms) and 1950 ms ($SD = 548.47$

ms) for their matched neutral words. Mean reaction times for each word were entered into a one-way Analysis of Variance which found no significant differences in reaction time based on word type ($F(5, 54) = 1.87, n.s.$)

The final task had 10 words representing each theme of proximity, disengagement, and control as well as a matched neutral word for each themed word, resulting in a total of 60 trials. The order of the trials was randomized.

Measures

Relationship Questionnaire (RQ). As part of a Mass Testing questionnaire administered to undergraduates prior to coming into the lab, participants completed the Relationship Questionnaire (Bartholomew & Horowitz, 1991) rating how well each attachment style (Secure, Fearful, Preoccupied, and Dismissing) pertained to their relationships in general as well as to their relationships to their mother and their father. For the purpose of this study, only participant's ratings with respect to their relationship with their mother were used as I only targeted the mother's mortality in the parent mortality salience condition.

Parental Mortality Salience. Participants completed the same scale used in Study 1 to assess the extent to which they feel vigilant for signs that their mother is ill and their desires to seek proximity to, disengage from, and control their mother's behaviour when they think about potential harm coming to her. This scale was included to replicate correlation results of Study 1 between attachment dimensions (i.e., anxiety, avoidance) and these behaviours. The scale was administered following the word completion task to avoid any confounding effects on the task.

Upset. After completing the word completion task, participants were asked to indicate how upsetting they found the induction task. Ratings were made using Likert-type scaling, ranging from “Not at all” (1) to “Very Upsetting” (7).

Procedure

Prior to coming in for the laboratory portion of the study, participants completed The Relationship Questionnaire (RQ) as part of a Mass Testing questionnaire administered to participants in the Research Experiences Group (REG). Participants were able to view a brief description of studies for which they were eligible on the REG website and could choose to sign up for any of these studies. The description of this study indicated that the study was looking at how quickly undergraduate students are able to identify a word that is presented with missing letters after writing about their thoughts and feelings about one of 10 potential events (including their own death, their mother’s death, and an experience of physical pain).

When participants arrived in the lab, they were asked to select a coloured piece of paper from a small box to determine which event they would write about. Next, the experimenter selected the appropriate file folder to match the colour of the selected piece of paper and removed the induction prompt sheet. Although participants were led to believe that their paper selection could result in any of the ten potential events, the folders contained only the three events of interest (writing about their own death, the death of their mother, or an experience of physical pain). Participants were asked to “Please briefly describe the emotions that the thought of [your own death/your mother’s death/an experience you have had of intense physical pain] arouses in you” and to “Jot down, as specifically as you can what you think will happen [to you as you physically die and once you are physically dead/to your mother as she physically dies and

once she is physically dead /as you think about that experience of intense physical pain].” The experimenter presented the induction sheet and read the instructions aloud before leaving the room so that the participant could write down his/her thoughts and feelings about the selected event.

When the participant finished writing, the experimenter returned to the lab room and introduced the participant to the computer task. Participants completed ten practice trials before beginning the actual word completion task. While the participant was completing the task the experimenter again left the room and observed the participant completing the task through a one-way mirror in order to record the participant’s responses.

The word completion computer task required participants to identify the word containing missing letters that was represented on the computer screen. Stimuli were presented on a 17-inch monitor. E-Prime (Psychology Software Tools, 2002) was used to control timing, stimuli presentation, and to record responses. The stimulus display began with a white fixation cross (+) at the centre of the screen on a black background. The cross was followed by a word containing missing letters in white Arial font. Because the software only registers the latency with which participants indicate the word, the experimenter listened to responses over a monitor and recorded whether the participant’s response was correct, incorrect, or a mistrial (i.e., microphone reaction was premature or delayed).

Following administration of the computer task, the experimenter returned and asked participants to rate the extent to which they found the written task upsetting. Next, participants were asked to complete the Mortality Salience questionnaire that was used in Study 1. Finally,

participants completed a positive mood induction, were assessed for insight or suspicion as to the purpose of the experiment, and were fully debriefed.

Study 2 Results

Replication of Study 1 Correlations in Self-Reports

Study 1 found significant correlations between attachment anxiety and avoidance with self-reported tendencies to be vigilant for signs of illness in a parent and to seek proximity to and become controlling of a parent when thinking about the parents' mortality. Study 2 replicated these results when these behaviours were correlated with participants' attachment dimensions in their relationship with their mother. That is, participants high in attachment anxiety in their relationship with their mother were less likely to report a desire to seek proximity to her when thinking about potential harm coming to her ($r = -.28, p < .05$). Further, those high in attachment avoidance in their relationship with their mother were less likely to report a desire to seek proximity to her ($r = -.42, p < .001$), to become vigilant for signs of illness ($r = -.25, p < .05$), and to become controlling of her ($r = -.31, p < .01$) when thinking about potential harm coming to her. See Table 3 for all correlations compared with correlations found in Study 1.

Word Completion Computer Task Error Analysis

First, correct, incorrect, and mistrial data were separated. Of a total of 6360 trials (60 trials per participant), 5417 trials (85.2%) were correct, 589 trials (9.3%) were errors, and 354 trials (5.6 %) were mistrials. To determine whether the number of errors differed based on condition or word type, the number of errors for each participant was categorized by word type and a repeated measures Analysis of Variance (ANOVA) was conducted with one between subjects factor [Condition: 3 (Own death, Mother's death, Physical pain)] and two within subjects factors [Word type: 3 (Proximity, Control, Disengagement) and Target: 2 (Target, Neutral)]. The ANOVA revealed a significant main effect of Word Type ($F(1, 102) = 14.85, p <$

.001) such that participants made more errors in identifying controlling words and their matched neutral words than disengagement words and their matched neutral words. There was also a significant main effect of Target ($F(1, 103) = 5.76, p < .05$) such that participants made more errors on matched neutral words than on target words overall. These main effects were qualified by a significant two-way interaction between Word Type and Target ($F(1, 102) = 15.37, p < .001$). Participants made fewer errors on proximity and disengagement themed target words than on their respective matched neutral words but made more errors on control themed target words than on their matched neutral words (Appendix E, Figure 5). It is possible that participants began to recognize the themes of proximity and disengagement throughout the task, which facilitated their performance on subsequent items. Indeed, during debriefing participants often indicated that they had noticed the theme of closeness. Participants' difficulty with control themed words is paralleled by their slower reaction times found in the following main analysis. Notably, there were a couple of longer words in this group (as well as in the neutral words matched to control themed words), which may have made them more difficult to solve in the word completion task. Further, it is possible that idiosyncratic differences in the letters which were removed to generate the word completion task lead to differences in difficulty.

Main Analysis

Next, all errors, mistrials, and outliers were removed from the data set. To determine outliers, Z-scores were calculated for each trial based on each participant's own mean reaction

time for words of each word type and target. One hundred and sixteen trials (2% of correct trials) with Z-scores of an absolute value greater than 2.5 were excluded.

To test my hypotheses, a repeated measures ANOVA was conducted with one between subjects factor [Condition: 3 (Own death, Mother's death, Physical pain)], and two within subjects factors [Word type: 3 (Proximity, Control, Disengagement) and Target: 2 (Target, Neutral)]. Further, attachment dimensions of anxiety and attachment were entered as covariates.

A significant main effect of word type emerged ($F(1, 99) = 22.64, p < .001$) such that participants were quicker to identify proximity and disengagement words than controlling words ($M = 1470$ ms and 1451 ms versus 1891 ms respectively). Notably, this pattern of results was similar during pilot testing when no priming manipulation was used. In the present analysis, there was also a significant main effect of target ($F(1, 99) = 18.60, p < .001$) such that participants were quicker to identify target words than matched neutral words ($M = 1452$ ms versus 1756 ms). Finally, there was a main effect of condition ($F(1, 100) = 3.33, p < .05$) such that participants were faster at identifying words after thinking about their own death or physical pain than they were after thinking about their mother's death ($M = 1471$ ms and 1582 ms versus 1759 ms respectively). There were no significant interactions between word type, target, and condition.

