

Effects of Parental or Caregiver Death Prior to Age Eighteen  
on Depressive Symptoms and Grief Following Miscarriage

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Submitted in partial fulfillment of the requirements for the degree of Doctor of  
Philosophy under the Executive Committee of the Graduate School of Arts and Sciences

COLUMBIA UNIVERSITY

2011

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## ABSTRACT

### Effects of Parental or Caregiver Death Prior to Age Eighteen on Depressive Symptoms and Grief Following Miscarriage

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Parental or caregiver death, especially in childhood, can have long lasting emotional ramifications in an individual's life. When this early loss is followed by significant life events such as pregnancy, and losses such as miscarriage, the bereaved woman experiences considerable emotional impact.

The present study explores the relationship between parental or caregiver death and miscarriage on depressive symptoms and grief. Specifically, the study examines whether a history of parental or caregiver death affects depressive symptoms and grief following miscarriage such that miscarrying women with parental or caregiver death have higher levels of depressive symptoms and grief than their counterparts who have not experienced parental or caregiver death. The study further examines whether the difference in the level of depressive symptoms between miscarrying women with and without a history of parental or caregiver death is greater than the difference in the level of depressive symptoms between pregnant and non-pregnant/community women with and without a history of parental or caregiver death.

Results indicate that miscarrying women who have suffered parental or caregiver death experience more depressive symptoms than miscarrying women who have not suffered parental or caregiver death; pregnant women who have suffered parental or

caregiver death prior to age eighteen experience more depressive symptoms than pregnant women who have not suffered parental or caregiver death prior to age eighteen. However, the difference in the level of depressive symptoms in miscarrying women with and without a history of parental or caregiver death is not greater than the difference in the level of depressive symptoms in pregnant and non-pregnant/community women with and without a history of parental or caregiver death. No association was found between parental or caregiver death and grief in miscarrying women. Results are discussed in the context of psychodynamic, relational, and attachment-based explanatory models.

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## ACKNOWLEDGMENTS

This dissertation bears my name on it. I frequently refer to it as “my dissertation.” And yet, it was not the product of my labor alone. Dissertations are like children in that sense. Just as it takes a village to raise a child, it takes a team of people to see a dissertation from a mere thought to a completed product.

I owe a huge debt of gratitude to all the incredible individuals who supported me through the long process that led to this moment. This section is my humble attempt at a vote of thanks.

I was privileged to have the guidance of several mentors, teachers, and supervisors during this long process. Dr. Lena Verdeli, thank you for kindness, and patience in listening to my research ideas and instantly knowing whom I should approach for mentorship. Dr. Richard Neugebauer, thank you for your incredible brilliance, your statistical savvy, and your inspirational grasp of research methods. I could not have done any of this without your support. I truly appreciate that you went through every number in every table; it went miles in bolstering my confidence. Dr. Barry Farber, thank you for your understanding. You provided structure while also allowing for flexibility at a time when I needed both. Dr. Lisa Miller, thank you for agreeing to chair my dissertation committee at such short notice; I found your patient smile to be a source of valuable strength. Dr. Laura Smith, thank you for making yourself available in the summer time (also at short notice) for proposal, data hearing, and defense. Your kind eyes and warm smile, coupled with your encouraging comments consistently delivered a dose of

confidence. Dr. Katherine Shear, thank you for sharing your expertise as the fifth member of my committee.

I did not hire a statistician to help with my dissertation. Do not be fooled; it is not because I am a statistics whiz. Rather, it is because I was lucky enough to have the invaluable friendship of a statistics whiz. Monica Ghailian, you are an incredible human being! I cannot thank you enough for the hours that you spent going over my research design, ensuring data integrity, scoring measures, statistical analyses, and the list goes on... Of course I will never forget the innumerable times that you took the train into Queens to help me with my analyses so that I did not have to travel in my third trimester. You are amazing, and I am eternally grateful.

I have been blessed with great friends and family. I talked your ears out about my dissertation and other graduate school related matters on several occasions. Thank you for your patience and love. In alphabetical order, thank you: Aarati, Bobby, Fatin, Mia, Nancy, Nidhi.

Last but not least, none of this, not the dissertation and definitely not the Ph.D., would have happened without the support and love of my family. Appa and Amma, you gave me everything I have, and that definitely includes this education. I owe you my life and much more. Thank you for encouraging me to follow my dreams. Vaibhav, marrying you was the best decision of my life. You put up with a lot of anxiety, agitation, frustration, and drama through these long years. Thank you for believing in me. I am definitely not as resourceful as you, and would not have done half of this had it not been for your active involvement and encouragement. Ananya, you are my world. Thank you for graciously fielding an anxious mother in your very first year of life. You are already a

pro! You inspire me everyday. Your warm smile and unconditional love is my biggest accomplishment. As you grow older, I know our relationship will continue to evolve and change. Through it all, I hope that you can know (and I can convey) that everything that I do, I do it to be a better mother to you.

Thank you to all of you for being a part of my dissertation, and part of my life.

## DEDICATION

To my family, Appa, Amma, Vaibhav, and Ananya, you are the reason I live, the reason I wake up every morning (and several times at night), and the reason I go to bed happy with my place here in this world. Thank you.

“Loss can dwell within us all our life.”

-Judith Viorst (1986)

## Chapter 1

### INTRODUCTION AND LITERATURE REVIEW

Those of us who have experienced the death of a loved one know that the clinical terms typically used to describe mourning and coping often fall short of capturing the complexity of the process. And yet, researchers and clinicians alike continue to try. We try because an understanding of emotions entails understanding our responses to the multitude of life's processes, including birth, death, the relationship of the living to the dead, and the relationship of one death to another.

