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THE EFFECT OF THE DEATH OF A CHILD ON MIDLIFE MENTAL AND  
PHYSICAL HEALTH: AN EXPLORATION OF RISK AND RESILIENCE  
FACTORS

by

CATHERINE HILARY ROGERS

Under the Direction of Frank J. Floyd, Ph.D.

ABSTRACT

The study examined the long-term effects of a death of a child on a variety of parental psychological and physical outcomes, incorporating several methodological and conceptual innovations over previous research. Prior bereavement research typically has focused on functioning within a short time period after the death and often has utilized self-selected samples of grieving parents; thus current models of grief may be inadequate. In contrast, this study broadened the timeframe in which bereavement is studied (average time since death= 20 years), and examined a sample of bereaved parents who were not self-selected. Participants were members of the Wisconsin Longitudinal Study (713 bereaved and 713 non-bereaved parents) who were assessed in 1957, 1975/77, and 1992/94 and were matched on family of origin demographic variables. Results show that bereaved parents reported a higher sense of purpose in life than non-bereaved parents. Further, higher levels of purpose in life was associated with lower levels of depression in bereaved parents, and with lower levels of physical illness in bereaved men. As expected, bereaved parents exhibited higher levels of depression than non-

bereaved parents. For bereaved women, having someone with whom to share private thoughts and feelings was correlated with higher levels of depression, indicating that social support may be sought when functioning is poor. Higher job satisfaction was associated with lower levels of depression in bereaved women suggesting that role variegation is a factor promoting resiliency. Further, having another child after the death of a child was associated with lower levels of depression for bereaved women. Contrary to expectations, having other children in the home at the time of death was associated with lower social support and higher divorce rates for bereaved women. In sum, the current study suggests that the negative effects of the death of a child are longstanding. Several factors (e.g., purpose in life, role variegation) may promote resiliency and thus merit more scientific study and clinical attention.

INDEX WORDS: Bereavement, Death of a Child, Coping, Resilience

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A Dissertation Submitted in Partial Fulfillment of Requirements for the Degree of

Doctor of Philosophy

Georgia State University

2005

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Catherine Hilary Rogers

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## Chapter 1

### Introduction

Every year, roughly 80,000 parents are bereaved by the deaths of their children due to accidents, suicide, and homicide (U.S. National Center for Health Statistics, 2000). This number is even greater when one considers the loss of children to illness. The loss of a child is irrefutably one of the most tragic and agonizing events that an adult may experience. The death of a child has been referred to as the most painful and intense loss possible (Nelson and Frantz, 1996) and has been noted as one of the losses most likely to lead to complicated grief (Rando, 1993). Many parents consider the bond between child and parent to be sacred and thereby irreplaceable (Klass & Mawit, 1989). The death of a child is an uncontrollable event, but parents often feel as though they should have been able to protect their child better (Gilbert, 1997). The occurrence of the death of a child defies the perceived natural order of life events, as parents expect their children to outlive them. This experience shakes the very foundations of parents' ideologies and basic assumptions about life. It changes the parent in fundamental ways. For example, although the experience may foster a period of personal growth, more typically it serves to alienate the individual from the external world. In fact, many parents subjectively describe the event as devastatingly life-altering. Modern novelist Arundhati Roy commented on the longevity and intensity of the grief that stems from the loss of a child in the following statement: "It is curious how sometimes the memory of death lives on for so much longer than the memory of the life that it purloined." As will be discussed below, there is reason to believe that the impacts might be life-long for parents.

Although previous researchers have examined short-term outcomes of parental bereavement, few studies explore the long-term effects of the death of a child on parental mental and physical health. Additionally, it has been suggested that traditional models of grief resolution may not adequately capture the experience over an extended period of time (Murphy, et al., 2002). In fact, these models suggest that grief resolution should occur temporally faster than it actually does. Thus it is worthwhile to explore long-term outcomes in parents who have lost a child, as prior research may have missed important long-term effects.

There appears to be a general experience in which bereavement, particularly one's emotional response to the loss, causes negative psychological outcomes. Newly bereaved parents exhibit more depression, somatic symptoms, poorer self-esteem, and a lower sense of control in their life compared to nonbereaved parents (Videka-Sherman & Lieberman, 1985). Nonetheless, not all parents continue to experience these negative symptoms over an extended period of time, though some clearly do (McClowry et al., 1995). Therefore, it is vital to examine differences between those parents who eventually exhibit good mental and physical health and those who do not in order to advance an understanding of factors that either promote or hinder effective coping and grief resolution over time.

Traditionally, bereavement has been conceptualized as a normative life event and therefore is not included as a diagnostic category in the DSM-IV, although it is listed as a "V code" meriting "focus for clinical attention" (APA, 1994). More recently, "non-normative" bereavement has been likened to a trauma because of the overlapping defining features of non-normative bereavement and posttraumatic stress disorder (PTSD), which occurs after trauma exposure in some people. For example, bereaved individuals may experience hallucinatory experiences in which the individual believes that he/she sees or hears the deceased person, may

be preoccupied with thoughts of death, and may have marked functional impairment (APA, 1994). Similarly, hallucinatory experiences associated with the trauma, thoughts of death, and marked functional impairment are also symptoms of PTSD.

Several considerations suggest that it is reasonable to conceptualize prolonged poor mental and physical health outcomes after the death of a child within a PTSD framework. As noted, unresolved grief due to the loss of a child may trigger similar psychological responses as other forms of chronic stress (i.e. PTSD). The acute grief response has been likened to PTSD in that individuals experience emotional numbing, cognitive intrusions, and avoidance. Whereas these experiences are treated as symptoms in the diagnosis of PTSD, they are conceptualized as coping strategies in bereavement, at least in the initial stages. Although these responses might be effective in reducing negative emotional states in the short run, they may prove problematic over time. For example, avoidance coping in bereavement (which is similar to avoidance in PTSD) has been linked to worse outcomes than problem-focused coping strategies (Videka-Sherman, 1982), presumably because although avoidance helps the individual manage stress in the short run, it also serves to disrupt the course of working-through the trauma associated with the loss.

If unresolved grief is a form of PTSD, individuals experiencing unresolved grief may be at risk for physical health problems, similar to the increased health risks of those with prolonged PTSD. There is a biological link between PTSD and health problems stemming from events such as high levels of cortisol, compromised immune functioning, and dysregulation of the HPA axis (Bremner, Southwick, & Charney, 1999). Further, researchers have shown that people with high stress levels lack allostasis, a condition in which the body is able to adaptively adjust to constant biological and chemical fluctuations which in turn suggests better immune functioning (Ryff, & Singer, 1998). These findings are likely relevant to individuals experiencing

unresolved grief as these individuals will experience high stress levels that will lead to decreased immune functioning and possible dysregulation of biological systems.

Conversely, some individuals appear to be resilient to the stress associated with bereavement in that they experience a homeostatic return to a prior condition. In fact, some may actually be thriving, which refers to the condition of surpassing old levels of functioning (Carver, 1998). For example, these individuals may view their life as more purposeful, or their religious beliefs may deepen as a result of experiencing adversity (Schaefer & Moos, 1998).

### Current project

Most research on death of a child has utilized selected samples, often those participating in grief support groups such as Compassionate Friends. The generalizability of the data/findings from these individuals to the experiences of other bereaved parents not seeking support is questionable. Additionally, most research focuses on short-term grief responses and little is known about the long-term effects of the death of a child. In contrast, the current project employs a developmental life span approach. Stress processes unfold over considerable amounts of time and thereby become intertwined with development and aging processes (Pearlin, Shaff, & McKean, 1996). Therefore, longitudinal analyses are warranted in a thorough investigation of the effect of intense stress (i.e. death of a child) on adult functioning. The current participants were drawn from a random sample of young adults who were initially assessed prior to marriage and childbirth, and who were followed into middle age, usually long after the loss of their child. As a result, the current project allows the unique opportunity to match a non-selected sample of bereaved parents to a comparison group with similar pre-parenthood demographic variables thereby creating a clear picture of differing life trajectories.

The present study derives from the literature on many topics relevant to understanding long-term adjustment to bereavement, including literature on coping, the grief response, existing research conducted on the death of a child and its effects on parents, posttraumatic stress disorder, the conceptualization of disturbed grief as a traumatic event, the effects of stress on physical health, and resilience. The current project aims to explore the long-term effects of the death of a child on multiple measures of mental health, both positive and negative aspects, and physical health. Additionally, potential moderating factors that might impact mental and physical health, both positively and negatively, after the death of a child will be explored.

### Coping with stress

A literature on the grief response draws on concepts and terms from the broader framework of stress and coping. In this framework, stress is the process by which we perceive and appraise environmental threats and challenges (Lazarus, DeLongis, Folkman, & Guen, 1985). Generally, stress is experienced as a negative event that can threaten one's resources, health, deeply held beliefs, and self-image (Hobfoll, 1989). Stress occurs when there is a perception of a stressor; an event that disrupts homeostasis (Perrez & Reicherts, 1992).

Coping strategies are conceptualized as actions and cognitions aimed at reducing stress and mastering stressful situations (Videka-Sherman, 1982). Lazarus (1966) highlighted the importance of cognitive factors in coping with stress. His model of stress assumes two levels of cognitive appraisal of a stressor. First, primary appraisal occurs. This refers to the person's initial evaluation of the stressor and its meaning to the person, including the evaluation of whether or not the event is relevant to and congruent with one's goals. Next, secondary appraisal is the process of evaluating one's options for effectively dealing with the stressor (i.e. coping ability). After one has evaluated the threat of the stressor, now it is time to employ some form of

coping mechanism by which to deal with the new problem. People often employ problem-focused and emotion-focused coping strategies at this stage. The goal of problem-focused strategies are to actively and directly remedy the problem, whereas the goal of emotion-focused strategies is to remove negative feelings created by the stressor without changing the problem per se (Lazarus & Folkman, 1984).

The perceived controllability of an event may influence the types of coping employed. Folkman (1984) stated that people tend to use emotion-focused rather than problem-focused strategies when dealing with uncontrollable events. It stands to reason that if one views a stressor as immutable, then one's best option is to manage one's feelings about it, to the extent that this is possible. On the other hand, if it is possible to change the event in order to diffuse the stress, then a more active (i.e. problem solving) approach is warranted.

Schaefer and Moos (1998) conceptualize problem-focused coping as approach coping. Approach coping occurs when one implements active, logical ways of analyzing the problem, including seeking tangible support such as support in the form of assistance or advice, rather than emotional support as a palliative strategy. This strategy is associated with better adjustment to life stressors than less problem-focused strategies that do not attempt to directly ameliorate the problem (Schaefer & Moos, 1993). In contrast, avoidance coping, which is a one form of emotion-focused coping, refers to attempts to minimize the problem and venting emotions. As will be shown later, avoidance coping has been identified as a poor coping strategy in bereavement research. Although some emotion-focused strategies are effective in managing uncontrollable stress, this may not be true in bereavement. The recovery process after the loss of a loved one often entails working through emotions associated with the loss (Stroebe, Schut, and



Stroebe, 1998; Bernstein, 1997). If one avoids thoughts and emotions associated with the loss (i.e. avoidance coping), then the recovery process is hindered.

### The grief response

The grief process and associated psychological sequelae has been the focus of psychological literature since the beginnings of the field. Traditional models suggest that time heals all and that parents' grief will resolve over time. As such, one of the seminal researchers into this area, Lindemann (1944) stated that grief reactions should be completed within a few weeks after the death. Traditionally, the assumed goal of the grieving process was to cut emotional ties with the deceased so as to free the capacity to form new ties with other people (Bowlby, 1980). Once new ties were formed, the negative affect and emotions associated with grief should subside.

Within the field of bereavement that focuses on the specific challenges faced by parents who lost a child, an emerging theme is that traditional models of grief do not adequately capture the experience. For example, while Bowlby suggested that attachment to the deceased should be broken, many bereaved parents state that bonds with the deceased child are not broken, but they are transformed in ways that vary from parent to parent (Klass, 1999). Recent research also challenges traditional grief models by suggesting that grief does not always subside in a set period of time. For example, Becvar (2000) suggests that the typical time line of grief is as follows: one experiences shock and intense grief for 2 weeks, followed by 2 months of strong grieving, and then a slow recovery that takes about 2 years. However, other studies have provided data that argue that the Becvar's suggested time lime is too short. Murphy et al. (2003) found that parents reported thinking of the deaths of their children daily three and four years after the event. Perhaps even more striking is the observation of McClowry et al. (1995) in which

parents who lost their children to cancer still experience pain and loss 7 to 9 years after the death. The parents qualitatively described their experience as having an “empty space” in the family that cannot be ignored. The families continually struggled to fill this emptiness while also keeping a connection with the memory of the deceased child.

Research also challenges traditional notions of grief resolution. Loss accommodation, or grief resolution, is the supposed end point at which bereaved individuals are able to successfully carry on with their lives without experiencing unduly distressful emotions caused by thoughts of the death. Murphy et al. (2003) attempted to capture this phenomena by asking bereaved parents the following question: “At what year during your bereavement do you feel you were able to put your child’s death into perspective and get on with your own life?” They found that despite the trend that bereaved parents claimed to have reached loss accommodation 4 years after their child’s death; these parents simultaneously reported higher levels of mental distress than controls (60% of mothers and 50% of fathers met diagnostic criteria for a psychological disorder at this time). Similarly, Moore et al. (1988) found that bereaved parents reported more emotional distress than non-bereaved parents two years after the death of the child. In fact, some research suggests that grief may decrease in intensity in the second year, and then increase again in the third year (Rando, 1983). It is possible that parents’ social support decreases as time goes by as outsiders assume that the parents are “getting over it” and moving on with their lives. In sum, the literature suggests that there is no universal set amount of time for parents to recover from the tragedy of the death of a child. In fact many parents may grief indefinitely (Rubin, 1993; Klass, 1999).

In response to problems noted with traditional models, alternative models have been created. For example, Sanders (1989) proposed a model of bereavement involving five stages:

shock (e.g. initial disbelief), awareness (e.g. recognition of the loss), conservation (e.g. attempts to preserve the memory of the deceased), healing (e.g. searching for meaning, relinquishing roles), and renewal (e.g. personal growth and acceptance of the death). Stroebe, Schut, and Stroebe (1998) attempted to combine attachment focused models of bereavement and stress theory and thereby created a formulation of loss vs. restoration-orientation model of bereavement. They state that bereaved individuals vacillate between loss-oriented coping in which the person is focusing on dealing with the loss (i.e. attachment) and restoration-oriented coping in which the person is adjusting to the secondary losses such as responsibilities formerly owned by the deceased (i.e. stress coping). Theoretically, individuals typically engage in loss-orientation in the time immediately after the death and eventually move towards restoration-orientation. This is an interesting model conceptually, but it has not yet been empirically validated.

In addition to directly coping with the loss of the loved one, grief has also been described as the loss of an “assumptive world,” as the generalized sense of predictability and stability has been challenged (Gilbert, 1997; Emmons, Colby, & Kaiser, 1998). This state of psychological upheaval leads to an evaluation of one’s beliefs and morals. Accordingly, reconstructing one’s assumptive world by making meaning of both the survivor and deceased’s lives is a key feature of grief work (Klass, 1999).

### Gender differences in grieving

In general, women tend to report more global emotional distress in the context of grieving over the loss of a child than do men (Moriarty, Carroll, & Cotroneo, 1996; Martinson, Davies, & McClowry, 1991; Rando, 1983; Schwab, 1996; Sidmore, 2000). Mothers also report more intense grief (Fish, 1986) and survivor guilt (Schwab, 1996) than fathers. These differences

are consistent with the finding that women display higher levels of several psychiatric disorders, such as depression and posttraumatic stress disorder than men (American Psychiatric Association, 1994). Similarly, women rate both positive and negative stressful life events at a higher intensity than men (Sowa, & Lustman, 1984). This may simply reflect underlying gender differences in response to stress rather than suggesting anything unique about gender and the bereavement process per se. Furthermore, these gender differences are consistent with cross-cultural findings of women being more expressive emotionally and men being more restrained in the display of affect (Haig, 1990).

Although this trend is consistent with other findings, researchers have attempted to explain the phenomenon. One explanation of causal mechanisms driving the observed effect of mothers experiencing more grief than fathers is based on attachment theory (Feeley & Gottlieb, 1988). Traditionally, mothers are the primary care givers and therefore may develop deeper attachment bonds with the child. If so, it stands to reason that the mother would be affected greater by the loss of that child.