There were no significant main effects when I considered the covariates of attachment anxiety ($F(1, 100) = .07, n.s.$) and attachment avoidance ($F(1, 100) = 1.14, n.s.$), indicating that attachment was not related to reaction time in general. However, there were two significant 2-way interactions. First, there was a significant interaction between word type and avoidance ($F(1, 99) = 3.94, p < .05$) such that those high in attachment avoidance were slower at identifying

controlling words (combined with their matched neutral words) ($M = 1980$ ms) than were those low in attachment avoidance ($M = 1803$ ms) although no differences based on attachment avoidance were found in response times to proximity and disengagement words (with their respective matched neutrals) [M (proximity, high anxiety) = 1480 ms vs. M (proximity, low anxiety) = 1457 ms; M (disengagement, high anxiety) = 1465.75 ms vs. M (disengagement, low anxiety) = 1433.82 ms)]. There was also a significant interaction between target and avoidance ($F(1, 99) = 5.28, p < .05$) such that those high in attachment avoidance were faster to identify target words ($M = 1375$ ms) than were those low in attachment avoidance ($M = 1543$ ms) but attachment avoidance was unrelated to response time to neutral words [M (neutral, high anxiety) = 1754 ms vs. M (neutral, low anxiety) = 1741 ms)]. This pattern of results is inconsistent with my hypothesis that those high in attachment avoidance would demonstrate a facilitated performance with only disengagement themed words. Further, given that all three themes are somewhat relational in nature, one would expect that, if anything, they would be less accessible for those high in attachment avoidance.

Item analysis

To assess whether items were representative of the greater pool of potential words reflecting the themes of proximity, control, and disengagement, reaction time data were reconfigured and submitted to an item analysis. Differences in results between the item analysis and the analysis where the unit of analysis was the participant may suggest significant discrepancies in the pattern of results within words of a particular theme, suggesting that the words do not represent a unified theme and may not be representative of all possible words representing that theme.

To perform an item analysis, each word becomes a “subject” and participants become the “items” assessing the word. Because the words are subjects, the word type and whether the word is a target or a neutral word become between-subjects variables. That is, subjects belong to one of three word types (i.e., proximity, disengagement, control) and one of two target types (i.e., target, neutral). The type of induction (i.e., condition) becomes a within-subjects variable because each subject (i.e., word) has a response time from participants across all three conditions.

Items were subjected to a repeated measures ANOVA with one within-subjects variable [Condition: 3 (Own death, Mother’s death, Physical pain)] and two between-subjects variables [Word type: 3 (Proximity, Control, Disengagement) and Target: 2 (Target, Neutral)]. As in the subject analyses, the ANOVA revealed a significant main effect of Condition ($F(1, 53) = 6.12, p < .01$) such that participants were slower to identify words after thinking about their mother’s mortality than when they thought about their own mortality or their own physical pain. Again, there was also a significant main effect of Word Type ($F(1, 54) = 3.91, p < .05$) such that participants were faster at identifying proximity and disengagement words (and their respective matched neutrals) than they were at identifying controlling words (and their matched neutrals). The main effect of Target was marginally significant ($F(1, 54) = 2.65, p = .10$), again with participants being quicker at identifying target words as compared to neutral words.

Two significant interactions that were not found in the main analyses emerged from the item analysis ANOVA. The pattern of results was similar but not significant in the main analyses, therefore, the discrepant results are likely a result of greater power in the item analysis rather than an indication of non-representative stimuli. First, there was a significant two-way

interaction between condition and word type ($F(1, 108) = 2.51, p < .05$) such that controlling words (including matched neutrals) were more slowly identified after thinking about the mother's mortality than after thinking about one's own mortality or physical pain. Furthermore, controlling words were more slowly identified than proximity and disengagement words (including their respective matched neutral words) regardless of condition (Appendix E, Figure 6). There was also a significant three-way interaction (Condition X Word Type X Target; $F(1, 108) = 4.41, p < .01$) such that participants were slowest at identifying controlling words after thinking about their mother's mortality and slowest at identifying neutral words matched to control words after thinking about their mother's mortality or physical pain. Participants were fastest at identifying disengagement and proximity words in all conditions (Appendix E, Figures 7 & 8).

Study 2 Discussion

Study 2 served to examine implicit reactions to considering a parent's mortality. Specifically, I assessed participants' implicit responses to considering their mother's mortality in comparison with their responses when considering their own mortality or an experience of physical pain. In particular, I examined the extent to which themes of proximity, control, and disengagement were accessible after thinking about these events. Further, I considered the potential moderating roles of attachment anxiety and avoidance in these effects.

I predicted that the theme of proximity would be more cognitively accessible for those participants high in attachment anxiety and that the theme of disengagement would be more cognitively accessible for those high in attachment avoidance. Thus, I hypothesized two 3-way interactions between each attachment dimension and word type, such that across all conditions, those high in attachment anxiety would be faster at identifying proximity themed words in comparison with matched neutral words and those high in attachment avoidance would be faster at identifying disengagement themed words in comparison with matched neutral words. However, neither of these hypotheses received support in the current study.

I also predicted that there would be differences in the extent to which themes became cognitively accessible depending on which induction was completed prior to administration of the word completion task. That is, I predicted several 3- and 4-way interactions. My control condition, in which participants were asked to write about an experience of intense physical pain, should not induce thoughts and emotions relating to interpersonal themes and, I therefore predicted only baseline differences depending on attachment dimensions as described above. Specifically, those high in anxiety were expected to be faster at identifying proximity words than

matched neutral words and those high in avoidance were expected to be faster at identifying disengagement words than matched neutral words. This pattern, however, was not apparent either across conditions (as noted above) or specifically within the physical pain condition. Consequently, this hypothesis was not supported.

Based on previous research in the TMT literature, I further predicted that having participants consider their own mortality would increase the accessibility of the theme of proximity for all participants but more so for those high in attachment anxiety. Therefore, I hypothesized that participants who completed the word completion task after being asked to imagine and write about their own death would all identify proximity words faster than neutral words and that this pattern would be even stronger for those high in attachment anxiety. Again, however, the pattern of data did not support this hypothesis.

Finally, in the mother mortality salience condition, because the mother represents the source of anxiety, I predicted more complex patterns of cognitive activation based on attachment dimensions. Specifically, I predicted that those high in attachment anxiety would again demonstrate greater accessibility leading to faster reaction times to proximity words than to their matched neutral words. Further, in attempts to manage their anxiety while simultaneously thinking of proximity to their mother, I expected that the theme of control would become accessible. As such, I further predicted that those high in attachment anxiety would be quicker to identify controlling words than their matched neutral words. For those high in attachment avoidance, I expected that considering their mother's mortality would prompt thoughts relating to their desire to disengage. As such, in the mother mortality salience condition, I predicted that those high in attachment avoidance would demonstrate faster reaction times in identifying

disengagement words than their matched neutral words. The pattern of results did not support any of my predictions for the mother mortality salience condition.

Research has begun to recognize the reduction in reliability for implicit measures that often arises as a result of the relative flexibility in approaching the task compared with explicit measures (Buchner & Wippich, 2000). The reduction in power due to low reliability may help to explain the failure to find significant results in this study in line with predicted hypotheses and the results of study 1. Although some unpredicted significant associations did emerge, it is quite possible that they are not meaningful and are a result of familywise error. These findings are discussed briefly. First, participants responded more quickly and made fewer errors with target words than with their matched neutral words. This could suggest that the target word stimuli were, in some way, easier than the neutral word stimuli. However, when participants completed the same stimuli separately from the inductions during pilot testing, the stimuli were found to be comparably difficult. All three inductions share the commonality of presenting a threat of some kind to the participants and thus have the potential to activate attachment themes. Previous research in the field of attachment theory and Terror Management Theory (Mikulincer & Florian, 1998) has highlighted the tendency for attachment themes to become readily accessible under any type of threat. Indeed, the three themed sets of words are all emotionally evocative and relational in nature. Though no differences in the activation between these three themes emerged, it is possible that the general presentation of threat may have been sufficient to activate attachment themes.