It is possible that women and men utilize different coping strategies to deal with the child's death and, therefore, mothers and fathers experience different emotional reactions to the event. It has been suggested that women use passive withdrawal approaches (Fish, 1986) such as crying frequently and staying alone (Schwab, 1990) and escape-avoidance tactics such as sleeping more than usual (Moriarty, et al., 1996) in response to the death of a child. Forrest, Standish, and Baum (1982) found that fathers engaged in increased involvement in outside activities after the death of a child and therefore "kept busy" as a means of consolation. Men are also more likely to use the cognitive strategy of intellectualization when dealing with the death of a child (Mandell, McAnulty, & Reece, 1980).

### Effect of death of a child on the marriage

The fact that parents may deal differently with the death of a child may negatively impact their communication patterns and undermine the stability of the marriage (Littlefield & Silverman, 1991). As married partners, parents are both individuals and members of a dyad, and therefore must resolve grief in a manner that is comfortable for them as individuals while simultaneously considering the effects of their actions on the marital bond. It has been hypothesized that discordant coping negatively impacts the marriage (Moriarty, et al., 1996). A related phenomenon has been coined “grieving out of synch,” in that the parents experience the grief at different times and/or express grief in different ways (Rando, 1986). As a result, parents may be confused by their partner’s reaction to the death. This creates distance in the marital relationship and perhaps fosters a misunderstanding that the other is not grieving properly. Further, if two people experience a mutual loss, they are not as likely to have the resources to help each other deal with the loss (Rosenblatt, Spontgen, Karis, Dahl, Kaiser, & Elde, 1991).

Additionally, the overall level of grief experienced impacts the marital relationship. Bohannon (1991) found a positive correlation between level of subjective grief and spouses’ negative feelings about their marriage, though this effect dissipated after one year. Further, the author found that women with high levels of social isolation and somatization considered divorce the most. Najman, Vance, Boyle, Embleton, Foster, & Thearle (1993) found that parents who experienced the death of an infant divorced at a higher rate than a control group, and that there was a decline in the subjective quality of the relationship in those parents who lost an infant and remained married. The death of a child may have “ripple effects” and thereby the parents begin to question the nature of their marriage, as well as each other’s competency as a provider and protector of their young (Gilbert, 1997). A unique situation may arise when the child dies from

complications of a genetic abnormality or heritable illness. In these cases, parents may blame each other for the child's death, which leads to marital discontent (Littlefield & Silverman, 1991).

However, not all grief coping strategies lead to negative marital outcomes and not all marriages suffer as a result of the death of a child. In fact, a recent meta-analysis of thanatological literature suggests that there is inconclusive evidence that the death of a child increases the frequency of divorce in parents (Schwab, 1998). The author proposed that this experience strengthened marital bonds in many parents, and that ultimately factors such as the couple's effectiveness in communication and level of closeness may play a larger role in divorce than the death of a child. Several strategies of grief coping have been identified as contributing to marital satisfaction. Bowman (1990) found that the strategy of attempting to improve the emotional quality of the marriage after the loss of a child, as opposed to cognitive problem solving strategies, was positively related to marital happiness. Other strategies noted that bolster the marriage after the death of a child are having a shared focus (i.e. focusing on surviving children), spending time alone as a couple, experiencing the loss as a shared event, having no expectations to grieve identically, and grieving together (Gilbert, 1997). Additionally, Broman, Riba, & Trahan (1996) found that social support moderated the relationship between the death of a child and marital well-being in that spouses with high levels of social support reported marital well-being despite the traumatic event of the loss of a child.

### Posttraumatic Stress Disorder

Posttraumatic stress disorder (PTSD) is unique among mental disorders in that its diagnosis requires the presence of an environmental stressor. PTSD is characterized by a constellation of distressing symptoms that persist at least one month after exposure to an extreme

traumatic stressor. As such, the “person experienced, witnessed, or was confronted with an event that involved the actual or threatened death or serious injury of self or others” (APA, 1994). The event of learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate is listed in the DSM-IV as an example of a traumatic event (APA, 1994). In addition, there is precedence in research literature to conceptualize less catastrophic events, chronic stressors, and events that might not fit the traditional DSM-IV criteria as events that may elicit PTSD reactions. For example, PTSD has been examined as a result of sexual harassment (Avina, 2002), pregnancy loss (Engelhard, Maastricht, van den Hout, & Arntz, 2001), repeated emotional bullying in adolescence (Weaver, 2000), committing a homicide (Pollock, 1999), experiencing a stroke (Sembi, et al., 1998), coronary problems requiring surgery (Doerfler, Pbert, DeCosimo, 1994), undergoing obstetric and/or gynecological procedures (Menage, 1993), experiencing panic disorder (McNally, 1997), working in a hospital emergency room (Laposa, & Alden, 2003), and completing a physician internship (Klamen, Grossman, & Kopacz, 1995). Some of these examples illustrate high frequency events (e.g. illness), others demonstrate the negative effects of controllable events (e.g. committing a homicide), and yet others show PTSD symptomatology as a result of an event involving no physical threat (e.g. emotional bullying, sexual harassment).

The person’s response to the traumatic event must include extreme feelings of horror or helplessness. The associated symptomatology includes: persistent re-experiencing of the traumatic event, such as intrusive distressing recollections of the event, nightmares of the event, and intense distress at exposure to cues that symbolize the event, persistent avoidance of stimuli associated with the trauma, such as efforts to avoid thinking about the event, numbing of general responsiveness, such as feeling detached from others or having a restricted range of affect, and

persistent symptoms of increased arousal, such as hypervigilance, irritability, and difficulty concentrating (APA, 1994). Of note is the fact that 50-90% of individuals with PTSD also meet criteria for another psychiatric disorder, frequently substance abuse/dependence and major depression (Freedy, Shaw, & Jarrell, 1992). For some disorders (e.g. depression) this may be a result of the overlap of diagnostic criteria rather than suggesting truly distinct disorders. Substance use may be a maladaptive coping strategy to escape constant presence of disturbing and intrusive cognitions (Kilpatrick, 1993).

Traditionally, theorists proposed that PTSD reactions, specifically the physiological stress response, were evolutionarily adaptive in the short run as they allow the individual to protect oneself. However, as research accumulates, evidence emerges that PTSD is more than a prolonged typical stress reaction (Yehuda & McFarlane, 1995). A clear dose-response pattern has been observed in which the severity of the trauma is positively associated with the development of PTSD (Sutker, Uddo-Crane, & Allain, 1991). Factors such as the grotesqueness of the event, elements of unexpectedness and unpreparedness, and the degree of personal involvement in the event, all contribute to a person's vulnerability to develop PTSD (Kulka, et al., 1990). Additionally, specific psychosocial risk factors have been identified for the development of PTSD. Individuals with lower levels of personal hardiness, decreased family cohesion (Sutker, Davis, Uddo, & Ditta, 1995), female gender (Norman, 1988), lower levels of education (Gibbs, 1989) prior trauma history (Resnick, Kilpatrick, Best, & Kramer, 1992), and minority status (Kulka, et al., 1990) are most likely to develop PTSD. Additionally, Vasterling, et al., (1997) found that PTSD-diagnosed combat veterans performed significantly worse on measures of premorbid verbal intellectual functioning (i.e. WAIS-R) than their non-PTSD peers.



The authors argue that verbal skills may buffer the development of stress-related psychopathology.

These observations provide support for a diathesis-stress model of PTSD in which individuals with predisposing factors are more susceptible to developing PTSD when exposed to highly stressful situations. Accordingly, it is generally recognized that it is not the exposure to a stressor alone that leads to poor outcomes, but additionally the way in which the person perceives and responds to it (Horesh, et al., 1996). In reference to PTSD, these individualistic perceptions are influenced by personal and environmental resources (Sutker, Davis, Uddo, & Ditta, 1995). Coping strategies, which may be viewed as defense mechanisms for dealing with emotional problems and difficulties (Plutchick, 1989), are particularly relevant to the development of PTSD. Solomon, Mikulincer, and Flum (1988) and Nezu and Carnevale (1987) found that persons with PTSD tend to report more emotion focused coping strategies than problem focused. Likewise, individuals with PTSD also engage in more avoidance coping than active coping strategies (Sutker, Davis, Uddo, & Ditta, 1995). Therefore, while emotion-focused coping has shown to be effective when dealing with immutable problems in other situations, this argument does not appear to hold in regards to PTSD. Perhaps the problem lies in the fact that emotion-focused coping does not facilitate the cognitive processing of the traumatic event, which has been found to be effective in reducing PTSD symptoms (Park, 1999).

A complimentary view to the stress and coping approach is Horowitz's (1986) cognitive model of coping with traumatic events. However, this theory attempts to explain primarily one component of traumatic reactions; cognitive regulation. The model proposes that the intrusions and avoidant behavior that characterize PTSD are fluctuations in cognition that are contingent upon the amount of regulatory control exerted by the individual. Regulatory control refers to the

process of actively warding off or re-experiencing aspects of the traumatic event that occurs when the event itself cannot be changed. The motivation behind the efforts to regulate cognitions is a desire to reduce cognitive dissonance between existing schemas and incongruent information (i.e. the trauma). In order to make sense of the trauma, schemata and information regarding the trauma must be revised. Avoidance occurs when too much cognitive effort is spent attempting to deny the existence of the event occurs. Alternately, too little control of cognitive thought processes leads to intrusive thoughts of the event. The final product of poor regulation between denial and intrusion is the continual rehearsal of the negative experience and fearful emotions.

Alternate theories have attempted to elucidate the casual mechanism of intrusive/re-experiencing symptoms. For example, a neuropsychological interpretation of intrusive thoughts/re-experiencing phenomena in PTSD states that multiple neuromodulators released in high concentrations during trauma lead to the overconsolidation of memory, which leads to re-experiencing symptoms such as nightmares and flashbacks (Pittman, 1989).

#### Death of a Child as a Traumatic Event

Current theory suggests that there are no clear boundaries between everyday and catastrophic stress (Uddo, Allain, & Sutker, 1996), as people experiencing common events such as bereavement may exhibit PTSD-like symptoms. Similarly, Murphy et al. (1999) asserted that the loss of a child causes psychological and behavioral sequelae similar to posttraumatic stress reactions. Rando (1997) compared the acute grief response to the PTSD response and noted commonalities such as the fact that both processes are predated by an environmental event, and they involve working through negative affect, integration of cognitively disturbing material, acquisition of new ways of adapting in the world, an emotional relocation of what was lost as a

result of the traumatic event or death, integration of the event into one's life, and formation of a new identity post-trauma/death. Simpson (1997) further strengthened the link between PTSD and bereavement symptomology by outlining all diagnostic criteria for PTSD Criterion B (intrusion symptoms), C (avoidance symptoms), and D (increased arousal) and citing research that demonstrates the presence of these exact symptoms in bereaved individuals. Examples include distressful dreams about the deceased (Rando, 1984), efforts to avoid all reminders of the deceased (Worden, 1983), jumpiness (Parkes, 1982) and a sense of restlessness (Stroebe & Stroebe, 1987).

Given the strong empirical support for bridging the two fields of bereavement and PTSD, it is logical to view bereavement within a framework of stress response systems (Stroebe, Schut, & Stroebe, 1998). Bereaved parents exhibit symptoms of cognitive avoidance, intrusive thoughts, and hypervigilance. As such, clinical researchers advise clinicians working with bereaved parents to assess posttraumatic stress symptoms and treat these symptoms rather than just discussing the loss of the loved one per se (Rando, 1993).

Symptoms of avoidance and intrusive thoughts have been examined in bereavement research. In clinical observation, Kauffman (1994) stated that the initial reaction to death is dissociation in which a part of the self seems to have been cut off from reality. Klass (1999) observed that as the finality of the death is understood, thoughts of the deceased appear to be recurrent and almost impossible to stop. Some researchers hypothesize that while these intrusions are unpleasant, they are necessary for the healing process as integration of the negative event only begins when the negative material is activated (Horowitz, 1991). However, if integration does not occur, the individual is left vulnerable to more psychological distress. Further speculation suggests that a recursive process called kindling, which has received

empirical support in neurophysiological research (Johnson & Roberts, 1995), may occur in PTSD. Kindling refers to a model of induced vulnerability to seizures in which an animal's threshold for seizures may be experimentally manipulated by experimentally inducing seizure activity. An analogy based on the principle underlying kindling has been offered for PTSD vulnerability. This analogy suggests that the emotional distress one experiences after a trauma leads to further sensitization and increased susceptibility to subsequent stressors (Kramer, 1993; Suomi, 1991).

In regards to the PTSD symptom of avoidance, cognitive distortions such as denying the severity of the loss are frequently employed by the bereaved. Znoj and Keller (2002) have suggested that emotion regulation may be the greatest challenge posed to bereaved parents. They describe a consistency-safeguard theory to account for the coping strategies commonly seen. In order to protect oneself from negative emotions, safeguards such as cognitive strategies of ignoring facts, behavioral retreat, and cognitive distortions are often created to dilute direct pain associated with the constant reminders of the death and the unfulfillment of expectations (Znoj & Grawe, 2000). By minimizing the discrepant perceptions of an expected/anticipated future that includes the deceased and the reality of their absence, one can reduce emotional reactivity, which may be beneficial in the short run, but not in the long run as it prevents the emotional processing of the traumatic event. This explanation of avoidance behavior based on the concept of attempts to reduce discrepancies between incoming information (i.e. the death) and existing schemas (i.e. plans for future) is strikingly similar to Horowitz's model of cognitive regulation in PTSD. Both models suggest that the individual tries to restore order by regulating his/her cognitions, and that this strategy may lead to disturbed outcomes. Videka-Sherman

(1982) provides supportive evidence in a study that identified the use of escape tactics, such as “trying not to think about it”, as associated with higher levels of self-reported depression.

### Effect of Chronic Stress on Physical Health

Psychosocial factors such as stress may influence the central nervous system, endocrine system, hormonal systems, and neurotransmitters (McLean & Reichlin, 1981). There are a myriad of possible explanations for this effect of stress affecting physical health, including changes in immune functioning, dysfunctional neurotransmitter systems, poor health practices, and emotional dysregulation. Several common diseases in which psychosocial factors have been implicated are rheumatoid arthritis, thyroidism, anemia, lupus, Grave’s disease, multiple sclerosis, colitis, and diabetes (Solomon, 1981; Weenolsen, 1988) as well as viral reactivation (Lovallo, 1997).

There is a common coexistence of PTSD and somatic complaints, including fatigue, gastrointestinal, neurological, cardiopulmonary, and auditory-visual disturbances (Uddo, Allain, & Sutker, 1996), and these symptoms may persist even 20 years after the trauma exposure (Sutker, Allain, & Johnson, 1993). Wagner, et al. (2000) found that PTSD symptomatology predicted self-reported health problems in Gulf War veterans two years after duty. Another study reported that specifically hyperarousal symptoms of PTSD uniquely account for much of the variance in self-reported health problems (Kimberling, Clum, & Wolfe, 2000).

An alternative explanation for the association between PTSD and somatic complaints is based on a process coined “disordered information processing” (McFarlane, Weber, & Clark, 1993). This model states that individuals with PTSD may overestimate the potential negative threat of bodily sensations. Explicitly, when these individuals are overly vigilant to

physiological sensations occurring in their body, baseline and routine physical sensations may be misinterpreted as somatic illness (Berry & Pennebaker, 1993)

Psychological trauma can cause longstanding alterations in one's neurobiological response to stress and may contribute to somatic symptoms expressed in PTSD (Charney et al, 1993). The stress response, or "flight or fight" response (Cannon, 1914) is triggered by the sympathetic nervous system. In response to stress, the person's heart rate accelerates, blood pressure increases, pupils dilate (allowing more light to enter the eye), and skin vasculature constricts (as to limit blood loss if injury occurs) (Southwick, Yehuda, & Charney, 1997). This process is beneficial during actual exposure to danger, however, the system may become hyperresponsive after trauma exposure and therefore activate too frequently in situations that do not warrant such a strong physiological response.

Specific neurological pathways and neurotransmitters have been shown to be involved in stress responses and may account for dysregulation of biological systems as a result of stress. Animal studies have shown that stress causes changes in brain structure and function (Bremner, Southwick, & Charney, 1999). For example, the locus coeruleus, a brain structure that responds to internal changes by releasing the neurotransmitter norepinephrine, has been implicated as important to the stress response (Bremner, Southwick, & Charney, 1999). Stress causes rapid activation of this structure and when a person is overly stressed the locus coeruleus cannot keep up with the synthesis demand for norepinephrine. Thus overall levels of this neurotransmitter are decreased. Lower levels of norepinephrine are associated with behavioral disturbances such as "learned helplessness" in which the stressed individual abandons efforts to improve his/her condition after long periods of uncontrollable stress, even when relief is obtainable (Petty, Kramer, Wilson, & Chae, 1993). Further, sleep disturbances noted in PTSD may be due to

noradrenergic dysregulation (Ross, et al., 1994). Other neurotransmitters such as dopamine play a key role in the stress response. High levels of stress result in increased dopamine release from the nucleus accumbens. Dopamine has been suggested to influence mood and, as such, alterations in this system have been suggested as causes of symptoms of emotional numbing in PTSD (Bremner, Southwick, & Charney, 1999). Additionally, the neurotransmitter serotonin plays an important role in the regulation of aggression and mood (Yehuda et al., 1988). The serotonergic receptors of individuals exposed to stress (i.e. veterans with PTSD) show heightened sensitivity and these alterations may contribute to behavioral manifestations of the posttraumatic response (Southwick, Yehuda, & Charney, 1997).

Other chemical substrates of the stress response include opiates and the Hypothalamic-Pituitary-Adrenal Axis (HPA Axis). Endogenous opiates create an analgesia to pain known as stress induced analgesia (Helmstetter, & Fanselow, 1987). Many war veterans display a decreased sensitivity to pain during reminders of combat suggesting that reminders of a trauma stimulate increased opiate release (Van Der Kolk, Greenburg, Orr, & Pitman, 1989). The HPA axis system plays a role in releasing cortisol during the stress response (Bremner, Southwick, & Charney, 1999). Many studies suggest that alterations in HPA axis functions may be associated with PTSD symptomatology (Southwick, Yehuda, & Charney, 1997).

These data showing that stress affects physiological functioning suggest that loss of a child may produce similar central nervous system abnormalities. Consistent with this notion, there is evidence that bereavement is associated with negative health consequences and even higher mortality rates (Parkes, 1996). Levav et al. (2000) found that bereaved parents had higher risks of developing cancers involving neuroendocrine and immune systems such as lymphatic and hematopoietic malignancies. Further, parents already diagnosed with cancer at the time of

their child's death were found to die earlier than other nonbereaved cancer patients. A decline in good health practices was suggested as a causal mechanism explaining the link. High rates of hostility after the death of a child also place the parent at risk for physical problems, as hostility has been associated with decreased immunological functioning (Moriarty, Carroll, & Cotroneo, 1996).

### Resilience

Resilience refers to a homeostatic return to a prior condition following a stress-induced disruption (Carver, 1998). Some individuals who experience stress and trauma are able to return to prior levels of functioning after a period of adjustment, or even gain new coping skills and thus exceed old levels of functioning (i.e. thriving). Indeed, some trauma survivors indicate that they have gained increased coping skills, enhanced social relationships, and deepened perspectives on life as a result of their traumatic experience (Parks, 1999). It is important to understand the mechanisms by which this recovery/growth process is driven.

One potential mechanism for this effect is perceived social support. Parents who have lost a child whom report higher levels of perceived social support exhibit better psychological outcomes than bereaved parents with lower levels of perceived social support (Klass, 1999). Additionally, Wheeler (2001) reported that the most frequent reason bereaved parents offered for recovery was contact with other people, including friends, parents, spouses, surviving children, and other bereaved parents.

Another potential mechanism for resilience or possible thriving after early child death emerges from the process of working through the trauma to achieve a sense of meaning from the event. The death of a child destroys one's longstanding and comfortable ways of interpreting the world and interacting with others (Brabant, Forsyth, & McFarlain, 1995). For many, this creates



an existential crisis which must be resolved. There is a literature deriving from clinical experience which addresses this topic. In general, clinicians state that resolving this existential crisis (i.e. make personal meaning out of the death of a child) leads to resilience (Wheeler, 1994; Gilbert, 1997; Wheeler, 2001).

A related challenge associated with bereavement is the need to re-establish an integrated view of self in regards to various life roles in order to progress forward after the death of a child. The role disruption that occurs when the parenting role abruptly ceases greatly distresses parents because the self-conception of being a mother or father is often an integral part of one's self concept. This role is obliterated after the death of a child and is thereby an affront to one's self esteem. In a study of mothers, Talbot (1997) suggested that in order to reinvest in life after the death of a child, mothers must expand their identity by preserving and honoring the memory of their past life as a mother while assuming new roles. While role disruption is a problem for all parents, it may be especially salient for single mothers who do not have the additional variegated role of spouse to help diffuse the disruption (Videka-Sherman, 1987).

The birth of new children after the loss of a child may lead to resilience. Many parents refocus their energy on surviving children or they have other children soon after the death of a child. This strategy has been referred to as "constructive action," as the parent is seeking new fulfillment in life (Videka-Sherman, 1987). Videka-Sherman (1982) found that replacing the deceased child with another child was a significant predictor of better psychological adjustment to the loss. This appears to be a frequently used coping strategy, as Najman, et al. (1993) found that bereaved parents had more subsequent children than a control group of aged matched adults. However, a caveat to the above argument must be noted. The mere presence of a higher number of children in the household may not necessarily lead to resilience. Nelson and Frantz (1996)

found that parents of larger families experienced more estrangement, anger and less openness as they dealt with the loss of a child. It was hypothesized that these parents did not have the energy to meet the extenuating needs of all members of the family and thereby felt feelings of detachment and loneliness. Therefore, although having another child is generally associated with good adjustment, it can lead to problems if the family is too large and overly taxes the parents' resources.

Trauma survivors often increase their commitment to other life goals, particularly goals that connect the person to a larger community (e.g. religious community) as a strategy of dealing with the trauma (Emmons, Colby, & Kaiser, 1998). Similarly, religious affiliation may serve as a protective factor for individuals dealing with the death of a child. Hettler and Cohen (1997) found spiritually based coping (receiving guidance from God) to be a predictor of stress-related growth. This strategy may be very fruitful for some individuals as people have turned to religious leaders to help them comprehend incomprehensible events throughout history (Klass, 1999).

Finally, there is reason to believe that resilience may occur at the physiological as well as the psychological level. Bidirectional influences between psychological and physical health variables exist. For example, positive emotions, positive relationships, and positive feelings of self-efficacy are thought to ameliorate the negative effect of stress on immune functioning, which in turn affects physical health (Lovallo, 1997). As such, it is both viable and necessary to examine the effects of stress in the form of bereavement on physical health.

### Summary and Hypotheses

The current project will examine the long-term effects of a traumatic event, the death of a child, on midlife parental functioning. The current project is unique not only in that few studies

consider long term effects, but also in that it will utilize a random sample of bereaved parents (i.e. not parents explicitly seeking support). Further, this sample of bereaved parents will be matched to a non-bereaved sample of their contemporaries on characteristics that existed prior to the death of the child. Data are available for the parents from their own teen years to the present, which will provide a unique opportunity to examine life trajectories both before and after the death of a child. These two groups of parents will be compared on measures of both positive and negative aspects of mental health and physical health. Additionally, specific within group differences will be examined to determine which factors lead to resilience or hinder recovery following the death of a child. The choice of moderating variables was guided by current theoretical thought and empirical findings.

### Hypotheses

- 1.) It is hypothesized that parents who experience the death of a child will exhibit poorer mental and physical health and less educational and financial success than parents who do not experience the death of a child. Specifically, mental health will be conceptualized by the following constructs: problematic alcohol consumption, depression, autonomy, self-acceptance, environmental mastery, personal growth, positive relations with others, and purpose in life. Self-reported absence of perceived social support and social interaction will also be utilized as a marker of negative mental health. Physical health problems will be identified via self-reported somatic symptoms, medically diagnosed illnesses, and perceived health status. Occupational prestige, total years of education, and total household income will serve as markers for educational and financial success.
- 2.) It is hypothesized that moderating variables that influence the relationship between death of a child and mental and physical health outcomes exist. In particular, the presence of

other children living at the time of the death, the birth of a new child after the death, social participation, religious participation, occupational satisfaction, the presence of someone with whom to share, and purpose in life are hypothesized to impact the effect of death of a child on physical and mental health outcomes. High levels of the continuous variables of religious participation, social support, purpose in life, and occupational satisfaction will decrease the negative impact of death of a child on mental and physical health. Thus, high levels of these variables are conceptualized as factors leading to resilience after the experience of death of a child. Conversely, low levels of these variables are risk factors that may increase the negative effect of death of a child on mental and physical health. The presence someone with whom to share, the presence of other children in the home, and the birth of a child after the death will also reduce the negative effect of death of a child on mental and physical health. Accordingly, the presence of these factors will lead to resiliency.

## Chapter 2

### Method

#### Participants

The Wisconsin Longitudinal Study is a long-term study of a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957, along with a smaller sample of their siblings. Survey data (telephone interviews and mailed questionnaires) were collected from the graduates in 1957, 1975, and 1992. Graduates' parents completed a mail survey in 1964, and a selected sample of 1/3 of the graduates' siblings (N= 2108) was created and interviewed over the telephone in 1977. This sample was expanded to include 4062 siblings in 1994. The additional siblings were randomly selected from all graduates with a living sibling. Both telephone and mail surveys were administered to 80% of the eligible cases, and the mail survey with a supplement containing key items that were on the telephone survey were sent to the remaining 20%.

The current sample of parents who experienced the death of a child were identified by 1992/94 data included in a "children's roster". The respondents were specifically asked if any of their children were deceased and if so, the month and year of the death. The graduate respondents (but not sibling respondents) were offered a choice of "before 1975" if they did not remember the year of their child's death. The primary sample of the current project consists of 713 participants who indicated that they lost a child. Of these, 508 were graduate participants and 205 were sibling participants. There were 364 participants (283 graduates and 81 siblings) who reported that they lost a child prior to 1975/77 and 316 participants (222 graduates and 94 siblings) who reported that they lost a child after 1975/77. Some participants (26 graduate

respondents and 1 sibling respondent) refused to give a year of their child's death. An additional 6 participants (4 graduates and 2 siblings) reported that they didn't know the year of their child's death.

A comparison group of 713 participants that closely resemble the death of child group was created based on several background characteristics. A stratified random sample was generated from all potential participants who had not lost a child. Participants with children within the same range of socio-economic standing in 1957 (measured by father's occupational prestige scores and 1957 family income) as the death of child group were randomly selected for the current comparison group. Specifically, these individuals have children, as determined by examination of the 1992/94 children rosters. Gender of the respondent and family of origin size were also considered. These variables were selected because they are known to differentially impact both the rates of mortality (e.g. socioeconomic status) (Mare, 1982), and grief reactions following death (Moriarty, Carroll, & Cotroneo, 1996; Martinson, Davies, & McClowry, 1991; Rando, 1983; Schwab, 1996; Sidmore, 2000; Videka-Sherman, 1987; Nelson, & Franz, 1996). Additionally, IQ as assessed in 1957, whether or not the participant lived with both parents during the majority of high school, population of the respondent's hometown community, father's total years of education, and mother's total years of education were considered. This information was extracted from 1975/77 reports of family size at the age of 16 and 1957 data regarding household income, parent's educational background and occupational prestige, and participants' cognitive testing scores. See Table 1 for a full summary of the bereavement and comparison groups' continuous demographic characteristics.

Table 1

*Background Characteristics of Bereavement and Non-bereavement Groups*

	Bereavement Group (N= 713) M(SD)	Non-Bereavement Group (N= 713) M(SD)	F value	Significance Level
Father's Occupational Status in 1957	311.77(211.43)	310.26(226.63)	.02	>.05
Average Parental Income in 1957 (Dollars)	5700.90(4200.63)	5600.84(4000.63)	.21	>.05
# of Years of Father's Education	9.26(3.34)	9.52(3.37)	1.66	>.05
# of Years of Mother's Education	10.25(2.82)	10.24(2.85)	.00	>.05
IQ score (Henmon-Nelson)	100.60(14.42)	103.04 (14.69)	.72	>.05
Total Number of Siblings	4(3)	4(3)	.09	>.05

In addition to the variables used for stratification, bereavement and non-bereavement chi-square analyses showed that there were no significant differences in the size of the residential area of the participant's hometowns in 1957,  $\chi^2(7) = .51$ , *ns*. In the bereavement group, 265 participants lived in towns with less than 10,000 residents and 448 participants lived in towns with populations greater than 10,000. In the non-bereavement group, 288 participants lived in towns with less than 10,000 residents and 425 participants lived in towns with populations greater than 10,000. Additionally, there was no significant difference between the number of participants in each group who lived with both parents during most of high school (answered yes or no),  $\chi^2(1) = .50$ , *ns*. 507 participants of the bereavement sample lived with both parents for most of high school and 524 of the non-bereavement participants lived with both parents during most of high school. Finally, an equal number of males and females were chosen for the two groups in the current sample. Both groups are comprised of 454 females and 259 males.

### Design Overview

The data in the WLS include a detailed record of social background, occupational aspirations, schooling, military experience, family composition, social participation, detailed occupational histories, marriage histories, and information about mental and physical health (Hauser, et al., 1993). This sample is unique in that it is the only longitudinal data set containing detailed information about numerous facets of functioning of a large sample of American men and women from high school up to their mid 50s. For a complete overview of the WLS and many of the findings generated from it, see Sewell, et al. (2004).

The current study involves cross-sectional comparisons of parents at various data collection points in the WLS. Data from the following time points were used: Time 1 (1957)-pre-parenthood, Time 2 (1975-77) parenting children in middle childhood, and Time 3 (1992-



94)- midlife parenting. These comparisons allow participants to be matched based on pre-existing background characteristics (i.e. before the death of the child), and allow for the evaluation of differences in parents at later stages in the life course.

### Procedures

The original sample of 10,317 represented one third of all young men and women who graduated from Wisconsin high schools in 1957. With the cooperation of the Wisconsin State Superintendent of Schools, Wisconsin public, private, and parochial high schools assisted the researchers in identifying eligible participants and providing mailing addresses. The graduates were contacted and filled out a brief interview form (4 pages) at this time. In 1964, the parents of the original sample were contacted by mail and 8,923 filled out a brief interview survey (4 pages). In the first follow-up telephone interview in 1975, 9,138 respondents participated. The graduates were 36 years old at this time. Before receiving a phone call, the participants were sent a letter stating that the researchers planned to call because they were interested in learning about the participant's life experiences since 1957. The average duration of the phone interviews was 1 hour. In 1977, a stratified random sample of siblings of the original sample was contacted. Their sibling (the graduate) had provided their contact information to the researchers. 2,108 participated in the 1-hour telephone interview. In 1992, the original sample was contacted again by mail for study participation. 8,493 participated in a 60-minute telephone interview and 20-page self-administered mail survey. An additional 1,618 participants completed only the mail survey. In 1994, 3,501 siblings completed the 60-minute telephone interview and mail survey, while 561 siblings completed the mail survey only. The siblings ranged in age from 35 to 67 years, with an average of 52 years.

## Measures

### Background Characteristics

Family Make-up at age 16: The number of siblings (both living and deceased) for each participant was recorded in the 1975 phone interview. Participants were asked if they lived with both parents until the age of 16. This information reveals family size in 1957.

Parents' educational attainment: The highest level of education for the participants' mother and father was collected in 1957. This value reflects total years of education.

Economic indicators: Household income in 1957 was considered an indicator of the economic circumstances of the parents of each respondent and thus offered insight into the socioeconomic status of the family of origin. These figures were assembled in the 1957 mail survey and are derived from Wisconsin state tax records. Additionally, the head of the household's (usually the father) occupational socioeconomic status was measured with Duncan's Socio-Economic Index (Hauser & Warren, 1997).

Population of Residential Area in 1957: The size of the county in which the participant lived in 1957 was recorded in 1957. The degree of urbanization was coded as follows: no communities over 2500 residents, communities sized between 2500 and 4999, communities sized between 5000-9999, communities sized between 10000-24999, communities sized between 25000-49999, and communities with over 50000 residents.