Although the themes of proximity, control, and disengagement were not differentially activated depending on the induction, there was a significant main effect dependent on the

induction. Specifically, participants were significantly slower to identify all words after having written about their mother's death than either of the other two inductions. One possible explanation is that participants reacted more to this induction than to the other two, self-relevant conditions. Indeed, participants did rate the task of writing about their mother's death as significantly more upsetting than writing about their own death or physical pain ($F(1, 103) = 7.33, p < .01$) ($M = 5.58$ vs. 3.89 and 3.74 respectively). As such, participants in this condition may have been more distracted by their emotional response, resulting in poorer performance.

Participants also struggled more with controlling words (and their matched neutral words) than with proximity and disengagement words (and their matched neutrals), demonstrating significantly slower reaction times and more errors. This pattern, however, is consistent with the pattern of data in pilot testing in which participants were slower to identify controlling words and their matched neutral words than words in other categories. Therefore, this main effect likely represents a difference in the stimuli rather than an effect of the category membership of the word. Although target words were matched to neutral words on number of letters, number of syllables, and frequency of use, they were not matched across the three target word themes. Further, they could not be matched for all linguistic features including orthographic neighborhood.

In this study, I also found significant interactions between the type of words and participants' attachment avoidance. Specifically, those high in attachment avoidance were faster at identifying target words than those low in avoidance but did not differ on reaction times to neutral words. Further, those high in attachment avoidance were slower at identifying controlling words than those low in attachment avoidance, yet no differences were found in response time to

proximity and disengagement words depending on attachment avoidance. These results are not supported by theory and are opposite to the hypothesized pattern of results.

To assess the external validity of the word stimuli used in Study 2, I conducted an item analysis on the data. As in the main analysis, significant main effects with the same pattern of results were found based on the themes of words and the induction completed prior to the task. The significant main effect found in the main analysis based on whether words were target words or neutral words trended toward significance in the item analysis. Unlike the main analysis, there was a significant 2-way interaction between the type of word and the induction completed such that controlling words (and their matched neutrals) were more slowly identified after the mother mortality salience induction than either the self mortality salience induction or the physical pain induction. Further, there was a significant 3-way interaction between the type of word, whether the word was a target word or neutral, and the induction. Participants were slowest at identifying controlling words after writing about their mother's mortality and neutral words matched to control words after writing about their mother's mortality or an experience of physical pain. Further examination of the main analysis revealed the same pattern of differences in reaction times; however, the differences were not significant (Figures 6 and 8). Notably, the main analysis had less power than the item analysis and, as such, the different patterns of statistical significance are interpreted to be a result of differences in power rather than an indication that the stimuli used differ from the broader population of potential words represented by these themes.

Study 2 also aimed to replicate findings from Study 1 by asking participants to report on their behavioural tendencies toward their mother when they think of potential harm coming to

her such that she could die. Participants reported the extent to which they feel the desire to become vigilant for signs of illness, seek proximity to her, disengage from her, or become controlling of her. All of the significant associations with attachment anxiety and attachment avoidance found in Study 1 were also found in Study 2. That is, participants higher on either dimension of attachment insecurity reported lower desires to seek proximity to their mother when thinking about potential harm coming to her. Those high in avoidance were also less likely to report being vigilant for signs of illness in their mothers and to have a desire to assert control over her when thinking about potential harm coming to her. Not only do these results offer further support for the explicit behavioural responses of adult children based on attachment dimensions, they also suggest that participants are able to anticipate these responses prior to the emergence of a significant illness in their parents.

General Discussion

The purpose of these two studies was to explore the cognitive, emotional and behavioural responses of adults when confronted with thoughts of their parent's mortality. Study 1 considered this from an explicit point of view with a sample of adults that had a parent who was significantly ill; Study 2 used an implicit approach to assess the cognitive activation of themes of proximity, disengagement, and control, while simultaneously confirming the patterns of Study 1.

My first study provides an initial glimpse into the experiences of adults when their parent's mortality becomes salient due to illness or injury. The results from this study reflect the important role of the quality of the relationship between the parent and child. Specifically, those who report high levels of attachment insecurity, either of an anxious or avoidant nature, seek less proximity to their parent when their parent is ill as compared with those who experience greater security in their relationship with their parent. Furthermore, those who are more avoidant are even less engaged as they are less likely to become vigilant for signs of illness in their parents and less likely to want to assert control over their parent's health care behaviours than those low in avoidance. These findings for attachment avoidance are consistent with previous literature suggesting that these individuals, who perceive that others will not be available and supportive of them during times of need, refrain from seeking closeness in general and push away even further when attachment threats become salient. My findings for attachment anxiety, however, are opposite to my hypotheses and the basic conceptualization of attachment anxiety as a hyperactivation of attachment relationships (Mikulincer & Shaver, 2003).

To understand these findings, I return to the initial conceptualization of attachment anxiety, which focused on the ambivalent nature of these individuals (Ainsworth, Blehar,

Waters, & Wall, 1978). While those high in anxiety have an intense desire for closeness, they also fear the potential harm of rejection or abandonment that can come from seeking closeness to others. Recent research has further examined this push-and-pull nature and has found the tendency for those high in attachment anxiety to push away from closeness to be stronger when they consider the dissolution of a relationship (Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010). Given that the death of a parent embodies the ultimate dissolution of the relationship, it is understandable that those high in anxiety would push away from their attachment figures to protect themselves from the eventual loss.

Study 1 also identified other individual difference variables that are associated with adults disengaging from and becoming vigilant and controlling toward their ill parents. Adult children become more vigilant for signs of illness in their parents and more controlling of them when they perceive their parent's illness to be more severe and when they feel their parent is taking poorer care of his or her own health. When parents are more severely ill and/or do not adequately care for their health (e.g., smoking heavily, infrequent doctor's visits), the threat of their mortality is likely to be greater and may engender a sense that the child must take over in providing care of the parent. Older children and those who have older parents reported lower desires to want to disengage from their ill parents, whereas those who are younger reported stronger desires to suppress their thoughts and feelings about their parents' illness and to avoid having contact with them. While there is little research to shed light on this finding, one study found that people tend to become more accepting of their eventual mortality in their older years (Gill, 2008). This acceptance may extend to the child through conversation with the parent and the realization that the parent has lived a long life.

Finally, participants who serve a caregiver role for one of their parents reported stronger tendencies to want to disengage from their parents than did those who do not serve a caregiver role. Further, those who reported that their caregiving duties consumed a great deal of their physical and emotional energy were more likely to want to disengage from their parents. This suggests that caregivers become overwhelmed to the point that they begin to withdraw from their thoughts and feelings toward their parent's mortality and perhaps consequently to their parent as well. This highlights the strong need for support for adult child caregivers.

Implications

The behavioural responses outlined above are not only relevant for the adult child, but potentially have important implications for the health and well-being of the parent. Greater proximity of children when a parent's health is compromised may help the parent to be supported physically and emotionally. Further, it provides greater opportunity for parent and child to adjust to the changes in their relationship, for the child to come to terms with the eventual loss of the parent, and for the parent to be reminded of their ongoing contribution to society (i.e., offspring), which has been demonstrated to buffer the anxiety of death (Greenberg, Solomon, & Pyszczynski, 1997). Not seeking proximity, or even actively disengaging from a parent at this critical point in time, leaves the possibility open for the parent's physical and emotional needs to be unmet. Older adults in poor health often become less capable of taking care of their increasingly complex physical needs. Often it is the spouse that takes on the caregiver role, however, if there is no spouse or the spouse is also not capable of caring for these needs, then the responsibility may fall on the adult child (Funk, Stajduhar, Toyé, Aoun, Grande, & Todd, 2010; Stajduhar, Funk, Toyé, Grande, Aoun, & Todd, 2010). In terms of emotional

needs, research has found that withdrawal and avoidant responses from loved ones are associated with more avoidant coping, greater psychological distress, and poorer psychological well-being among cancer patients (Manne, Ostroff, Winkel, Grana, & Fox, 2005; Manne, Taylor, Dougherty, & Kenny, 1997). Essentially, disengagement on the part of adult children poses the risk of the physical or emotional needs of older adults being unmet, which may decrease the quality and/or duration of their remaining life.