Estimated IQ in 1957: All participants were given the Henmon-Nelson Test of Mental Ability during their junior year of high school. An IQ score was derived from this test administration. This group-administered test consists of 90 items arranged in order of increasing difficulty. Verbal, spatial, and numerical skills are assessed. Construct validity coefficients comparing the Henmon-Nelson to other intelligence measures commonly used in the 1950's (e.g. Army Alpha)

range from .77 to .88 and criterion validity (i.e. comparison with grades in scholastic courses) is .60 (Anastasi, Dvorak, Easley, & Guilford, 1941). Split-half reliability coefficients range from .88 to .90 for grades 7-12 (Anastasi, et al, 1941).

### Covariates

Educational attainment: Educational histories were collected/updated at each data collection point from all participants. The highest level of education attained and the total number of years of education past high school was recorded.

Economic indicators: Household income was reported in 1975/77 and 1992/94. This figure is a combination of the respondent and his/her spouse's income. Additionally, the respondent's occupational socioeconomic status was measured with Duncan's Socio-Economic Index (Hauser & Warren, 1997) at both time points.

### Outcomes

Perceived social support and social participation: At each of the two follow-up points, multiple items were collected that address perceived social support. In 1992/94 mail survey, participants were asked the following two questions: "Is there a person in your family with whom you can really share your very private feelings and concerns?" and "Is there a friend outside your family with whom you can really share your very private feelings and concerns?" These items were coded as present or absent. Instead of adding or averaging these items, they were used to ascertain whether the respondent had at least one good source of support. Affirmative answers to either item were noted in a variable measuring presence of anyone with whom to share private thoughts and feelings. This variable is relevant as previous research (e.g. Klass, 1999; Wheeler, 2001) has suggested that parents endorsing social support also report better psychological well-being.

Additionally, in the 1992/94 mail survey, participants were asked a set of questions about tangible supports. They were asked: “During the past month, have you received help with transportation, errands, or shopping?”, “During the past month, have you received advice, encouragement, moral or emotional support from friends, neighbors, co-workers?”, “During the past month, have you received help with baby sitting or child care?” The same items were asked in the reciprocal direction; that is, whether the participant *provided* each type of support to others. All items were coded 0 or 1 for “no one present/no” or “someone present/yes”. Previous research stemming from the WLS has examined resource exchange and considered this a more complex estimate of social support (Liebler, & Sandefur, 2002) as it provides information about the reciprocity of one’s social relationships. The authors use latent variable modeling to create four types of exchange: 1) low instrumental exchangers, 2) emotional support exchangers, 3) givers of instrumental and emotional support, receivers of emotional support, and 4) high instrumental support exchangers. The researchers found that about 50% of men are low instrumental exchangers and 50% of women are emotional exchangers. To date, no exploration of social exchange has been conducted with bereaved parents. With regards to the current project, reciprocal relationships were defined by the presence of both offering and receiving help (of any type) with friends, parents, children, or other relatives. The presence of any reciprocal relationship was treated as an outcome variable in current analyses.

Social participation was assessed in 1975/77 and again in 1992/94 by the following questions: “How many times, if at all, during the last four weeks have you gotten together with friends? We mean like going out together or visiting in each other's homes.” The actual number of times reported was recorded. Data from 1992/4 was used as an outcome measure, while 1975/77 data will be as a moderator affecting 1992 outcomes. Frequency of contact with friends

and relatives has predicted self-reports of depression in previous research (Sherkat, & Reed, 1992).

Participants also answered a question about social organizations to which he/she belonged in both 1975/77 and 1992/94. As with aforementioned social support variables, responses at both points in time will be examined to determine if this measure of social support changes over time. A summary count from a list of 17 possible organizations (e.g. charity groups, civic groups, neighborhood organizations, sports teams, country clubs) was obtained. This variable has been utilized in previous research as a marker of social connectedness (Hauser, 2003). Additionally, Seltzer et al. (2001) used this variable as an indication of social participation and found that parents of children with disabilities belonged to fewer organizations than parents of children with no disabilities.

Depression: Depression was assessed in the 1992/94 mail surveys by the Center for Epidemiologic Studies Depression Scale (CES-D), a 20 item self-report measure designed to measure current level of depressive symptomology (Radloff, 1977). The measure was created for use with the general population, and therefore is a valuable research tool when working with non-clinical populations. Each item asks how many days in the past week the person experienced depressive symptoms such as “feeling lonely” and “having crying spells”. Responses are coded 0 through 7 (0= no days, 7= 7days). A total score (0-140) indicates the frequency of days each symptom was experienced. A cut-off score of 17 items endorsed at any level has been recommended for identifying subjects with clinically significant depressive symptoms (Radloff, 1977). This measure has excellent psychometric properties. For example, internal consistency coefficients for the general population is .85 and test-retest correlations were moderate (e.g. .51 for 2 week interval) as expected as depression symptoms are expected to vary

over time (Radloff, 1977). Furthermore, the CES-D has been shown to exhibit good construct and criterion validity (Radloff, 1977). For example, the CES-D is correlated with other validated measures of depression (i.e. correlation with the Hamilton Clinician's Rating Scale is .44 to .54) as well as clinical ratings of depression, and discriminates well between psychiatric inpatient and general population samples (Radloff, 1977). Further, the CES-D has been used extensively in samples of mid-life and older adults (Gatz & Hurwicz, 1990) and there is evidence for good psychometric properties in the medically ill (Katz, et al., 2004). Additionally, participants were asked if they had ever experienced a depressive episode. Specifically, the question asked participants if they "ever had a time in life lasting two weeks or more when early every day (he/she) felt sad, blue, depressed, or when (he/she) lost interest in most things like work, hobbies, or things (he/she) usually liked to do for fun?".

Alcoholism Symptoms: In the 1992/94 phone survey, an alcohol symptom count was calculated for all participants. The questions posed follow the DSM-IV criteria for alcohol abuse, particularly items indicating that the person fails to carry out major obligations at work or at home because of repeated alcohol use, and that drinking has caused or worsened social or interpersonal problems. Additionally, the current questions are similar to those asked in frequently utilized research screening tools such as the Michigan Alcoholism Screening Test (MAST) (Selzer, 1971).

Specifically, the respondents were presented with 5 symptoms of problematic drinking and were asked to indicate whether the symptom had occurred. Higher numbers of endorsed symptoms reflect more problematic drinking. The symptoms assessed were: drinking 5 or more alcoholic drinks on one occasion in the last month, feeling bad or guilty about one's drinking,

feeling annoyed by others' criticisms of one's drinking habits, drinking causing a problem at work, and drinking creating problems with one's spouse, children, parents, or other near relatives. No time frame was given for the final four questions. A symptom summary count (1-5) was tallied for all participants and was used in subsequent analyses.

Psychological Well-being: In the 1992/94 mail survey and telephone survey, participants completed a subset of Ryff's Psychological Well-Being Scale, a self-report inventory which measures six dimensions of psychological well-being: 1.) *Autonomy*- sense of self-determination (e.g. "I tend to be influenced by people with strong opinions" [R]), 2.) *Self-acceptance*- positive appraisals of oneself and one's past life (e.g. "When I look at the story of my life, I am pleased at how things have turned out."), 3.) *Environmental mastery*- the capacity to manage effectively one's life and environment (e.g. "In general, I feel I am in charge of the situation in which I live."), 4.) *Personal growth*- a sense of continued growth and development as an individual (e.g. "For me, life has been a continuous process of learning, changing, and growing."), 5.) *Positive relations with others*- the presence of high quality interpersonal ties (e.g. "Maintaining close relationships has been difficult and frustrating for me."[R]), and 6.) *Purpose in life*- the belief that one's life is purposeful and meaningful (e.g. "Some people wander aimlessly through life but I am not one of them."). (Ryff, 1989a; Schmutte, & Ryff, 1997). These dimensions were based on theoretical suppositions of optimal aging, positive functioning, and normal human development, as well as research literature on life-span development and personal growth (Ryff, 1989b). Each dimension was operationalized with a 14-item scale of positively and negatively phrased items. The response format included 6 choices ranging from 1 (strongly disagree) to 6 (strongly agree). A total score of items endorsed is summed for each scale, as well as a total psychological well-being score which is the sum of all endorsed items for all six scales. The

current administration does not include all 14 items for each scale. In the mail version, the scale contains 6 items on each scale that had the highest factor loadings in previous research (Hauser, et al., 1994). The phone version contains two items for each scale. These values have been prorated to fit the scale used for the mail data. In the current study, mail versions are used for all analyses, unless they are unavailable. In this case, the phone ratings were used. Mail data was available for 1273 participants, and phone data was used for the remaining 153 participants.

Internal consistency coefficients for the scales range from .82 to .90 (Schmutte, & Ryff, 1997). Bi-variate correlations between the subscales are moderate to high, but evidence exists that the constructs are best conceptualized as separate because they possess distinguishing age trajectories, cultural profiles, and gender profiles (Schmutte, & Ryff, 1997). Additionally, structural analysis revealed a superior fit of the six-factor model over a single-factor model (Ryff & Keyes, 1995).

Physical Health: A strong precedent of obtaining information regarding health status via self report has been established in the psychological literature. Self reports of physical problems have been used as outcome measures in numerous studies examining a myriad of clinical and non-clinical populations (Alpass, 2003; Kokkonen, Kinnunen, & Pulkkinen, 2002; Hull, et al., 2002; Greenwell & Brevht, 2003; Zayfert, et al., 2002; Aarons, et al., 1999). Physical health was assessed in multiple ways in the 1992/94 mail survey. Perceptions of health were tapped by the questions: “How would you rate your health overall?” and “How would you rate your health compared with other people your age and sex?” The answer choices for these questions are: very poor, poor, fair, good, and excellent.

In order to assess the amount of diffuse somatic complaints each respondent experienced, a symptom checklist was completed by each participant. The participants either endorsed or



denied the following 22 physical problems: lack of energy, trouble sleeping, fatigue or exhaustion, headaches, visual problems, dizziness or faintness, numbness, ringing in the ears, nausea, vomiting, upset stomach, constipation, diarrhea, urination problems, aching muscles, stiff/swollen joints, back pain or strain, chest pain, shortness of breath, excess sweating, respiratory problems, and skin problems. A count of the number of symptoms endorsed provides an estimation of the amount of problematic symptoms. Furthermore, these vague somatic complaints are frequently present in individuals with PTSD (Miranda, Meyerson, & Marx, 2002; Van Ommeren, Sharma, & Sharma, 2002) and therefore are gross indicators of stress-related problems.

Finally, the total number of illnesses diagnosed by a medical doctor was recorded. Respondents endorsed or denied the following common diseases/chronic health problems: anemia, asthma, arthritis, cancer, chronic liver trouble, diabetes, serious back trouble, heart trouble, high blood pressure, circulation problems, kidney or bladder problems, ulcer, allergies, multiple sclerosis, colitis, some other illness or condition. The sum total of endorsed symptoms (0-16) was recorded. Symptom counts are common diagnostic tools in psychological research and practice. In fact, the DSM-IV relies on symptom counts as the primary source of assigning diagnostic psychiatric labels to individuals. Further, symptom counts have been used as an indicator of health problems in numerous studies (e.g. White, 2003, Vasterling, et al., 2003; Swartz, et al., 1989). Because symptom counts have been used successfully as indicators of health problems in the literature, the current study will utilize a symptom count of health complaints.

Marital history: All entrances into and exits from marriage will be recorded. The number of times married, duration of current marriage, marriage to spouse of deceased child will be

assessed. This information was originally collected in the 1975 phone interviews and was updated in the 1992/94 phone interviews.

### Moderators

Religious participation: The frequency of the respondent's religious attendance in the last year was assessed in the 1975/77 telephone survey. Answer choices for were: never, less than a few times a year, a few times a year, once a month, 2 or 3 times a month, and once a week. This was scaled as a 6 point scale with the aforementioned choices being coded as 0-5. A recent literature review found a consistent inverse association between religiousness and depression (Van Ness, & Larson, 2002). Further, evidence exists that religious participation leads to less drug and alcohol use (Hodge, Cardenas, & Montoya, 2001).

Occupational satisfaction: The degree to which participants were satisfied with their current job was assessed in the 1975/77 telephone interview by the question: "All things considered, how satisfied are you with your job as a whole?" The answer choices were: very satisfied, fairly satisfied, somewhat dissatisfied, and very dissatisfied. This four point scale has been used in previous research (Hodson, 1984), and has been found to be dependent on the corporate structure (i.e. the larger the company, the lower the job satisfaction) and capital intensity (i.e. the better the technological assets of the working environment, the higher the job satisfaction).

Number of Children: Parents completed a roster of their children in the 1975 phone interview. In the 1992/94 phone interviews, respondents updated the roster of children and provided the gender and age of all children (alive and deceased). Thus, the presence of another child alive at the time of the death and birth of a child after the death were recorded for use in the present study.

## Chapter 3

### Results

#### Bereaved Groups

Due to the wide range of child age at the time of death, for the current analyses the bereaved parents were divided into five groups; those who lost an infant under the age of 1 year (N= 197), a school aged child aged 2-16 years (N= 113), a young adult aged 17-24 years (N= 169), and an adult aged 25 or older (N= 108), and a final group of bereaved parents who did not report a date of death for their child (N=126). One-way ANOVA's were conducted to determine whether the death of child groups and the comparison group differed on background characteristics. The groups did not differ significantly on the following variables: total number of siblings, IQ as assessed in 1957, family income in 1957, and father's total years of education. The child groups differed on father's occupational status in 1957 ( $F(5,1425)= 1.26, p<.05$ ), mother's total number of years of education ( $F(5,1425)= 3.98, p<.05$ ), participant's level of education ( $F(5,1425)= 3.65, p<.01$ ), and participant's age ( $F(5,1425)= 18.25, p<.01$ ). As a result, these significant variables were treated as co-variates in the subsequent analyses. However, there does not appear to be systematic patterns of differences between the groups on the background variables. For example, the adolescent death group reported the lowest levels of fathers' occupational prestige, highest levels of mother's education, and lowest levels of participant education. The comparison group were the youngest participants, and they received the most education overall. Refer to Table 2 for a means and standard deviations for each group on all analyzed background variables.

Table 2

*Group Means of Background Characteristics*

	Comparison	Infant Deaths	Young Child Deaths	Adolescent Deaths	Adult Deaths	No Date of Death
<b>Father's Occupational Status</b>						
	310.26 <sub>abc</sub> (226.63)	336.33 <sub>bc</sub> (226.99)	294.06 <sub>ab</sub> (204.09)	270.38 <sub>a</sub> (190.40)	296.75 <sub>ab</sub> (190.23)	357.60 <sub>c</sub> (225.51)
<b>Mother's Total # of Years Education</b>						
	10.24 <sub>bc</sub> (2.85)	9.47 <sub>c</sub> (3.12)	9.52 <sub>a</sub> (2.94)	10.63 <sub>c</sub> (2.76)	9.68 <sub>ab</sub> (2.73)	10.17 <sub>abc</sub> (2.90)
<b>Total # of Siblings</b>						
	3.55 <sub>a</sub> (2.56)	3.75 <sub>a</sub> (2.82)	3.42 <sub>a</sub> (2.75)	3.70 <sub>a</sub> (2.57)	3.73 <sub>a</sub> (2.46)	3.25 <sub>a</sub> (2.52)
<b>1957 Family Income (in \$100's)</b>						
	56.84 <sub>a</sub> (40.63)	56.90 <sub>a</sub> (36.59)	58.66 <sub>a</sub> (55.14)	55.79 <sub>a</sub> (28.14)	57.19 <sub>a</sub> (49.47)	62.18 <sub>a</sub> (48.08)

Table 2, cont.