While controlling behaviours may be the product of an adult child's attempt to protect an ill parent, they too have the potential to compromise a parent's emotional and physical well-being. Specifically, feeling controlled is likely to undermine the parent's sense of personal choice and control as well as their self-efficacy or competence (Deci & Ryan, 2000; Ryan, Patrick, Deci, & Williams, 2008). Research has found that greater perceptions of autonomy (i.e., volition and choice, as opposed to control) and competence predict positive health behaviours, such as smoking cessation (Williams et al., 2006b) and greater glycemic control among diabetics (Williams et al., 2004). Finally, greater self-efficacy among congestive heart failure patients has been associated with greater survival over the course of four years (Rorhbaugh, Shoham, Coyne, Cranford, Sonnega, & Nicklas, 2004). Thus, controlling behaviours on the part of adult children run the risk of having adverse effects on their parent's emotional and physical well-being.

My second study considered the implicit reactions of adults when asked to think about their mother's potential death as compared with reactions to thinking about their own death or an experience of physical pain. Results from this study did not support my hypotheses that those high in attachment anxiety would generally demonstrate greater cognitive accessibility (i.e., faster reaction times) to themes of proximity than those low in anxiety or that those high in

attachment avoidance would generally demonstrate greater cognitive accessibility (i.e., faster reaction times) to disengagement words than those low in attachment avoidance. Further, my hypotheses that these differences would be greater after participants wrote about their own or their mother's death and that those high in attachment anxiety would also respond more quickly to controlling words than those low in attachment anxiety after writing about their mother's death also were not supported.

Study 2 did, however, produce some interesting findings. In particular, although themed words (i.e., proximity, disengagement, control) were found to be equally challenging to matched neutral words during pilot testing, they were identified more quickly and with fewer errors following all inductions. Notably, all three themes have relational salience and all three inductions presented participants with some sort of threat. Attachment themes have generally been found to become more prominent when an individual is threatened, suggesting that my inductions were all sufficient to instill a sense of threat, even if I was unable to detect differences in emotional responses. While the pattern of reaction times was similar across conditions, I did find that participants generally responded more slowly to all words after writing about their mother's death than after writing about their own death or an experience of physical pain. Notably, participants were asked at the end of the study how upsetting they found the written task and these ratings were higher for participants asked to write about their mother's death than for participants in the other two conditions. As such, one explanation for slower reaction times in this condition may be that participants were not yet disengaged from the written task to focus their attention fully on the word completion task. This could suggest that participants who may not have been previously confronted with their mother's mortality may be more upset by thinking about this topic than by considering their own death.

Limitations

There are a number of potential limitations that may have prevented me from detecting the predicted effects in Study 2. First, only a small number of theme-representative words could be found, resulting in only ten observations for each theme. Indeed, even among the words that were used, there were words that did not represent the theme as well as others and perhaps only a few words from each theme adequately represented the constructs of interest. Given that the participants in study 2 did not currently have an ill parent (as was the case in study 1), it is also possible that the words themselves were too far removed from the realities of experienced emotion amongst those who are directly confronted with their parent's mortality. The indirect methods used in this study may not allow a nuanced examination of this complex emotional experience.

Second, the word completion task itself is prone to significant variability in response times as people's ability to identify words when letters are missing varies considerably. As such, considerable error variance may have made it impossible to identify any systematic variance in the reaction time data. Research has begun to identify the tendency for implicit measures to have much lower reliability than explicit measures as a function of the considerable latitude present in how to complete implicit tasks (Buchner & Wippich, 2000). Whereas explicit tasks generally have a well-specified performance goal with limited options, implicit tasks tend to be less rigidly defined and often leave more room for different responses and means of generating responses. It is possible that the reliability of the word-completion task was not great enough to identify predicted differences.

The age of participants used in this study may also have presented a challenge in finding effects. The majority of participants were in their late teens and early twenties and completed the study to obtain credit toward a psychology course. Participants in this age range may not have previously given serious thought to their parents' mortality and may not have been fully engaged in the task, having no sense that it was relevant to them. Finally, while the trend of responses in the data was not consistent with my hypotheses, power may have still been an issue in identifying key differences. The study is a between-subjects design and my main hypotheses involved a 4-way interaction, both of which contribute to the requirement of a large number of participants to identify significant differences.

There were also potential limitations to the explicit study of behavioural responses in Study 1. By their nature, self-report measures allow participants to present themselves in a socially desirable manner. In the current study, participants may have been reluctant to indicate tendencies to disengage or become controlling of their parents as these behaviours may have been seen in a negative light. Indeed the mean rating of disengaging behaviours was relatively low within the scale range. Further, the defensive nature of attachment avoidance and the tendency for those high in avoidance not to acknowledge distress is likely to influence the manner in which they respond to self-report questionnaires. In attempts to make up for this potential limitation, I used an implicit design in Study 2 as these types of methodology are less susceptible to reporting biases.

Although the purpose of the current research was to obtain a better understanding of the experience of adults when they are confronted by a parent's mortality, the adults themselves may not be the most objective assessors of their own behaviours. For instance, a parent who is the

recipient of controlling behaviours is more likely to experience and identify these behaviours as controlling than is the participant who is engaging in them. Furthermore, attachment is a bidirectional construct. Given the interplay between the parent and the child, it would be informative to assess the parent's views of the attachment relationship. Another potential limitation of this study was the inclusion of participants whose parents' illnesses were low in severity. The average severity rating across participants fell in the upper half of the scale range. However, the parent's mortality may not become salient unless the illness is definitely life threatening. Although for some participants in this study their parent's illness was life threatening, the number of participants endorsing the upper end of the severity scale was not sufficient to conduct separate analyses.

Conclusions and Future Directions

The current research provides a preliminary exploration into the experiences of adult children for whom a parent's mortality has become salient. Previous research has considered the emotional responses of children and adult children following the death of a parent but research examining the process leading up to a parent's death has been confined to the caregiver literature and issues relating to caregiver burden. As such, Study 1 offers an initial glimpse into this developmental process and provides a good foundation for future research.

Future studies should include, in addition to the adult child's ratings, ratings from the ill parent of the adult child's behaviours. As noted, self-report measures can be biased to present the self in a more positive light. In the current studies, participants may not have been willing or able to admit that they have disengaged or become controlling of an ill parent. Further, they may not be aware of how their behaviours are experienced by their parents. It is quite likely that the

recipient of these behaviours (i.e., the parent) will offer a different perspective on what is happening within the relationship. While the parent's ratings may also not be completely objective, it is important to obtain their point of view given our interest in understanding how the adult child's behaviours (or the parent's perceptions of the adult child's behaviours) influence the parent's well-being. Further, obtaining behavioural ratings from the parent allows us to obtain a more nuanced understanding of the interplay between the parent and adult child's behaviours in what is ultimately a relational and dyadic event.

In future studies, we may also want to consider the experiences only of participants whose parents' illnesses are potentially terminal in order to ensure that the parent's mortality has become a central concern. Furthermore, obtaining ratings from both the parent and adult child as soon as possible after the parent's illness begins would be useful in obtaining a better understanding of the initial reaction of being confronted with the parent's mortality before there is a chance for participants to habituate to these thoughts. In the current study, the parent's illness had begun recently (i.e., within the past year), however, this still left time for adjustment to the situation and did not allow us to capture initial reactions to confronting a parent's mortality.

The current study focused on the influence of the quality of the attachment relationship on being confronted by a parent's mortality; however, there are many other factors that have the potential to influence this experience. Future research should consider the role of other variables including, but not limited to, the support system available to the adult child and other attachment figures who may be able to provide support and comfort, the presence of other family members, including siblings and the other parent, and the child's remembered history of the care provided by their parent during childhood illnesses. Other individual differences that may come into play

include cultural differences, personality differences (e.g., conscientiousness, neuroticism, compassion), and coping mechanisms such as experiential avoidance.

Finally, future longitudinal studies should explore how the manner in which an adult child approaches the prospect of their parents' death affects the manner in which they cope following the death of their parent. With respect to the behaviours studied in the current study, one might imagine, for example, that after a parent dies those who disengage may experience regrets about not spending more time with their parent.