*Group Means of Background Characteristics*

Comparison	Infant Deaths	Young Child Deaths	Adolescent Deaths	Adult Deaths	No Date of Death
<b>Participant IQ (assessed in 1957)</b>					
103.04 <sub>a</sub> (14.69)	101.24 <sub>a</sub> (13.20)	102.12 <sub>a</sub> (16.77)	100.43 <sub>a</sub> (13.54)	97.78 <sub>a</sub> (14.25)	102.27 <sub>a</sub> (15.05)
<b>Father's Total Years of Education</b>					
9.52 <sub>a</sub> (3.36)	9.47 <sub>a</sub> (3.12)	8.79 <sub>a</sub> (3.42)	9.51 <sub>a</sub> (3.19)	9.03 <sub>a</sub> (3.43)	9.39 <sub>a</sub> (3.68)
<b>Participant's Highest Degree earned (0=high school, 1=AA, 2=BA, 3=MA, 4=PhD, MD)</b>					
.68 <sub>b</sub> (1.17)	.43 <sub>a,b</sub> (.94)	.56 <sub>a,b</sub> (1.09)	.37 <sub>a</sub> (.87)	.44 <sub>a,b</sub> (1.10)	.50 <sub>a,b</sub> (1.15)
<b>Participant Age (1992/94)</b>					
52.19 <sub>a</sub> (4.13)	52.65 <sub>ab</sub> (3.55)	53.95 <sub>c</sub> (4.80)	53.73 <sub>c</sub> (4.24)	55.88 <sub>d</sub> (5.54)	53.37 <sub>bcd</sub> (3.31)

Note. Comparison, n= 634-713, Infant Deaths, n= 177-197, Young Child Deaths, n= 99-113, Adolescent Deaths, n= 142-169, Adult Deaths, n= 95-108, No Date of Death, n= 110-126. Means in the same row that do not share the same subscripts differ at  $p < .05$  in the

Duncan Post Hoc Test.

## Main Effects of Death of a Child on Physical and Mental Health Outcomes and Financial Success

Prior to the analyses, the data were checked for data entry errors and outliers, and the distributions of the outcome variables were examined. The distributions indicated no need for modifications. The first set of analyses tested the hypothesis that parents who experienced the death of a child would have higher levels of mental and physical distress, lower levels of psychological well-being, lower levels of social participation and social support, and lower financial achievement than non-bereaved parents from similar backgrounds. This hypothesis was tested by entering all aforementioned physical and mental health and financial outcomes into two-way ANCOVAs with age of child at time of death and participant gender as independent variables. Specifically, 6 X 2 ANCOVAs were conducted, in which there were 6 levels of group (i.e. 5 death of child groups and 1 comparison group) and 2 levels of gender. Father's occupational status, mother's education, participant's education and age were treated as covariates. Refer to Table 3 for all raw, unadjusted means and standard deviations for all analyses. Means for men and women are presented separately.

With regard to mental health outcomes, there was a significant Child Group effect for depression scores on the CES-D,  $F(5,1418)= 6.64, p<.01$ . As expected, Duncan post hoc tests showed that parents who lost an infant, adolescent, adult, and those with no date of death reported had higher levels of depression than non-bereaved parents. There was no significant difference between the young child death and non-bereavement groups. Interestingly, there were only a few individuals who endorsed enough depressive symptoms on the CES-D to meet the recommended clinical cutoff of 17 items for clinical depression. According to CES-D self-

Table 3

*Group Means of Outcome Measures*

	Comparison	Infant Deaths	Young Child Deaths	Adolescent Deaths	Adult Deaths	No Date of Death
<b>Depression (CES-D) (N= 76-707)</b>						
Men	15.16 <sub>a</sub> (12.91)	21.02 <sub>ab</sub> (21.60)	14.94 <sub>a</sub> (15.15)	19.54 <sub>ab</sub> (14.79)	17.23 <sub>ab</sub> (15.26)	23.26 <sub>b</sub> (23.87)
Women	16.56 <sub>a</sub> (15.16)	17.66 <sub>a</sub> (17.32)	18.34 <sub>a</sub> (18.04)	19.23 <sub>a</sub> (18.00)	21.57 <sub>a</sub> (18.63)	19.07 <sub>a</sub> (17.38)
<b>Alcoholism symptoms (N= 102-713)</b>						
Men	.52 <sub>ab</sub> (1.07)	.56 <sub>ab</sub> (1.11)	.26 <sub>a</sub> (.63)	.56 <sub>ab</sub> (1.11)	.40 <sub>ab</sub> (.99)	.80 <sub>b</sub> (1.41)
Women	.24 <sub>a</sub> (.63)	.38 <sub>a</sub> (.85)	.31 <sub>a</sub> (.89)	.27 <sub>a</sub> (.62)	.21 <sub>a</sub> (.60)	.31 <sub>a</sub> (.77)
<b>Purpose in life (N= 99-713)</b>						
Men	34.29 <sub>a</sub> (8.52)	40.30 <sub>b</sub> (17.57)	38.60 <sub>ab</sub> (16.86)	40.54 <sub>b</sub> (18.46)	38.90 <sub>ab</sub> (15.27)	35.81 <sub>ab</sub> (16.40)
Women	34.21 <sub>a</sub> (6.79)	37.90 <sub>b</sub> (14.47)	38.23 <sub>b</sub> (14.75)	36.24 <sub>ab</sub> (12.18)	42.55 <sub>c</sub> (20.26)	39.48 <sub>bc</sub> (16.4)

Table 3, cont.

*Group Means of Outcome Measures*

	Comparison	Infant Deaths	Young Child Deaths	Adolescent Deaths	Adult Deaths	No Date of Death
<b>Autonomy (N=99-713)</b>						
Men	31.85 <sub>a</sub> (5.35)	32.30 <sub>a</sub> (5.69)	33.64 <sub>a</sub> (5.27)	33.30 <sub>a</sub> (6.04)	31.90 <sub>a</sub> (6.58)	31.22 <sub>a</sub> (5.22)
Women	31.12 <sub>a</sub> (6.00)	31.03 <sub>a</sub> (6.12)	30.83 <sub>a</sub> (6.72)	30.91 <sub>a</sub> (6.03)	31.75 <sub>a</sub> (6.25)	31.78 <sub>a</sub> (5.90)
<b>Environmental mastery (N= 99-713)</b>						
Men	33.45 <sub>a</sub> (5.30)	32.52 <sub>a</sub> (5.47)	33.24 <sub>a</sub> (4.62)	32.67 <sub>a</sub> (5.77)	31.97 <sub>a</sub> (6.63)	33.78 <sub>a</sub> (5.91)
Women	34.01 <sub>a</sub> (5.20)	35.87 <sub>a</sub> (.47)	33.97 <sub>a</sub> (6.30)	34.55 <sub>a</sub> (5.54)	33.91 <sub>a</sub> (5.63)	33.76 <sub>a</sub> (6.46)
<b>Positive relations with others (N= 99-713)</b>						
Men	32.75 <sub>a</sub> (5.83)	32.78 <sub>a</sub> (6.21)	33.76 <sub>a</sub> (5.59)	32.34 <sub>a</sub> (7.19)	33.26 <sub>a</sub> (7.14)	31.19 <sub>a</sub> (5.81)
Women	34.92 <sub>a</sub> (5.63)	35.87 <sub>a</sub> (5.47)	36.33 <sub>a</sub> (5.27)	35.46 <sub>a</sub> (5.54)	35.72 <sub>a</sub> (5.62)	35.09 <sub>a</sub> (6.36)
<b>Personal growth (N=99-713)</b>						
Men	32.03 <sub>a</sub> (5.94)	32.28 <sub>a</sub> (6.09)	31.83 <sub>a</sub> (6.98)	31.73 <sub>a</sub> (7.25)	31.23 <sub>a</sub> (6.70)	30.91 <sub>a</sub> (6.39)
Women	33.25 <sub>a</sub> (5.88)	33.94 <sub>a</sub> (5.96)	32.83 <sub>a</sub> (5.90)	33.73 <sub>a</sub> (5.08)	33.67 <sub>a</sub> (5.90)	34.54 <sub>a</sub> (5.70)



Table 3, cont.

*Group Means of Outcome Measures*

	Comparison	Infant Deaths	Young Child Deaths	Adolescent Deaths	Adult Deaths	No Date of Death
<b>Self-acceptance (N=99-713)</b>						
Men	33.10 <sub>a</sub> (6.07)	32.68 <sub>a</sub> (6.00)	32.86 <sub>a</sub> (5.36)	32.89 <sub>a</sub> (6.86)	32.59 <sub>a</sub> (7.55)	30.91 <sub>a</sub> (7.17)
Women	33.23 <sub>a</sub> (6.01)	33.19 <sub>a</sub> (6.98)	33.93 <sub>a</sub> (5.12)	32.66 <sub>a</sub> (6.16)	32.55 <sub>a</sub> (6.29)	33.34 <sub>a</sub> (6.99)
<b>Total psychological well-being (N=99-713)</b>						
Men	196.69 <sub>a</sub> (26.55)	195.91 <sub>a</sub> (24.97)	197.43 <sub>a</sub> (23.97)	194.67 <sub>a</sub> (25.42)	193.23 <sub>a</sub> (30.50)	188.75 <sub>a</sub> (27.47)
Women	200.76 <sub>a</sub> (27.31)	201.74 <sub>a</sub> (28.09)	201.72 <sub>a</sub> (26.64)	200.66 <sub>a</sub> (26.08)	200.91 <sub>a</sub> (27.19)	202.47 <sub>a</sub> (28.36)
<b>Total number of diagnosed illnesses (N= 73-707)</b>						
Men	1.34 <sub>a</sub> (1.81)	1.40 <sub>a</sub> (2.03)	1.40 <sub>a</sub> (2.02)	1.22 <sub>a</sub> (1.57)	2.43 <sub>b</sub> (2.89)	1.86 <sub>ab</sub> (2.09)
Women	1.47 <sub>a</sub> (1.60)	1.71 <sub>a</sub> (2.11)	1.59 <sub>a</sub> (1.42)	1.67 <sub>a</sub> (2.02)	1.66 <sub>a</sub> (1.65)	1.80 <sub>a</sub> (2.32)
<b>Perceived health compared to same aged peers (N= 73-709)</b>						
Men	4.09 <sub>a</sub> (.71)	4.00 <sub>a</sub> (.79)	4.09 <sub>a</sub> (.89)	3.78 <sub>a</sub> (.82)	3.97 <sub>a</sub> (.67)	4.11 <sub>a</sub> (.75)
Women	4.18 <sub>a</sub> (.76)	4.15 <sub>a</sub> (.79)	4.08 <sub>a</sub> (.83)	4.19 <sub>a</sub> (.82)	4.11 <sub>a</sub> (.70)	4.04 <sub>a</sub> (.88)

Table 3, cont.

*Group Means of Outcome Measures*

	Comparison	Infant Deaths	Young Child Deaths	Adolescent Deaths	Adult Deaths	No Date of Death
<b>Perceived health (N= 73-713)</b>						
Men	4.06 <sub>a</sub> (.68)	3.96 <sub>a</sub> (.68)	3.78 <sub>a</sub> (.76)	3.81 <sub>a</sub> (.57)	3.90 <sub>a</sub> (.71)	4.07 <sub>a</sub> (.72)
Women	4.19 <sub>a</sub> (.69)	4.14 <sub>a</sub> (.71)	4.11 <sub>a</sub> (.80)	4.18 <sub>a</sub> (.60)	4.04 <sub>a</sub> (.66)	4.07 <sub>a</sub> (.80)
<b>Total physical symptoms (N= 73-707)</b>						
Men	4.90 <sub>a</sub> (4.03)	5.16 <sub>a</sub> (4.23)	4.74 <sub>a</sub> (4.17)	5.45 <sub>a</sub> (4.24)	5.67 <sub>a</sub> (4.74)	5.39 <sub>a</sub> (4.38)
Women	5.56 <sub>a</sub> (4.21)	5.19 <sub>a</sub> (4.25)	5.33 <sub>a</sub> (4.00)	5.35 <sub>a</sub> (3.78)	5.94 <sub>a</sub> (4.88)	5.99 <sub>a</sub> (4.49)
<b>Total number of organizations (N= 72-503)</b>						
Men	3.33 <sub>a</sub> (2.51)	2.85 <sub>a</sub> (2.35)	3.90 <sub>a</sub> (3.48)	3.19 <sub>a</sub> (2.07)	2.88 <sub>a</sub> (3.22)	4.08 <sub>a</sub> (2.57)
Women	2.60 <sub>a</sub> (2.09)	2.79 <sub>a</sub> (2.38)	3.09 <sub>a</sub> (2.31)	2.55 <sub>a</sub> (2.10)	2.77 <sub>a</sub> (2.39)	2.95 <sub>a</sub> (2.47)
<b>Total number of visits with friends (N= 99-667)</b>						
Men	3.55 <sub>a</sub> (3.76)	2.88 <sub>a</sub> (3.08)	3.46 <sub>a</sub> (4.23)	4.67 <sub>a</sub> (4.95)	5.00 <sub>a</sub> (6.74)	3.85 <sub>a</sub> (4.10)
Women	4.36 <sub>a</sub> (4.38)	4.10 <sub>a</sub> (3.65)	3.48 <sub>a</sub> (3.14)	3.88 <sub>a</sub> (2.89)	4.61 <sub>a</sub> (3.86)	4.18 <sub>a</sub> (4.05)

Table 3, cont.

*Group Means of Outcome Measures*

	Comparison	Infant Deaths	Young Child Deaths	Adolescent Deaths	Adult Deaths	No Date of Death
<b>Total number of visits with family (N= 73-707)</b>						
Men	3.25 <sub>a</sub> (3.84)	3.93 <sub>a</sub> (4.73)	3.14 <sub>a</sub> (3.76)	2.53 <sub>a</sub> (3.12)	4.43 <sub>a</sub> (5.63)	3.30 <sub>a</sub> (2.88)
Women	4.10 <sub>a</sub> (4.29)	3.78 <sub>a</sub> (3.94)	3.75 <sub>a</sub> (3.94)	3.71 <sub>a</sub> (3.39)	3.74 <sub>a</sub> (3.38)	3.92 <sub>a</sub> (4.11)
<b>Total help given (N= 73-713)</b>						
Men	3.76 <sub>a</sub> (2.71)	3.35 <sub>a</sub> (2.60)	3.54 <sub>a</sub> (2.32)	3.65 <sub>a</sub> (2.63)	3.60 <sub>a</sub> (4.44)	3.86 <sub>a</sub> (2.14)
Women	4.13 <sub>a</sub> (2.45)	4.22 <sub>a</sub> (2.65)	4.28 <sub>a</sub> (2.64)	4.64 <sub>a</sub> (2.83)	3.70 <sub>a</sub> (2.49)	4.35 <sub>a</sub> (2.74)
<b>Total help received (N= 73-713)</b>						
Men	1.71 <sub>a</sub> (1.99)	1.47 <sub>a</sub> (1.78)	1.74 <sub>a</sub> (2.02)	1.41 <sub>a</sub> (1.87)	1.97 <sub>a</sub> (4.58)	1.43 <sub>a</sub> (1.57)
Women	2.20 <sub>a</sub> (2.13)	2.05 <sub>a</sub> (1.78)	2.16 <sub>a</sub> (2.34)	2.30 <sub>a</sub> (2.13)	2.15 <sub>a</sub> (1.89)	2.18 <sub>a</sub> (1.90)

Table 3, cont.

*Group Means of Outcome Measures*

	Comparison	Infant Deaths	Young Child Deaths	Adolescent Deaths	Adult Deaths	No Date of Death
<b>Occupational Prestige (N= 103-687)</b>						
Men	48.42 <sub>ab</sub> (24.82)	47.61 <sub>ab</sub> (26.04)	52.49 <sub>b</sub> (26.65)	39.95 <sub>a</sub> (23.95)	39.44 <sub>a</sub> (24.30)	45.19 <sub>ab</sub> (23.65)
Women	49.08 <sub>a</sub> (20.66)	46.18 <sub>a</sub> (22.34)	44.38 <sub>a</sub> (21.25)	46.59 <sub>a</sub> (20.73)	37.53 <sub>b</sub> (22.07)	48.64 <sub>a</sub> (20.58)
<b>Total income (N= 95-670)</b>						
Men	\$58,426.68 <sub>a</sub> (44,910.57)	\$48,616.45 <sub>a</sub> (47,231.10)	\$51,725.04 <sub>a</sub> (39,772.43)	\$43,882.89 <sub>a</sub> (27,543.11)	\$46,519.53 <sub>a</sub> (37,636.01)	51,000.01 <sub>a</sub> (34,514.81)
Women	\$48,285.60 <sub>b</sub> (45,310.67)	\$34,812.33 <sub>a</sub> (33,844.36)	\$37,251.41 <sub>ab</sub> (43,729.04)	\$38,392.48 <sub>ab</sub> (34,253.80)	\$25,819.94 <sub>a</sub> (27,221.56)	\$38,563.69 <sub>ab</sub> (27,657.52)

Note. Comparison, n= 583-713, Infant Deaths, n= 161-197, Young Child Deaths, n= 69-113, Adolescent Deaths, n= 125-169, Adult

Deaths, n= 76-108, No Date of Death, n= 94-126. Means in the same row that do not share the same subscripts differ at  $p < .05$  in the

Duncan Post Hoc Test.

reports, there were 14 clinically depressed bereaved participants (i.e., 3 participants who lost an infant, 1 who lost a young child, 4 who lost a teenager, 4 who lost an adult child, and 2 who lost a child at an unspecified age). There were also 14 participants in the non-bereavement group who endorsed clinically significant level of depressive symptoms. Therefore, current levels of clinical depression clearly could not be attributable to having lost a child. Interestingly, there was a significant Child Group effect for ratings of purpose in life,  $F(5,1388) = 8.95, p < .01$ .