This line of research has important implications for the emotional well-being of both parents and children as well as the quality of the parent-child relationship. A parent's deteriorating health and the threat of mortality have the potential to alter significantly the nature of this relationship and the manner in which parent and child interact. The way in which both parent and child cope with their emotions and act toward each other is likely to affect the quality of their relationship significantly during its last years. Not only is this pertinent to the emotional well-being of parent and child, it also has important implications for the physical health of the parent. While greater proximity seeking on the part of children will increase the chances that a parent's physical needs are taken care of, not seeking proximity or even disengaging from parents threatens to neglect these needs. Adult children who become controlling of their ill parents in attempts to protect them from harm and to prevent future illness may inadvertently undermine their parents' sense of autonomy and self-efficacy, both of which have proven to be important for promoting the parent's health and engagement in health-promoting behaviours.

As adult children frequently become caregivers to their aging parents, their emotional preparedness and the manner in which their responses influence the way in which they interact

with their parent will likely affect whether they are able and willing to provide care for their parents and the overall quality of care that is provided. For those who are willing to take on a caregiver role, they may need a great deal of support while providing care for their parents, suggesting the need for future research on how best to do this.

In sum, the current research provides an introduction into the study of how adult children cope with thoughts of their parent's mortality. This research has relevance for a large proportion of the population as increasing numbers of parents are living well into their children's adulthood. Future research in this area is required to further understand the complexities of this development.

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Appendix A

Study 1 Materials

Bartholomew & Horowitz (1991) Relationship Questionnaire

Please rate each of the following relationship styles according to the extent to which you think each description corresponds to your relationship with your mother.

It is easy for me to become emotionally close to my mother. I am comfortable depending on her and having her depend on me. I don't worry about being alone or having my mother not accept me.

Not at all like me		Somewhat like me			Very much like me	
1	2	3	4	5	6	7

I am uncomfortable getting close to my mother. I want an emotionally close relationship with her, but I find it difficult to trust her completely, or to depend on her. I worry that I will be hurt if I allow myself to become too close to her.

Not at all like me		Somewhat like me			Very much like me	
1	2	3	4	5	6	7

I want to be completely emotionally intimate with my mother, but I often find that she is reluctant to get as close as I would like. I am uncomfortable being without a close relationship with my mother, but I sometimes worry that she doesn't value me as much as I value her.

Not at all like me		Somewhat like me			Very much like me	
1	2	3	4	5	6	7

I am comfortable without a close emotional relationship with my mother, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on her or have her depend on me.

Not at all like me		Somewhat like me			Very much like me	
1	2	3	4	5	6	7

Please rate each of the following relationship styles according to the extent to which you think each description corresponds to your relationship with your father.

It is easy for me to become emotionally close to my father. I am comfortable depending on him and having him depend on me. I don't worry about being alone or having my father not accept me.

Not at all like me		Somewhat like me			Very much like me	
1	2	3	4	5	6	7

I am uncomfortable getting close to my father. I want an emotionally close relationship with him, but I find it difficult to trust him completely, or to depend on him. I worry that I will be hurt if I allow myself to become too close to him.

Not at all like me		Somewhat like me			Very much like me	
1	2	3	4	5	6	7

I want to be completely emotionally intimate with my father, but I often find that he is reluctant to get as close as I would like. I am uncomfortable being without a close relationship with my father, but I sometimes worry that he doesn't value me as much as I value him.

Not at all like me		Somewhat like me			Very much like me	
1	2	3	4	5	6	7

I am comfortable without a close emotional relationship with my father, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on him or have him depend on me.

Not at all like me		Somewhat like me			Very much like me	
1	2	3	4	5	6	7

Parental Mortality Salience Scale

Not at all true

Somewhat true

Very true

1

2

3

4

5

6

7

When I think about possible harm coming to my father/mother such that he/she could die....

- It makes me want to get in touch with him/her (e.g., call or go see him/her).
- It makes me want to do things to have a closer relationship with him/her (e.g., talk more openly with him/her about things important to me; make an effort to spend more time with him/her).
- It makes me want to be more affectionate with him/her (e.g., hug).
- It gets me too distressed so it makes me want to suppress my feelings or distract myself from them.
- It makes me upset so I try to limit myself from thinking about it.
- It is painful and makes me want to avoid thinking about him/her at all.
- It is painful and makes me want to avoid any contact with him/her.
- It makes me want to limit him/her from doing anything that might make him/her more vulnerable to harm (e.g., I would do housework/yardwork so he/she isn't overexerting himself/herself).
- It makes me want to be overprotective of him/her [e.g., tell him/her to take more precautions (e.g., go to the doctor, not be alone just in case he/she needs help)
- It makes me want to tell him/her to change his/her lifestyle (e.g., stop drinking, smoking) in order to be healthier.

When I think about possible harm coming to my father/mother such that he/she could die...

- I am on alert
- I feel vigilant
- I feel watchful
- I feel wary
- I feel cautious
- I feel hypervigilant

Royal Free Interview of Spiritual and Religious Beliefs

We are going to ask you some questions about religious and spiritual beliefs. Please try to answer them even if you have little interest in religion.

In using the word religion, we mean the actual practice of a faith, e.g. going to a temple, mosque, church or synagogue. Some people do not follow a specific religion but do have spiritual beliefs or experiences. For example, they may believe that there is some power or force other than themselves that might influence their life. Some people think of this as God or gods, others do not. Some people make sense of their lives without any religious or spiritual belief.

1. Therefore, would you say that you have a religious or spiritual understanding of your life? (please check one)
-Religious
-Spiritual
-Religious and spiritual
-Neither religious nor spiritual

2. Some people hold strongly to their views and others do not. How strongly do you hold to your religious/spiritual view of life? Circle the number that best describes your view.

Weakly held view Strongly held view

0 1 2 3 4 5 6 7 8 9 10

3. How important to you is the practice of your belief (e.g. private meditation, religious services, prayer, etc..) in your day-to-day life? Please circle the number on the scale which best describes your view.

Not necessary Essential

0 1 2 3 4 5 6 7 8 9 10

4. Do you believe in a spiritual power or force other than yourself that can *influence* what happens to you in our day-to-day life? Please circle the number on the scale which best describes your view.

No influence Strong influence

0 1 2 3 4 5 6 7 8 9 10

5. Do you believe in a spiritual power or force other than yourself that enables you to *cope* personally with events in your life? Please circle the number on the scale which best describes your view.

No influence Strong influence

0 1 2 3 4 5 6 7 8 9 10

6. To what extent do you communicate in any way with a spiritual power, for example by prayer or contact via a medium?

Never					Daily				Several times daily
0	1	2	3	4	5	6	7	8	9 10

7. To what extent do you believe we exist in some form after our death?

Not at all					Not sure			Strong belief
0	1	2	3	4	5	6	7	8 9 10

Parent Health Questionnaire

1. Does your [mother/father] have a major illness or health problem? If yes: How severe is this illness or health problem?

Few Effects

Moderate

Terminal

1

2

3

4

5

6

7

2. How often does your [mother/father] smoke cigarettes?

Never

Sometimes

Regularly

A pack a day

More than a pack a day

3. How often does your [mother/father] consume more than one alcoholic beverage?

Never

Every now and then

Once or twice a week

Several times a week

Daily

4. How often does your [mother/father] exercise?

Never

Sometimes

Once a week

A few times a week

Daily

5. How healthy is your [mother/father]'s diet?

Very Unhealthy

Somewhat unhealthy

Moderate

Somewhat healthy

Very healthy

6. How well does your [mother/father] generally care for his or her own health?

- Very Poorly
- Somewhat Poorly
- Moderate
- Well
- Very Well

7. Does your [mother/father] visit a doctor when there is something wrong with him or her?

- Never
- Sometimes
- Usually
- Even when there is nothing wrong

Caretaking Role Questionnaire

1. Do you currently fill a caregiver role for either of your parents?

- My mother
- My father
- Both parents
- Neither parent

2. If yes, to what extent do feel that this role uses up your **emotional energy**?

Not at all			Somewhat			A lot
1	2	3	4	5	6	7

3. If yes, to what extent do feel that this role uses up your **physical energy**?

Not at all			Somewhat			A lot
1	2	3	4	5	6	7

Appendix B

Study 1 Tables

Table 1

Sample size (N), Means, and Standard Deviations (SD) of study variables.