Duncan post hoc tests showed that the non-bereavement group had lower ratings of purpose in life than all five death of child groups. There were no significant group effects on the following variables: alcoholism symptom count,  $F(5,1394) = 1.22, ns$ , autonomy,  $F(5,1388) = .25, ns$ , environmental mastery,  $F(5,1388) = 1.06, ns$ , positive relations with others,  $F(5,1388) = 1.38, ns$ , personal growth,  $F(5,1388) = .29, ns$ , self-acceptance,  $F(5,1388) = .83, ns$ , total psychological well-being,  $F(5,1388) = .44, ns$ .

With regard to physical health outcomes, there were no significant group effects. The specific variables investigated were: total illnesses reported,  $F(5,1277) = .80, ns$ , perceived current health,  $F(5,1276) = .71, ns$ , perceived current health compared to same-aged peers,  $F(5,1267) = .69, ns$ , total number of physical symptoms,  $F(5,1272) = .50, ns$ .

With regard to financial achievement, there was a significant group effect for total income in 1992/94,  $F(5,1297) = 2.32, p < .05$ . Consistent with expectations, Duncan post hoc tests showed that the infant death group, adolescent death group, adult death group, and group with no reported date of death had significantly lower incomes than the non-bereavement group. However, there was no significant difference between the young child death group and the comparison group. There was a significant group effect for occupational prestige, as measured in 1992/94,  $F(5,1367) = 2.49, p < .05$ . Duncan post hoc tests showed that the adult death group

had significantly lower scores than the non-bereavement group. There were no statistical differences between the latter 5 groups and the non-bereavement group.

With regard to social participation and social support, there was a significant child death group effect for marriage to the same spouse (as assessed in 1992/94) in the predicted direction. The adult death group differed significantly from the comparison group in terms of whether or not they were married to their same spouse  $\chi^2(1) = 108.00, p < .01$ . These bereaved parents were more likely to be divorced, separated, or widowed than the non-bereavement group. There were no differences between the other child death groups and the non-bereavement group. There were no significant group effects for the following variables: total number of organizations participant belongs to in 1992/94,  $F(5,917) = 1.21, ns$ , number of visits with family in past month (assessed in 1992/94),  $F(5,1269) = .75, ns$ , total amount of help given to family and friends,  $F(5,1277) = .52, ns$ , and total amount of help from family and friends received,  $F(5,1277) = .38, ns$ . There was no significant group effect for the number of visits with friends in past month (assessed in 1992/94),  $F(5,1266) = 1.43, ns$ , although the young child death group reported significantly fewer visits with friends than the adult death group. Further, chi-square analyses conducted on the dichotomous outcome variables of presence of someone with whom to share private thoughts and feelings ( $\chi^2(5) = 5.99, ns$ ) and the presence of a reciprocal relationship with others ( $\chi^2(5) = 5.15, ns$ ), showed no significant differences.

### Moderator Variables for Relationships between Bereavement and Outcomes

The next set of analyses tested the hypothesis that various support systems (e.g., religious participation) and other positive life circumstances (e.g., high job satisfaction) would moderate the relationship between the experience of a death of a child and negative mental and physical health and financial achievement. The hypothesis predicted that the event of the death of a child would have a stronger negative impact on parents with lower levels of the moderating variables. Thus, the moderating variables could be considered protective factors that buffer the negative effects of bereavement. The moderator variables were number of visits with friends in 1975/77, religious participation in 1975/77, job satisfaction in 1975/77, the presence of a friend or family member with whom to share private thoughts, and purpose in life scores. Outcome variables included depression, as measured by the CES-D, presence of a depressive episode, total number of illnesses, total alcoholism symptoms, psychological well-being, total income in 1992/94, the presence of a reciprocal relationship with anyone, and marriage to first/same spouse in 1992/94. Of note, the potential effect of the presence of someone with whom to share (moderator) on the relationship between bereavement and the presence of a reciprocal relationship (outcome) was not explored due to the overlap in the theoretical constructs of the moderator and outcome variables. In order to provide context for the moderation analyses, correlation matrices listing the relationships between the moderators and outcomes are listed in Tables 4 (for women) and 5 (for men). Finally, the impacts of having other children in the home at the time of death and giving birth to a new child after the death also were explored.

Table 4

*Intercorrelations between Women's Moderators and Outcomes*

	Visits w/friends	Religious Part	Job Satisfaction	Purpose in Life	Someone with whom to share
Depression (CES-D)	-.06	-.08*	-.11*	-.52**	-.18**
Lifetime Depression	.04	-.03	.00	-.01	.02
Number of Illnesses	-.04	-.21**	-.06	-.07*	.04
Alcoholism Symptoms	.04	-.05	-.06	.01	-.03
Psychological Well-being	.14**	.06	.07	.57**	.21**
Income	.10**	.09**	.07	.00	.10**
Reciprocal Relationship	.07	-.02	-.08	.02	.11**
Married to Same/1 <sup>st</sup> spouse	-.01	.19**	.10*	-.50	.03

\* significant at  $p < .05$ , \*\* significant at  $p < .01$



Table 5

*Intercorrelations between Men's Moderators and Outcomes*

	Visits w/friends	Religious Part	Job Satisfaction	Purpose in Life	Someone with whom to share
Depression (CES-D)	.60	.03	-.18**	-.41**	-.21**
Lifetime Depression	.07	-.14**	-.10	.09	-.06
Number of Illnesses	.10	-.19**	-.11*	.03	.01
Alcoholism Symptoms	.14**	-.05	-.07	-.07	-.06
Psychological Well-being	.08	.02	.22**	.50**	.28**
Income	.04	.10*	.08	.00	.08
Reciprocal Relationship	.04	-.05	.04	.02	.07
Married to Same/1 <sup>st</sup> spouse	-.10	.14**	-.04	-.06	.09

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Participant's age was a potential confound for death of child group differences because it had a significant, though small, association with several outcome measures (e.g., depression,  $r = -.07$ ,  $p < .01$ ; alcoholism symptoms,  $r = -.06$ ,  $p < .05$ ; income,  $r = -.08$ ,  $p < .01$ ; years of education,  $r = -.06$ ,  $p < .05$ ; presence of a reciprocal relationship,  $r = -.06$ ,  $p < .05$ ). Therefore, age was used as a covariate in all analyses. The age of the bereaved and non-bereaved participants was not significantly different. Father's occupational status in 1957 was significantly correlated with several of the outcome measures assessing financial achievement (e.g., participant's total income,  $r = .14$ ,  $p < .01$ ; years of education,  $r = .22$ ,  $p < .01$ ). Therefore, father's occupational status was considered a potential confound for death of child group differences, and this variable was treated as a covariate in all analyses concerning financial achievement.

All analyses were run treating death of child as a two-level variable (i.e., participant lost/did not lose a child). Next, the analyses were re-run contrasting each of the age groups with the comparison group. However, no consistent patterns emerged that differed substantially from the 2-group analyses. Thus, only the two-group findings are presented.

The moderation analyses involved two sets of parallel procedures, one that used only the subset of parents who lost a child after 1975/77, and the other that examined the entire sample of bereaved parents. The effects of moderators that were present before the death of the child were tested first. Specifically, the three moderators of number of visits with friends in 1975/77, religious participation in 1975/77, and job satisfaction in 1975/77 were first analyzed. Only child deaths occurring after 1975 (for graduate participants) and 1977 (for sibling participants) were included in analyses involving these three moderators. In each case, a series of hierarchical regressions was conducted in which depression scores on the CES-D, alcoholism symptoms, total number of illnesses, total psychological well-being scores, and total income were regressed

onto participant age, father's occupational status (only for financial outcomes), death of child status (comparison vs. death of child), and the moderator at the first step of the regression. The interaction term of death of child status by the moderator was entered at the second step. Separate analyses were conducted for men and women participants.

In the next set of moderation analyses, concurrent moderators were examined. All participants were included in these analyses, regardless of the year of the child's death. Of note, because the moderator variables were assessed at the same time as the outcome measures, this statistical plan is a weaker test of the putative causal model. That is, the moderators of presence of a friend or family member with whom to share private thoughts and feelings and purpose in life (Ryff scale) were collected at the same point in time as the outcome measures in 1992/94. Thus, it is difficult to determine the direction of any significant findings regarding these two moderating variables. The analytical approach was the same as the previous analyses. A series of hierarchical regressions was conducted in which depression scores on the CES-D, alcoholism symptoms, total number of illnesses, total psychological well-being scores, and total income were regressed onto participant age, father's occupational prestige (where appropriate), death of child status (comparison vs. death of child), and the relevant moderator at the first step of the regression. The interaction between death of child status and the moderator was entered at the next step. Again, separate analyses were conducted for men and women participants.

For ease of presentation, all findings have been organized by outcomes for each gender. Results have also been organized by the type of dependent variable used in analyses (e.g., continuous or dichotomous). The beta weights associated with each term from the final step of the regression equation are listed in Tables 6-10 for women and Tables 11-15 for men.

Table 6

*Unstandardized and Standardized Regression Weights for Interactions between Women's Bereavement and Religious Participation*

Outcome	B	SE of B	$\beta$
Depression	.46	1.32	.025
Alcoholism	.04	.06	.05
Psychological well-being	1.06	2.04	.04
Illnesses	.89	.13	.05
Income	1256.88	3627.05	.03

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 7

*Unstandardized and Standardized Regression Weights for Interactions between Women's Bereavement and Occupational Satisfaction*

Outcome	B	SE of B	$\beta$
Depression	-7.59**	2.92	-.16
Alcoholism	.04	.13	.02
Psychological well-being	-2.12	4.60	-.03
Illnesses	-.19	.29	-.04
Income	-148.82	8079.18	.00

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 8

*Unstandardized and Standardized Regression Weights for Interactions between Women's Bereavement and Visits with Friends*

Outcome	B	SE of B	$\beta$
Depression	-.10	.37	-.02
Alcoholism	.00	.02	-.02
Psychological well-being	-.73	.60	-.07
Illnesses	-.01	.04	-.01
Income	33.71	1094.01	.00

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 9

*Unstandardized and Standardized Regression Weights for Interactions between Women's Bereavement and Presence of Someone with whom to Share*

Outcome	B	SE of B	$\beta$
Depression	9.55*	5.01	.29
Alcoholism	-.37	.25	-.27
Psychological well-being	-7.76	5.52	-.14
Illnesses	-.65	.64	-.18
Income	-20949.51	15164.55	-.25

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 10

*Unstandardized and Standardized Regression Weights for Interactions between Women's Bereavement and Purpose in Life*

Outcome	B	SE of B	$\beta$
Depression	-.48**	.16	-.51
Alcoholism	-.01	.01	-.16
Psychological well-being	-.08	.17	-.05
Illnesses	.01	.02	.05
Income	78.20	455.75	.03

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 11

*Unstandardized and Standardized Regression Weights for Interactions between Men's Bereavement and Religious Participation*

Outcome	B	SE of B	$\beta$
Depression	1.50	1.05	.11
Alcoholism	.10	.07	.10
Psychological well-being	-3.15	1.89	-.13
Illnesses	.02	.12	.01
Income	5764.51	3255.96	.14

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 12

*Unstandardized and Standardized Regression Weights for Interactions between Men's Bereavement and Occupational Satisfaction*

Outcome	B	SE of B	$\beta$
Depression	-1.64	2.77	-.04
Alcoholism	-.15	.19	-.06
Psychological well-being	7.31	4.79	.11
Illnesses	.10	.31	.02
Income	8814.06	8347.26	.08

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 13

*Unstandardized and Standardized Regression Weights for Interactions between Men's Bereavement and Visits with Friends*

Outcome	B	SE of B	$\beta$
Depression	.39	.47	.06
Alcoholism	.00	.03	.00
Psychological well-being	-.62	.76	-.06
Illnesses	.01	.05	.02
Income	-1120.72	1096.64	-.09

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 14

*Unstandardized and Standardized Regression Weights for Interactions between Men's Bereavement and Presence of Someone with whom to Share*

Outcome	B	SE of B	$\beta$
Depression	-4.63	4.35	-.14
Alcoholism	.05	.35	.02
Psychological well-being	-1.94	5.53	-.04
Illnesses	1.04	.59	.27
Income	4260.24	14121.82	.05

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 15

*Unstandardized and Standardized Regression Weights for Interactions between Men's Bereavement and Purpose in Life*

Outcome	B	SE of B	$\beta$
Depression	-1.27**	.21	-1.33
Alcoholism	.01	.02	.15
Psychological well-being	.41	.23	.27
Illnesses	-.08**	.02	-.69
Income	-618.41	608.62	-.24

Values represent the interaction term at the second step of the analyses, \* significant at  $p < .05$ , \*\* significant at  $p < .01$



### Results for Women's Continuous Outcomes

When women's depression scores on the CES-D were regressed onto death of child status and job satisfaction in 1975/77, the interaction term significantly contributed to the prediction of depression scores. A simple effects analysis revealed that at one standard deviation above the occupational satisfaction mean, the slope of the regression equation was 1.77 and at one standard deviation below the mean the slope was 12.55. As predicted, there was a positive correlation between the loss of a child and depression for women with low job satisfaction. This relationship was much weaker in women with high occupational satisfaction. The number of visits with friends in 1975/77 and job satisfaction in 1975/77 did not significantly contribute to the prediction of women's depression scores. (See Tables 7 and 8.) When women's depression scores on the CES-D were regressed onto presence of a friend or family member with whom to share private thoughts and death of child status, the interaction term significantly contributed to the prediction of depression scores. The correlation coefficient for the relationship between death of child status and depression scores for women who reported that they did not have someone with whom to share was  $r(38) = -.11$ , ns. The correlation coefficient for the relationship between death of child status and depression for women who reported that they had someone with whom to share was  $r(779) = .17$ ,  $p < .01$ . Thus, there was a significant positive relationship between the loss of a child and depression scores for women who reported someone with whom to share. Contrary to expectations, this relationship was not present for women who reported that they did not have someone with whom to share.

When women's depression scores on the CES-D were regressed onto purpose in life scores and death of child status, the interaction term significantly contributed to the prediction of depression scores. A simple effects analysis revealed that at one standard deviation above the

purpose in life mean, the slope of the regression equation was 48.17 and at one standard deviation below the mean the slope was 59.78. Therefore, there was a stronger relationship between the loss of a child and depression in women with low purpose of life scores than for those with high purpose in life scores.

When total number of illnesses, total alcoholism symptoms, psychological well-being, and income were regressed onto women's visits with friends in 1975/77, job satisfaction, religious participation, presence of someone with whom to share private thoughts, purpose in life scores, and death of child status, the interaction terms failed to contribute significantly to the prediction. Again, refer to Tables 6-10 for relevant statistics (e.g., beta weights, standard error of beta) for current analyses.

#### Results for women's dichotomous outcomes

Next, the effects of the aforementioned moderators on the dichotomous outcome variables of presence of a depressive episode, presence of a reciprocal relationship with someone, and status of first/same marriage for women participants were assessed. Specifically, hierarchical logistic regressions were conducted with each outcome measure. In each case, age, death of child status, and the moderator of interest (visits with friends in 1975/77, job satisfaction in 1975/77, religious participation in 1975/77, presence of someone with whom to share private thoughts in 1992/94, and purpose in life scores in 1992/94) were entered at the first step. The interaction term of each moderator and death of child status was entered at the second step. As described earlier, the analyses involving the moderators visits with friends in 1975/77, job satisfaction in 1975/77, and religious participation in 1975/77 included all non-bereaved participants and participants who lost a child after 1975/77. All participants were included in the analyses involving purpose in life and presence of someone with whom to share.