	<i>N</i>	<i>Mean</i>	<i>SD</i>
Participant age	110	39.73	10.13
Age of parent	110	68.71	10.83
Severity of parent's illness	110	3.19	1.01
Vigilance	110	4.54	1.56
Proximity seeking	110	5.55	1.47
Disengagement	110	2.99	1.41
Overcontrol	110	4.78	1.79
Attachment security	110	6.10	9.19
Anxious attachment	110	-2.32	4.20
Avoidant attachment	110	-1.90	4.34
Participant strength of spirituality	81	4.28	1.34
Parent's health-related behaviours	110	3.62	.69
Caregiver burden	29	5.34	1.22

Note: See Method section pp. 24-27 for relevant scale range and anchors

Table 2

Relations of participant's age (N=109), parent's age, illness severity, parent's health-related behaviours (N=110), participant's strength of spiritual beliefs (N=81), and caregiver burden (N=29) with vigilance, proximity-seeking, disengagement, and control.

	<i>Vigilance</i>	<i>Proximity Seeking</i>	<i>Disengaging Behaviours</i>	<i>Controlling Behaviours</i>
Participant age	.07	-.08	-.19*	-.13
Age of parent	-.04	-.09	-.24*	-.18†
Severity of parent's illness	.18†	.10	.04	.24*
Parent's health behaviours	-.23*	.13	-.13	-.27**
Participant's spirituality	.03	.16	-.13	.03
Participant's caregiver burden	.40**	.26	.23	.13

$p < .01$ **

$p < .05$ *

Marginally significant †

Table 3

Relations of attachment anxiety, and avoidance with vigilance, proximity-seeking, disengagement, and control in Studies 1 and 2.

Study 1

	<i>Vigilance</i>	<i>Proximity Seeking</i>	<i>Disengaging Behaviours</i>	<i>Controlling Behaviours</i>
Anxious attachment	.05	-.25**	.16	-.12
Avoidant attachment	-.28**	-.48***	.10	-.23*

Study 2 Replication

	<i>Vigilance</i>	<i>Proximity Seeking</i>	<i>Disengaging Behaviours</i>	<i>Controlling Behaviours</i>
Anxious attachment	-.005	-.28*	-.06	-.13
Avoidant attachment	-.26*	-.42***	.02	-.31**

$p < .001$ ***

$p < .01$ **

$p < .05$ *

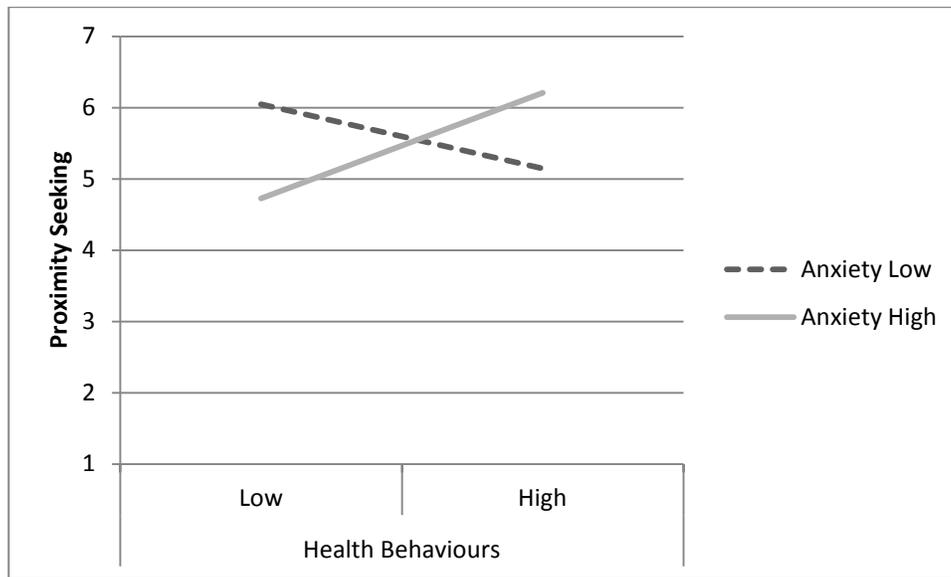
Marginally significant †

Appendix C

Study 1 Figures

Figure 1

Significant 2-way interaction between participants' attachment anxiety and the quality of parent's health-related behaviours when predicting proximity seeking.



Note:

Anxiety Low = One standard deviation below the mean on attachment anxiety

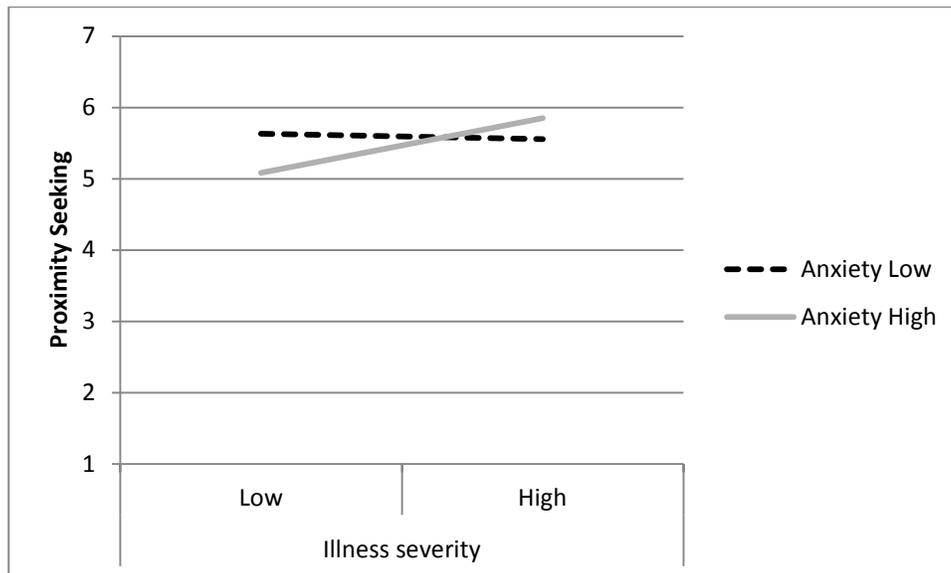
Anxiety High = One standard deviation above the mean on attachment anxiety

Health Behaviours Low = One standard deviation below the mean on a scale assessing positive health behaviours

Health Behaviours High = One standard deviation above the mean on a scale assessing positive health behaviours

Figure 2

Marginally significant 2-way interaction between participants' attachment anxiety and parents' illness severity when predicting proximity seeking ($p = .06$).



Note:

Anxiety Low = One standard deviation below the mean on attachment anxiety

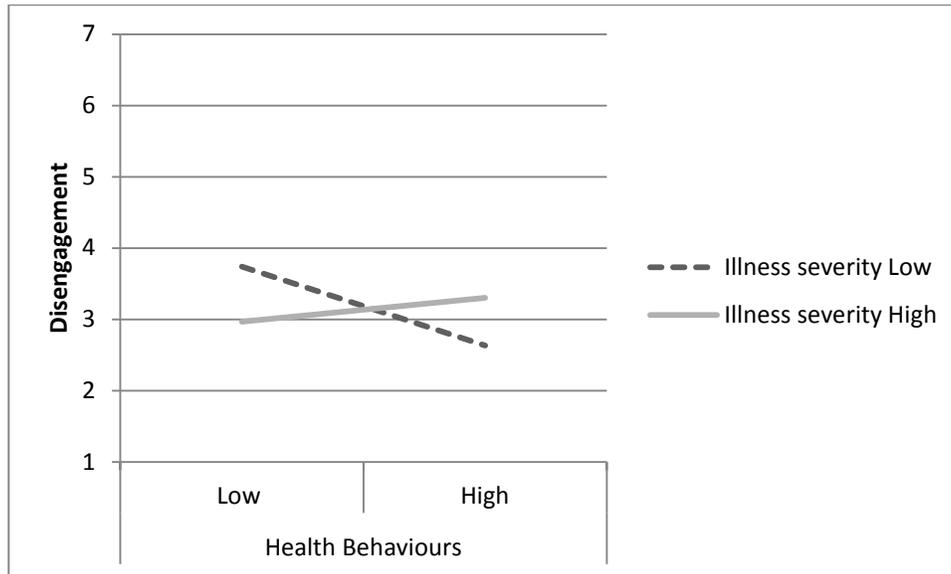
Anxiety High = One standard deviation above the mean on attachment anxiety

Illness Severity Low = One standard deviation below the mean on a scale of illness severity

Illness Severity High = One standard deviation above the mean on a scale of illness severity

Figure 3

Significant 2-way interaction between parent's health-related behaviours and the severity of their illness when predicting participants' disengagement.



Note:

Health Behaviours Low = One standard deviation below the mean on a scale assessing positive health behaviours

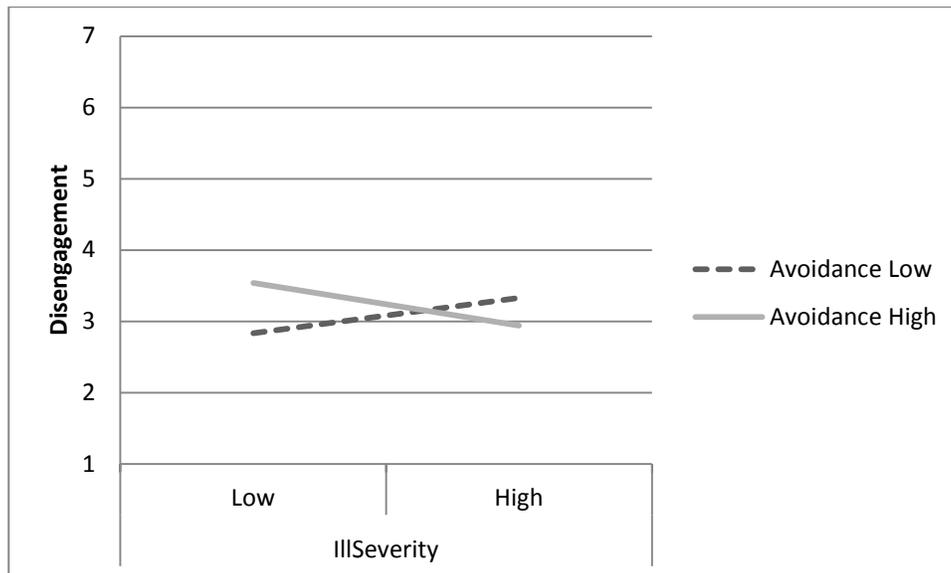
Health Behaviours High = One standard deviation above the mean on a scale assessing positive health behaviours

Illness Severity Low = One standard deviation below the mean on a scale of illness severity

Illness Severity High = One standard deviation above the mean on a scale of illness severity

Figure 4

Marginally significant 2-way interaction between participants' attachment avoidance and parent's illness severity when predicting the participants' disengagement.



Note:

Avoidance Low = One standard deviation below the mean on attachment avoidance

Avoidance High = One standard deviation above the mean on attachment avoidance

Illness Severity Low = One standard deviation below the mean on a scale of illness severity

Illness Severity High = One standard deviation above the mean on a scale of illness severity

Appendix D

Materials for Study 2 with mean reaction times and Kucera-Francis (1967) word frequency

<i>Target word</i>	<i>Stimuli</i>	<i>KF</i>	<i>RT (ms)</i>	<i>Matched word</i>	<i>Stimuli</i>	<i>KF</i>	<i>RT (ms)</i>
Proximity				Neutral			
Proximity	pr_x_mit_	5	1800.63	Geography	ge_g_aph_	5	1744.71
Connect	c_nnec_	3	1756.64	Gateway	g_tewa_	3	1793.71
Attach	_ttach	14	1446.16	Custom	_ustom	14	1533.10
Connection	co_nec_ion	69	1732.34	Completion	co_ple_ion	57	1668.86
Join	j_in	65	1320.03	Grew	g_ew	64	1361.13
Touch	t_uch	87	1202.08	Build	b_ild	86	1358.43
Together	t_g_th_r	267	1336.45	Anything	a_y_hi_g	280	1382.07
Approach	_pp_oa_h	123	1308.16	Somewhat	_om_wh_t	127	1347.71
Contact	con_a_t	63	1980.35	Explain	exp_a_n	64	1810.56
Closeness	c_ose_es_	1	2211.03	Fortnight	f_rtn_gh_	1	2475.17
<i>Mean RT</i>			1609.39	<i>Mean RT</i>			1647.55
Control				Neutral			
Over-protective	o_r- p_ot_c_ive	1	2313.36	Elec- tronically	e_-- ct_on_c_lly	1	2686.31
Over-bearing	ov_- be_ri_g	2	2006.33	Over- hanging	ov_- ha_gi_g	2	2139.47
Restrict	res_ri_t	11	2056.50	Mainland	mai_la_d	11	2102.13
Prohibit	pro_ib_t	2	1757.76	Regulate	reg_la_e	2	2095.89
Limit	l_mit	48	1105.89	Reply	r_ply	42	1140.66
Control	co_tr_l	223	1300.90	Outside	ou_si_e	210	1350.93
Forbid	forb_d	4	1517.96	Inland	inl_nd	4	1500.33
Demand	d_man_	102	2008.83	Supply	s_ppl_	102	1642.36
Dominate	do_ina_e	8	2078.04	Umbrella	um_rel_a	8	2017.60
Dictate	di_ta_e	3	2850.72	Crooked	cr_ok_d	3	2827.30
<i>Mean RT</i>			1899.63	<i>Mean RT</i>			1950.29
Disengagement				Neutral			
Avoid	_void	58	1563.26	Minor	_inor	58	1610.03
Escape	e_c_pe	65	1445.77	Object	o_j_ct	65	1296.87
Distance	dis_anc_	108	1715.61	Standard	sta_dar_	110	1795.84
Away	a_ay	456	1913.39	Upon	u_on	495	1585.46
Isolate	iso_at_	8	1490.00	Testify	tes_if_	8	1480.00
Hide	h_de	22	1120.60	Joke	j_ke	22	996.32
Ignore	ig_or_	19	1512.56	Arrest	ar_es_	19	1528.03
Evade	ev_d_	1	1985.79	Erase	er_s_	1	1933.39
Withdraw	wit_dr_w	8	1820.67	Wardrobe	war_ro_e	8	1945.57
Retreat	r_t_eat	14	1410.93	Approve	a_p_ove	14	1253.90
<i>Mean RT</i>			1597.86	<i>Mean RT</i>			1542.53

Appendix E

Study 2 Figures

Figure 5

Effect of word type by target interaction on number of errors in word completion task

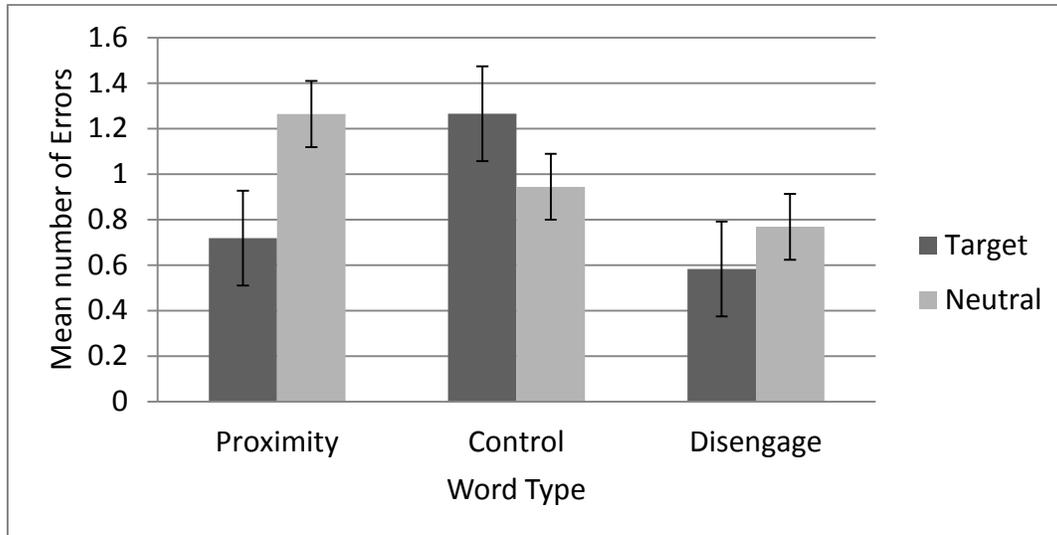


Figure 6

Effect of word type by condition interaction on reaction time in item analysis ($p < .05$) and main analysis ($n.s.$)