The interaction terms of the examined moderators did not reliably predict the presence of a depressive episode, presence of a reciprocal relationship, or status of first/same marriage.

Parameter estimates are presented in Tables 16-20.

#### Results for men's continuous outcomes

With regard to men participants' mental health outcomes, the moderators of number of visits with friends in 1975/77, religious participation in 1975/77, and job satisfaction in 19975/77 did not significantly contribute to the prediction of men's depression scores. See Tables 10-14.

When men's depression scores on the CES-D were regressed onto purpose in life scores and death of child status, the interaction term significantly contributed to the prediction of depression scores. A simple effects analysis revealed that at one standard deviation above the purpose in life mean, the slope of the regression equation was -20.90 and at one standard deviation below the mean the slope was 13.82. Therefore, as expected, there was a positive correlation between the loss of a child and depression for men with low purpose in life scores. In contrast, there was a negative relationship between the loss of a child and depression for men with high purpose in life scores.

The presence of someone with whom to share private thoughts did not significantly contribute to the prediction of depression scores (see Table 14).

With regard to men's physical health outcomes, the moderators of number of visits with friends in 1975/77, religious participation in 1975/77, and job satisfaction in 19975/77 did not significantly contribute to the prediction of men's total number of illnesses. When men's total number of illnesses was regressed onto purpose in life scores and death of child status, the interaction term significantly contributed to the prediction of number of illnesses. A simple effects analysis revealed that at one standard deviation above the purpose in life mean, the slope

Table 16

*Logistic Regression Weights for Interactions between Women's Bereavement and Religious Participation*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.09	.10	.73	1.09
Reciprocal relationship	.04	.10	.14	
1.04Marriage status	.20	.18	1.22	
1.22				

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 17

*Logistic Regression Weights for Interactions between Women's Bereavement and Occupational Satisfaction*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.37	.46	.64	1.44
Reciprocal relationship	-.05	.43	.12	.86
Marriage status	-.13	.47	.08	.88

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 18

*Logistic Regression Weights for Interactions between Women's Bereavement and Visits with Friends*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	-.03	.05	.34	.97
Reciprocal relationship	-.09	.05	3.17	.92
Marriage status	-.08	.07	1.13	.93

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 19

*Logistic Regression Weights for Interactions between Women's Bereavement and the Presence of Someone with whom to Share*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.02	.02	.55	1.02
Marriage status	.49	1.2	.16	1.38

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 20

*Logistic Regression Weights for Interactions between Women's Bereavement and Purpose in Life*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.23	1.01	.05	1.25
Reciprocal relationship	.00	.02	.00	1.00
Marriage status	-.02	.03	.63	.98

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

of the regression equation was -11.50 and at one standard deviation below the mean the slope was -9.31. Therefore, there was a slightly stronger negative relationship between the loss of a child and number of illnesses for men who reported high purpose in life scores than for men who reported low purpose in life scores.

When total alcoholism symptoms, psychological well-being, and income were regressed onto men's visits with friends in 1975/77, job satisfaction, religious participation, presence of someone with whom to share private thoughts, purpose in life scores, and death of child status, the interaction terms failed to contribute significantly to the prediction. See Tables 11-15 for beta weights associated with the last step of the regression equation for relevant analyses.

#### Results for men's dichotomous outcomes

Next, the effects of the aforementioned moderators on the dichotomous outcome variables of presence of a depressive episode, presence of a reciprocal relationship with someone, and status of first/same marriage for men were assessed. Specifically, hierarchical logistic regressions were conducted with each outcome measure. In each case, age, death of child status, and the moderator of interest (visits with friends in 1975/77, job satisfaction in 1975/77, religious participation in 1975/77, purpose in life scores, and death of child status) were entered at the first step. The interaction term of each moderator and death of child status was entered at the second step. For the analyses involving the moderators visits with friends in 1975/77, job satisfaction in 1975/77, and religious participation in 1975/77, the participants included were the non-bereavement group participants and participants who lost a child after 1975/77. All participants were included in the analyses involving purpose in life and presence of someone with whom to share.

Results indicate that the interaction between religious participation in 1975/77 and death of child status was a significant predictor of marital status (intact or not intact) of the men's 1975/77 marriage ( $B = -.44, p < .05$ ). Men who reported low levels of religious participation (defined as 1 SD below the mean) exhibited a non-significant relationship between death of child status and the status of their first marriage ( $\rho = -.04, ns$ ). As expected, for men who reported high levels of religious participation (defined as 1 SD above the mean), the loss of a child was associated with slightly higher rates of intact first marriages ( $\rho = .11, ns$ ).

Results indicate that the examined moderators did not predict the presence of a depressive episode, presence of a reciprocal relationship, or status of first/same marriage for men. Parameter estimates are presented in Tables 21-25.

Effect of presence of other children and births of children after the death on bereaved participants' outcomes

The presence of another child at the time of the death and the birth of a new child after the death of the child were expected to be protective factors that were predicted to have positive main effects within the bereaved groups. Because the presence of another child at the time of the death and the birth of a new child after the death of the child were only relevant for the participants who lost a child, the following analyses concerned only the bereaved participants (i.e., not the comparison group). Specifically, the relevant outcome measure was regressed on participant age in 1992, father's occupational status (for analyses involving income), presence of other children in the home at the time of the death (coded 0 or 1) and birth of a new child after the death (coded 0 or 1).

The presence of other children at the time of death significantly predicted men's total income,  $r(227) = .16, p < .05$ . This finding indicates that the presence of other children was related



Table 21

*Logistic Regression Weights for Interactions between Men's Bereavement and Religious Participation*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.01	.16	.07	1.01
Reciprocal relationship status	-.09 -.44	.12 4.87*	.64 .65	.91 Marriage

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 22

*Logistic Regression Weights for Interactions between Men's Bereavement and Occupational Satisfaction*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	-.12	.57	.04	.89
Reciprocal relationship	.42	.43	.91	1.52
Marriage status	.06	.52	.01	1.06

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 23

*Logistic Regression Weights for Interactions between Men's Bereavement and Visits with Friends*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	-.02	.07	.07	.98
Reciprocal relationship	.04	.08	.25	1.04
Marriage status	-.05	.07	.48	.96

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 24

*Logistic Regression Weights for Interactions between Men's Bereavement and the Presence of Someone with whom to Share*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.83	.87	.92	2.30
Marriage status	-.57	.93	.37	.57

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 25

*Logistic Regression Weights for Interactions between Men's Bereavement and Purpose in Life*

Outcome	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.08	.04	5.15	1.08
Reciprocal relationship	.01	.03	.08	1.01
Marriage status	-.03	.03	1.71	.97

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

to higher income for men who lost a child. Presence of other children did not predict women's income. Further, the presence of another child at the time of the death nor the birth of a new child after the death of the child did not significantly predict depression scores, number of illnesses, psychological well-being, or alcoholism symptoms for women or men. These analyses are presented in Tables 26-27 (women) and Tables 28-29 (men).

Logistic regression analyses were performed with episode of depression in adulthood, presence of a reciprocal relationship with someone, and status of marriage to 1<sup>st</sup>/same spouse as outcomes. Again, the presence of other children at the time of the death and the birth of a new child after the death were selected as predictor variables. Consistent with the hypothesis that having another child will have protective effects, the birth of another child after the death of a child was significantly related to the absence of a depressive episode for women ( $B = -.62$ ,  $p < .05$ ). Contrary to expectations, results indicated that presence of other children at the time of the death was associated with a no longer intact first marriage for women ( $B = -.95$ ,  $p < .01$ ). Finally, results indicated that presence of other children at the time of the death was associated with the absence of a reciprocal relationship with family or friends for women ( $B = -.56$ ,  $p < .05$ ).

The presence of other children and the birth of a new child did not predict the presence of a depressive episode, the presence of a reciprocal relationship with others, or the status of the same/first marriage for men. Parameter estimates are presented in Tables 30-31 for women and Tables 32-33 for men.

Table 26

*Unstandardized and Standardized Regression Weights for Interactions between Women's Bereavement and Presence of Other Children*

Other Children	B	SE of B	$\beta$
Depression (CES-D)	1.52	1.95	.04
Illnesses	-1.1	.21	-.03
Psychological Well-being	-1.98	2.79	-.03
Alcoholism	.00	.08	.00
Income	-1503.94	3547.45	-.02

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 27

*Unstandardized and Standardized Regression Weights for Interactions between Women's Bereavement and Presence of New Births*

New Births	B	SE of B	$\beta$
Depression (CES-D)	-1.76	2.07	-.05
Illnesses	-.04	.23	-.01
Psychological Well-being	-.27	2.99	.00
Alcoholism	.06	.08	.04
Income	393.45	3651.42	.01

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 28

*Unstandardized and Standardized Regression Weights for Interactions between Men's Bereavement and Presence of Other Children*

Other Children	B	SE of B	$\beta$
Depression (CES-D)	-5.07	2.84	-.13
Illnesses	-2.06	.31	-.05
Psychological Well-being	1.11	3.58	.02
Alcoholism	-.25	.15	-.11
Income	18210.64**	5168.50	.22

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 29

*Unstandardized and Standardized Regression Weights for Interactions between Men's Bereavement and Presence of New Births*

New Births	B	SE of B	$\beta$
Depression (CES-D)	3.92	3.04	.09
Illnesses	.02	.33	.00
Psychological Well-being	-.63	3.88	-.01
Alcoholism	.02	.16	.01
Income	3835.13	5436.90	.04

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 30

*Logistic Regression Weights for Interactions between Women's Bereavement and Presence of Other Children*

Other Children	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.32	.25	1.63	1.37
Reciprocal relationship	-.56	.25	4.90*	.57
Status of marriage	-.95	.28	11.11**	.39

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 31

*Logistic Regression Weights for Interactions between Women's Bereavement and Presence of New Births*

New Births	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	-.62	.28	4.71*	.54
Reciprocal relationship	.24	.26	.84	1.27
Status of marriage	-.20	.31	.38	.82

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 32

*Logistic Regression Weights for Interactions between Men's Bereavement and Presence of Other Children*

Other Children	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.52	.41	1.63	1.69
Reciprocal relationship	.17	.31	.30	1.18
Status of marriage	-.12	.39	.10	.89

\* significant at  $p < .05$ , \*\* significant at  $p < .01$

Table 33

*Logistic Regression Weights for Interactions between Men's Bereavement and Presence of New Births*

New Births	B	SE(B)	Wald	Exp(B)
Depression (yes/no)	.06	.40	.02	1.06
Reciprocal relationship	.45	.33	1.84	1.57
Status of marriage	-.01	.39	.00	1.00

\*significant at  $p < .05$ , \*\* significant at  $p < .01$



## Chapter 4

### Discussion

The current study aimed to examine the long-term effects of a death of a child on a variety of parental psychological and physical outcomes, bring to bear several methodological and conceptual innovations over previous research. Prior bereavement research typically has focused on functioning within a short time period after the death and often utilizes self-selected samples of grieving parents. However, many current theorists (e.g., Murphy, et al., 2002) suggest that conceptualizations of the grieving process do not consider the longer-term effects of grief and thereby may misrepresent the manner in which people actually grieve. In contrast, this study broadened the timeframe in which bereavement is studied, and also studied a sample of bereaved parents who were not self-selected. The current study considered unresolved grief as a form of PTSD, which served as a conceptual model for the psychological and physical process of grieving the loss of a child. Finally, the current study examined potential factors promoting resiliency and good psychological adjustment after the death of a child in addition to examining negative outcomes.

The present study provides partial support for the expected associations among the experience of a death of a child, negative mental and physical health, and lower financial achievement. There is partial evidence for the role of purpose in life, religious participation, the presence of someone with whom to share private thoughts, and job satisfaction as moderators in these associations. However, this support is limited and restricted to only some circumstances.

The first hypothesis proposed that parents who experienced the death of a child would have higher levels of mental and physical distress, lower levels of psychological well-being, lower levels of social participation and social support, and lower financial achievement than non-bereaved parents from similar backgrounds. Concordant with expectations, bereavement status significantly predicted depression scores (as assessed by the CES-D). Parents who lost an infant, adolescent, or adult son or daughter, and parents reporting no age of child death were more depressed than their non-bereaved peers. This is commensurate with prior research stating that the death of a child increases parents', especially mothers', risk for psychiatric hospitalization (Li, Laursen, Precht, & Mortensen, 2005). These authors found that mothers were at highest risk for hospitalization secondary to a mood disorder in the first year after the death; however, risk was significantly elevated for 5 or more years after the death. In the current study, the bereaved parents scored higher on a measure of depression than their non-bereaved peers, but they did not exhibit higher levels of clinical depression. It may be the case that the death of a child serves as the trigger for a major depressive episode among people who are vulnerable to depression (hence the higher rates noted by Li, et al., 2005). Of note, current depression scores were collected years after the loss. Perhaps over many years, other individuals with vulnerabilities to depression who did not lose a child experienced other triggers of depression (e.g., stressful life events such as illness, financial difficulties) and thereby developed major depression later in life. Thus, lifetime depression rates of bereaved and non-bereaved individuals do not differ significantly. Additionally, there may be some hindsight bias in reporting in that bereaved parents who are not currently clinically depressed underestimate their depressive symptoms in other points in time (i.e., directly after the death). Alternatively, the current results may be interpreted to suggest that the event of the loss of a child produces lower grade depression over

extended periods of time, possibly more of a dysthymic state. This emotional state may be best characterized as longstanding dysphoria caused by a negative cognitive style that developed after the death of a child. After this experience, bereaved parents may be tentative about other attachments in their lives and therefore they are less willing to invest in other relationships. This general sense of malaise leads to a negative worldview that colors their experience even decades after the event of the death of a child. Therefore, the depression is not due to a preoccupation with the death per se, but rather due to the negative adaptations (e.g., negative cognitive style) one adopts after this event.

Bereavement status significantly predicted purpose in life scores. All subgroups of bereaved parents reported higher purpose in life scores than non-bereaved parents. Although it appears that the experience of bereavement is psychologically scarring (e.g., higher depression scores), there appear to be some positive outcomes as well. Developing an increased sense of purpose in life may be viewed as a form of psychological growth. Qualitative literature suggests that the event of the death of a child may be conceptualized as a crisis of meaning (Wheeler, 2001). In this vein, searching for meaning in the event is a crucial step towards psychological healing (Klass, 1999). After the death of a child, previously held beliefs regarding purpose in life and goals may seem irrelevant and pointless. The resulting emptiness has been described by Frankl (1978) as an “existential vacuum”. Theorists propose that one’s original views (i.e., purpose and goals) were learned and shaped by life experiences. Thereby, over time bereaved parents slowly develop new meaning and purpose in life (Wheeler, 2001). This renewed investment may in fact be a sign of recovery after grieving the loss of a child. Further, bereaved parents may be more introspective with regard to defining their sense of purpose in life

compared to non-bereaved parents who presumably did not experience a similarly traumatic experience.

Bereavement status significantly predicted incomes in 1992/94. Parents who lost an infant, adolescent, adult, and the parents who did not report a date of death had lower incomes than the comparison group. Of note, although the current sample was matched on pre-parenthood socioeconomic variables, the bereaved participants' families of origin were of lower socioeconomic status than the general WLS population. It is possible that lower income is a risk factor for child death. Families of lower socio-economic status likely have poorer access to health care and other factors associated with good health (e.g., proper nutrition). Further, there is evidence that lower income is associated with trauma exposure such as the death of a friend or family member (Rheingold, Smith, Ruggiero, Saunders, Kilpatrick, & Resnick, 2004). This suggests that the bereaved parents were at higher risk for trauma exposure due to their lower income status. Alternatively, it may be the case that individuals who lost a child become lower wage earners as a result of experiencing this loss. Further, the comparison group received more education than their bereaved peers, and thus may have earned more as a direct result of more education. There are multiple possible mechanisms for the observed effect. For example, perhaps caring for a sick child and/or going through the grief reaction after the death of a child led bereaved parents to be less productive at work. These individuals may be less motivated to obtain more education as adults as well. Less productivity and less education likely lead to fewer advancements at work (i.e., promotions and raises), thus explaining the observed lower income in midlife for bereaved parents. A final view is that lower income has unique meaning for bereaved individuals. When a parent experiences this horrific event, one may reprioritize goals and thus shift the way in which one's time is spent. Specifically a bereaved parent may

make the decision to spend less time focusing on career (i.e., reducing earning power) in lieu of spending more time with remaining family members. However, current data do not support this explanation.