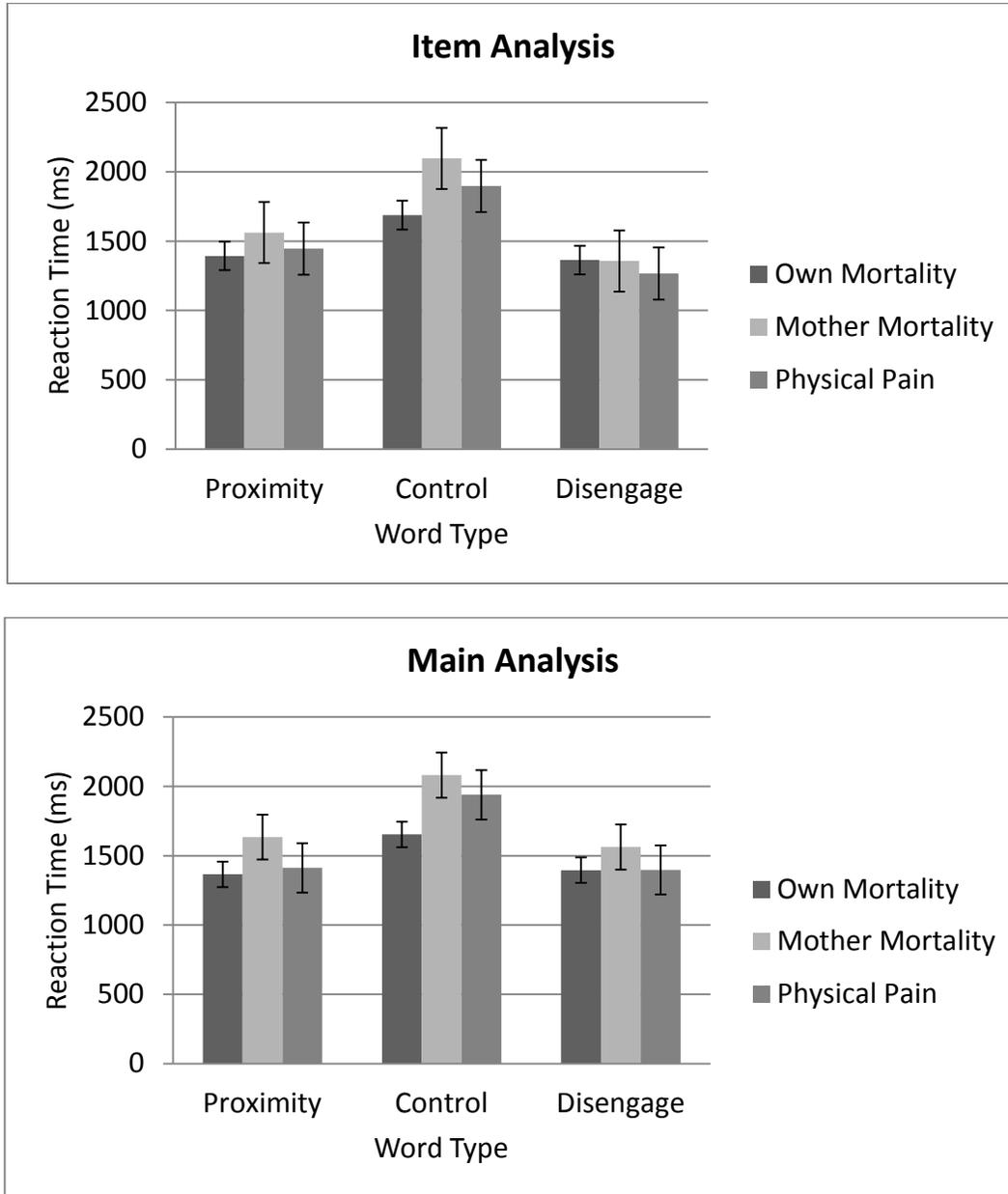


Figure 7

Effect of word type by target by condition interaction on reaction time in item analysis ($p < .01$)

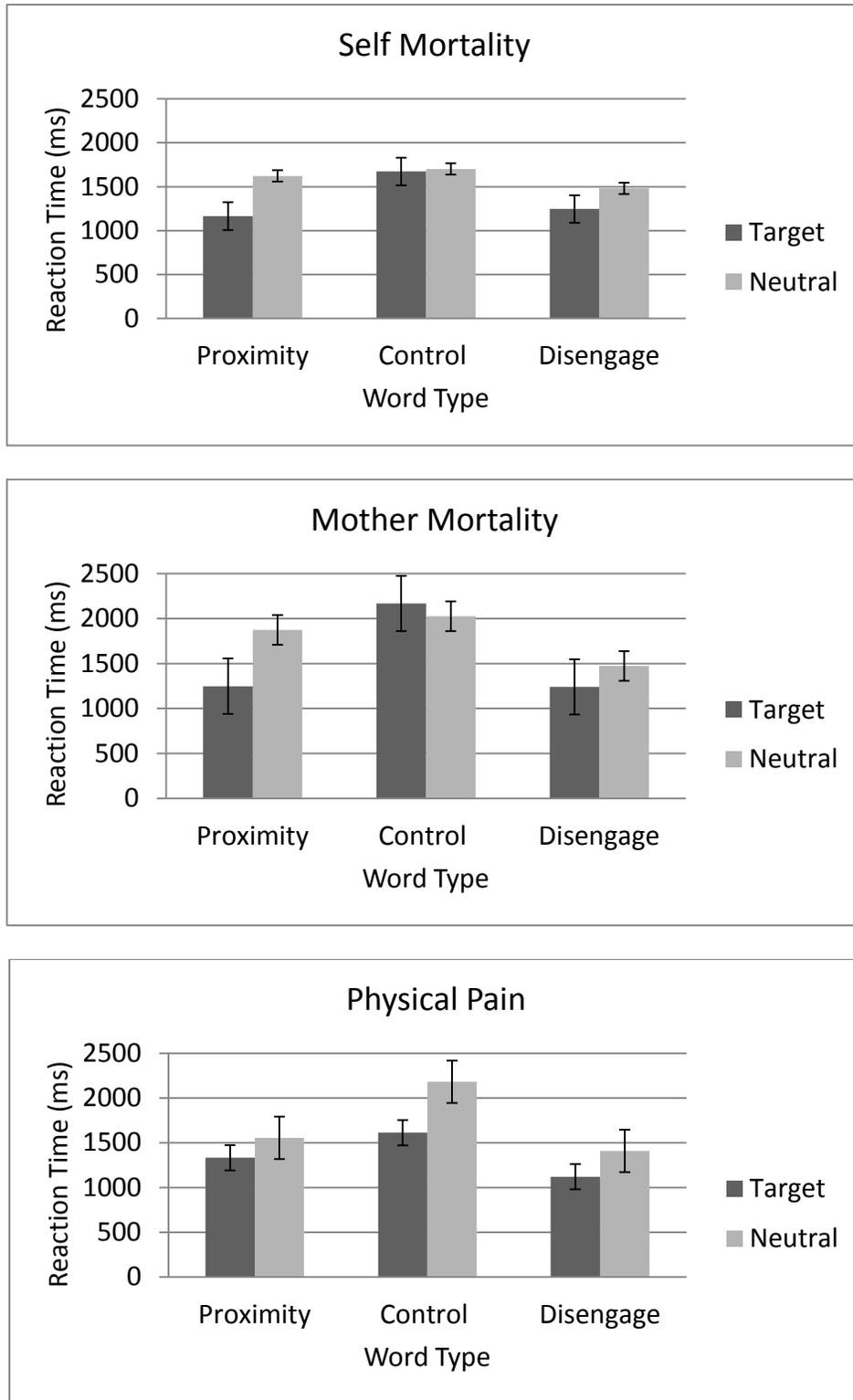


Figure 8

Effect of word type by target by condition interaction on reaction time in main analysis (*n.s.*)