The group of individuals who lost an adult child exhibited a greater number of predicted deficits than other groups of bereaved parents. In addition to scoring higher on measures of depression, these parents had jobs that were lower on the occupational prestige scale than the comparison group. Further, these bereaved parents of adult children were also more likely to be divorced than the non-bereaved parents. Current findings suggest that this group is lower achieving in multiple areas than other participants. As such, there may be psychological and economic factors that are unique to parents who lose an adult child. It might be the case that the types of death experienced by this group are different than the other groups. Although this possibility cannot be confirmed in the current study, several explanations for the observed effects may be offered. For example, previous research suggests that parents of children with longer lasting terminal illnesses report more anger and hostility than parents of children with shorter illnesses (Rando, 1983). It stands to reason that children with longer illnesses are generally older than children with shorter courses of illness. Thus, if a parent loses an adult child to a longstanding illness, their reaction may include more complicated reactions (e.g., intense anger). Additionally, adult children may be more likely to die by suicide or homicide than younger children because of their higher levels of autonomy and ability to make lifestyle choices. It is well documented that complicated bereavement (e.g., worse psychological and psychosocial outcomes) frequently follows these types of deaths (Kovarsky, 1989; Seguin, Lesage, & Kiely, 1995). For instance, parents who lost a child to a suicide death report lower levels of social support, more guilt, shame and depression than parents of children who died in other ways

(Seguin, Lesage, & Kiely, 1989). An alternative hypothesis concerns the age of the parents as well. Because of the parent's own advancing age, they are less likely than younger bereaved parents to have additional children or restructure their existing family. Perhaps this inability to rebuild a family compounds their problems. Current data suggests that having a new child is associated with lower rates of depression, at least for mothers. Therefore, when examining the changes that occurred as a result of the stressful event of the death of a child, normative life-course changes may be contributing to problems in an additive manner. Alternatively, parents who lose an adult child may be representative of families with pre-existing risk factors (e.g., psychological dysfunction, lower income). For example, if these families are from lower socioeconomic strata, the risk of premature death is likely higher than for other families.

In contrast to the adult death group demonstrating the most problems, the infant death group reported the smallest number of problems. Generally, these parents were younger at the time of death, so perhaps their relative resilience is a function of their age. Younger adults generally have fewer health problems, and in most cases, these younger parents were physically able to have additional children. Additionally, it is likely that the younger adults are working in addition to raising a family. Because of their relative health and vigor, they can participate actively in more organizations, etc. As such, role variegation may be a protective factor for these younger bereaved adults. In the current sample, there was a significant age effect for the presence of a reciprocal relationship with anyone  $F(1,1283)= 4.98, p<.05$ . Younger adults were more likely to report having reciprocal relationships. This is consistent with Folkman's (1991) finding that younger adults seek out more social support and active problem solving when coping with adversity than older adults. Of note, the participants in Folkman's sample were presumably older than the current infant death group (e.g., 44-74); however, the observed age trend may still

be relevant. In sum, the younger bereaved parents may have activated more effective coping strategies, which thereby decreased their risk for negative psychological sequelae secondary to the loss of a child.

Bereavement status was not a significant predictor of a number of variables that were expected to be adverse outcomes. With regard to mental health outcomes, bereavement status did not significantly predict alcoholism symptoms. This finding is promising in that it suggests that parents who lose a child do not necessarily choose alcohol consumption as a coping strategy. It is not known from the present study if bereaved parent's alcohol consumption increases in the short-term; however, the current findings suggest that alcohol use is not causing long-term difficulties in this group. Bereavement status also did not predict lower levels of autonomy, environmental mastery, positive relations with others, personal growth, self-acceptance, and total psychological well-being; factors that are considered indicative of psychological well-being. These dimensions are based on theoretical suppositions of optimal aging, positive functioning, and normal human development (Ryff, 1989b). Again, from a clinical perspective, it is promising to see that bereaved parents do not show lower scores on such measures than non-bereaved parents.

Similarly, contrary to predictions, bereavement status also did not predict negative physical health outcomes. Specifically, bereaved parents did not demonstrate higher numbers of total diagnosed illnesses or total number of physical symptoms. They did not have lower perceived current health or lower perceived health compared to their peers. Prior research has indicated that a link exists between these bereavement and negative health consequences (Parkes, 1996). For example, in one study bereaved parents were found to have higher rates of cancers affecting the neuroendocrine and immune systems (Levav, et al., 2000). As described earlier, the

negative impact of psychological and physiological stress on the central nervous system and the immune system is well documented (Southwick, Yehuda, & Charney, 1997; Charney, et al., 1993). Specifically, disruption of the HPA axis (Bremner, Southwick, Charney, 1999) and over production of norepinephrine (Petty, et al., 1993) have been offered as casual mechanisms for this effect. It is surprising that bereavement did not affect health outcomes in the current study. The most salient explanation for this non-effect is that the current study implemented insensitive measures. Much of the existing research utilizes sophisticated technology such as electrophysiological measures or lab work collecting and measuring neurochemical levels, etc. Perhaps the measures of perceived physical health and number of diagnosed illnesses are too gross to capture more subtle physiological problems. Additionally, it may be the case that these problems are only relevant for bereaved parents who endorse other problems, such as depression. Therefore, it would be interesting for future research to continue to examine health outcomes in the depressed bereaved parents over time.

With regard to social participation, bereavement status did not significantly predict total number of organizations to which one belongs, the number of visits with one's family or friends, total help given to family and friends, total help received from family and friends, the presence of someone with whom to share private thoughts or feelings, or the presence of a reciprocal relationship with others. Most individuals in the current sample reported the presence of some form of social support. Therefore, the lack of variance in these variables may partially explain current findings. Alternatively, there may be mixed reactions to bereavement. Some bereaved parents may seek out friends or organizations for social support, whereas others may be more avoidant of social interactions. If both trends occurred simultaneously in this sample, then the overall effect was insignificant because, as it were, the two trends cancelled each other.



The second hypothesis stated that various support systems (e.g., religious participation, the number of visits with friends, and the presence of a friend or family member with whom to share private thoughts) and other positive life circumstances (e.g., high job satisfaction and high purpose in life scores) would moderate the relationship between the experience of a death of a child and negative mental and physical health and financial achievement (specifically depression scores on the CES-D, presence of a depressive episode, total number of illnesses, total alcoholism symptoms, psychological well-being, total income in 1992/94, the presence of a reciprocal relationship with anyone, and marriage to first/same spouse in 1992/94). The prediction was that the event of a death would have a stronger negative impact on parents with lower levels of the moderating variables. These analyses were conducted independently for men and women participants. Results for women participants will be discussed first.

As with the main effects analyses, the depression measure was the most sensitive to the moderation effects of all outcomes examined. Consistent with expectations, job satisfaction moderated the relationship between the death of a child and depression for women. Specifically, there was a stronger positive relationship between death of a child and depression for women who reported lower job satisfaction. This lends support the notion that role variegation (i.e., multiple meaningful roles in life) may buffer the negative effects of losing a child. The protective effects of role variegation with regard to psychological resilience in women is well documented (Moen, 1997). Thus, women with high job satisfaction were protected from depression, whereas women with low job satisfaction were more vulnerable to depression.

The presence of someone with whom to share private thoughts and feelings moderated the relationship between death of a child and depression in women. However, the interaction was not consistent with expectations. Women who reported having someone with whom to

share had a significant positive relationship between the death of a child and depression. That is, having someone with whom to confide not only did not buffer the mothers from depression, but may have placed them at a higher risk for depression. Alternatively, perhaps the depressed bereaved women reached out to friends more than non-depressed bereaved women. Thus, if a mother was not able to handle her grief alone, she turned to friends for ongoing support. However, this form of coping, emotional ventilation, may actually sustain grief/depression if utilized over an extended time period. Thus, contrary to expectations, reaching out to friends may be a marker of depression for some bereaved mothers.

As expected, purpose in life moderated the relationship between death of a child and depression for women. Women with low purpose in life scores demonstrated a strong positive relationship between the death of a child and depression. This trend was not evident in women with high purpose in life scores. Thus, it appears as though having a sense of purpose in life protects bereaved women from depression. Of note, the purpose in life and depression measures were collected simultaneously. A sense of higher purpose in life may be an effect of the event of a loss of a child; i.e., the finding suggest that developing a sense of purpose in life is an effective form of coping with grief and may be rather normative. When bereaved mothers do not experience this existential growth, they are more vulnerable to depression. On the other hand, women who are vulnerable to depression in general and experience the death of a child may be less likely to engage in this form of cognitive coping as it may run counter to a depressogenic cognitive style. In summation, current depression findings suggest that finding a purpose in life appears to be a good way of coping with the death of a child whereas relying on friends may be problematic.

In contrast to the findings described above, no further support of the second hypothesis was found when examining women's data. No other moderators significantly affected the relationship between the death of a child and outcome measures. Specifically, the moderators of religious participation, the number of visits with friends, presence of someone with whom to share private thoughts, job satisfaction, and purpose in life did not affect the relationship between the experience of death and the presence of a depressive episode, total number of illnesses, total alcoholism symptoms, psychological well-being, total income in 1992/94, the presence of a reciprocal relationship with anyone, and status of the marriage to first/same spouse in 1992/94. Of note, bereavement did not produce a main effect on most of the aforementioned variables suggesting that there may not be a strong link between bereavement and the listed outcomes.

For the men, purpose in life appeared to protect against depression and number of illnesses. Consistent with expectations, purpose in life moderated the relationship between the death of a child and depression (as assessed by the CES-D). As with women, there was a statistically significant positive relationship between the event of the death of a child and depression for men who reported a lower sense of purpose in life. This relationship was not as strong in men who scored higher on the purpose in life measure. Purpose in life moderated the relationship between the death of a child and total illnesses. Consistent with expectations, men with a higher reported sense of purpose in life had a stronger negative relationship between the death of a child and total number of illnesses. This relationship was not as strong in men who scored lower on the purpose in life measure. Current data suggest that this form of coping with grief (i.e., developing a higher sense of purpose in life) is associated with fewer illnesses in men.

Contrary to predictions, the variables of number of visits with friends, religious participation, occupational satisfaction, and the presence of someone with whom to share private

thoughts and feelings did not moderate the relationship between the death of a child and depression, as measured by the CES-D.

Consistent with expectations, religious participation moderated the relationship between the death of a child and the status of men's first/same marriage. Men who reported higher levels of religious participation were more likely to report that their original marriage was intact than men who reported lower levels of religious participation. Overall, people who self-identify as religious get divorced at lower rates than individuals who do not. For example, Heaton and Cornwall (1989) found that people with no religious affiliation were more likely to get divorced than people who identified with 20 different major religions. The mechanism for this effect is unknown. Religious participation may be viewed as a form of social support, therefore it may be the case that this increased social support helped to keep marriages intact. Additionally, if spouses participate in religious activities together and perceive this as a way to connect with each other, this practice may strengthen the marital bond. Finally, perhaps religious individuals are less likely to consider divorce as a viable option, especially if it is contraindicated in religious texts. No other examined variables (i.e., number of visits with friends and family, occupational prestige, purpose in life, and the presence of someone with whom to share) moderated the relationship between the death of a child and the status of the first/same marriage.

There was limited support for the hypothesis that the presence of other children in the home at the time of the death would be a protective factor that would decrease the negative impact of the death. For women, the presence of other children in the home was associated with the status of the first/same marriage; however, the association was not in the predicted direction. Women with other children in the home were more likely to be divorced than women without other children. Likewise, women with other children in the home at the time of the death were

more likely to not have reciprocal relationships than women with fewer children in the home at the time of the death. Therefore, having other children in the home did not appear to be a protective factor for mothers. This is consistent with Nelson and Frantz's (1996) findings that parents in larger homes reported more feelings of estrangement than parents of smaller households. As such, one explanation for the current finding is that bereaved women with larger households felt overburdened. These women have more children to take care of, and therefore they may not have the time or energy needed to work through their own grief after the death of a child or to resolve marital problems.

With respect to the impact of the birth of a child on women's outcomes, the presence of a new birth was associated with lower rates of reported depressive episodes for women. Thus, as expected, having another child seems to decrease women's chance of reporting depressive symptomatology. As mentioned earlier, depression appears to be the main variable that differentiated bereaved and non-bereaved women, and therefore it may be the most sensitive measure used in the current study.

With regard to men, the presence of other children in the home at the time of the death was associated with higher incomes. Therefore, despite having more children to care for, these fathers earned higher incomes. Current data do not suggest that larger families and associated higher income are normative. The correlation between income and total number of children for the comparison group was nonsignificant,  $r(246) = -.02$ , ns. The bereaved fathers in the current sample appeared to be successful in at least one respect (i.e., financial success) although they have experienced the negative event of the death of a child. Thus, bereaved fathers may immerse themselves in work as a coping strategy and they make more money as a result. Likewise, Forrest, Standish, and Baum (1982) found that fathers engaged in increased involvement in

activities outside of the home after the death of a child and therefore “kept busy” as a means of coping with their grief. Contrary to expectations, the birth of a new child after the death of a child was not significantly associated with any outcomes for men.

There are a number of limitations to this study to consider in evaluating the results. A primary consideration is that the cause of death is unknown. Literature suggests that outcomes may vary based on the cause of death. For example, Rinear (1987) found that parents of murdered children meet diagnostic criteria for mental disorders more so than children of accidental deaths. Intuitively, it appears as though the grieving process will be somewhat different based on the cause of death (e.g., parents of a child with a prolonged illness may prepare for the event in some manner whereas parents’ of children who die of suicide may not have prior knowledge of the impending death).

Another limitation is that the child age range may have been too wide. The event of the death of a younger child may be different from the event of the death of an older child in fundamental ways. For example, younger children may die more frequently from childhood illnesses than older children. Despite this limitation, age was considered in the present analyses as the children were grouped based on their age at the time of death, where possible. Additionally, there may have been age by cause of death interactions that were not possible to address within the current design (e.g., no knowledge of cause of death).

Another limitation of the current study is that several moderating variables (e.g., purpose in life) were collected after the death of some of the children and simultaneously with the outcome measures. Thus, the current methodology does not account for the possible bi-directional influences regarding the relative contributions of purpose in life to mental and physical health outcomes.

Finally, the current sample is a cohort and as a result there may be features of this group that are unique only to this group. Historical contexts in which individuals are born and through which they age invariably shape the course of their lives (Pearlin, Skaff, & McKean, 1996). Thus, these historical circumstances around one's life may produce differences in values, beliefs, and life trajectories. The current sample consists of individuals who aged during times of political and social upheaval (e.g., 1960's civil rights movement, Vietnam conflict, etc.). These socio-political events likely influenced these individual's worldviews.

Minorities are not represented in the WLS due to the low numbers of minorities living in Wisconsin at the study's beginning. Further, about 19% of the sample grew up on a farm. While this figure is consistent with national estimates for cohorts from the late 1930's, this limits the generalizability of the sample.

Of note, the current study proposed a framework conceptualizing bereavement as a form of PTSD. This model suggested that bereaved individuals would experience higher numbers of physical illness and somatic complaints based on physiological disruptions analogous to those observed in individuals with PTSD; however, these predicted effects were not observed. As noted earlier, this may be due to the insensitivity of current measures of physical dysfunction. In contrast, the pathognomonic symptoms of PTSD (e.g., avoidance, intrusive thoughts, hypervigilance) were not assessed in the current study. Thus, the prevalence rate of PTSD within the bereaved sample was not determinable. Therefore, while this conceptual model was interesting from a theoretical perspective, it did little to add to the predictive power of examined variables (e.g., bereavement).

Although the current study yielded mixed results, the long-term effects of the death of a child on mental and physical health and financial outcomes merits more attention. This

investigation has shown that bereaved parents report more depression, lower incomes, and higher sense of purpose in life than their non-bereaved peers. There is some support of the role of religious participation, the number of visits with friends, the presence of a friend or family member with whom to share private thoughts, job satisfaction and purpose in life as moderating the relationship between the death of a child and outcomes (e.g., depression, total number of illnesses, status of one's marriage). The exact nature of this relationship is not yet understood, and future research should focus on illuminating the mechanisms of transmission by which this process occurs. This knowledge would guide intervention design, which would be useful to a wide array of clinicians, as the death of a child is unfortunately a common event.



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