The *Wall Street Journal* recently reported that early parental death reverberates throughout an individual's life, leaving an individual feeling like her family is missing a piece. The article elaborated that childhood parental death leaves emotional scars that do not heal for decades; it further emphasized that our society understands very little about the ramifications of the distress of bereaved individuals (Zaslow, 2010). One such ill-understood consequence of childhood parental or caregiver death may be that it affects the way we react to subsequent loss events; this question lies at the heart of the present study. The principal aim of this study is examine whether a history of one loss, parental or caregiver death, influences the impact of another loss, miscarriage, on depressive symptoms and grief.

Parental loss (by death and divorce) in childhood has been shown in most studies to predict depressive symptoms in adults (Barnes & Prosen, 1985; Bifulco, Brown, & Harris, 1987; Brown & Harris, 1978). Similarly, early parental death increases vulnerability for depressive symptoms following subsequent traumatic life events in

adulthood (Bifulco et. al., 1997) and raises an individual's subjectively perceived sense of vulnerability to future threatening losses (Mireault & Bond, 1992).

Several studies have shown that miscarriage affects the levels of depression and prompts grief reactions in women experiencing this loss (Beutel, Deckardt, von Rad & Weiner, 1995; Gerber-Epstein, Leichtentrit & Benyamini, 2009; Neugebauer et. al., 1992; Neugebauer, et.al., 1997; Ritsher & Neugebauer, 2002). While a grieving woman who has miscarried has few direct experiences or memories of the lost child that she can remember and cherish (Brier, 2008), grief after a miscarriage is similar in duration and intensity to grief following other significant losses (Maciejewski, Bahoui, Block & Prigerson, 2007, and Nikcevic et.al., 1999, as cited in Brier, 2008). The miscarrying woman's grief is also related to her psychological attachment to the fetus (Brier, 2008).

In her popular bestseller *Necessary Losses*, Judith Viorst beautifully outlines how losses in early childhood make us sensitive to losses we encounter later in life (Viorst, 1986). Klerman (1981) proposed that depression is precipitated by losses immediately after the loss event or at some point in the future when the patient is reminded of the loss (as cited in Stirtzinger, Robinson, Stewart & Ralevski, 1999). It follows from this notion that present losses can trigger memories of significant past losses. Some researchers have suggested that early losses (such as parental death) may affect the patterns of depression and grief following a miscarriage (Lin & Lasker, 1996), and that past and current life contexts serve as filters for the individual's appraisal of the miscarriage (Swanson, Connor, Jolley, Pettinato & Wang, 2007). It has also been suggested that how well an individual has coped with prior losses predicts how well he or she will cope with losses in the future (Brier, 2008). However, this interaction between early loss through parental or



caregiver death and current loss through miscarriage in predicting depression and grief has not been specifically examined thus far in the literature.

Without a critical evaluation of this relationship, the literature on the experience of women who have suffered a miscarriage is incomplete. Illumination of parental or caregiver death as a risk factor for depressive symptoms and grief following miscarriage would be a tremendous benefit to clinicians and patients. Specifically, if, miscarrying women with parental or caregiver death have higher levels of depressive symptoms than miscarrying women without such a loss, and pregnant women and non-pregnant women in the community with and without such a loss, then parental or caregiver death will be highlighted as an important risk factor for depressive symptoms both among miscarrying women, as well as compared to women who have not suffered a reproductive loss and women who have not experienced a recent reproductive event. The importance of parental or caregiver death as a risk factor will also be highlighted if the difference in the level of depressive symptoms in miscarrying women with and without a history of parental or caregiver death is greater than the difference in the level of depressive symptoms in pregnant and non-pregnant/community women with and without a history of parental or caregiver death. In this manner, the present loss that miscarrying women suffer can be assessed and understood in the context of their past loss.

Such an appraisal of a miscarrying woman's psychological distress in the context of her past losses can hold tremendous potential for treatment. Brier (2004) recommends enquiring about recurring and persistent thoughts related to the pregnancy loss as a useful treatment tool. As part of this dialogue, treatment following a miscarriage can also be geared toward enquiring about thoughts of early childhood losses. Validation of such

recurring thoughts about childhood losses may promote an experience of normality with her emotions and an anticipation of what lays ahead (Brier, 1999); a miscarrying woman may welcome such support in contextualizing her present experience in the context of her life experiences.

### **Parental Death and Adult Depression**

Since Freud proposed a profound link between early losses and later depression in his *Mourning and Melancholia* in 1917, several scholars have attempted to quantify and examine this association (Barnes & Prosen, 1985). Hill and Price (1967) broadly noted that the death of a parent is one of the few events in an individual's life that is independent of the behavioral pattern of the family. However, results of studies of adult depression in individuals with early parental death are largely inconsistent. Outcomes have varied in their emphasis on mother versus father loss as being more important; other studies have emphasized parental separation rather than parental death as an antecedent for adult depression. Yet others have concluded that the association between childhood parental loss and adult depression must be understood in the context of subsequent life events.

### **Childhood Death of the Father as an Antecedent to Adult Depression**

Among the earliest investigations into the impact of early parental loss, Hill and Price (1967) examined the association between parental death and adult depression among psychiatric inpatients who were depressed versus those who were admitted for psychiatric conditions other than depression. They found greater frequency of father loss between ages 0 and 14 among depressed patients compared to control patients; a similarly greater frequency of mother loss did not exist among the depressed patients in

this sample. The authors qualified their findings by noting that depressive patients may report father loss by death in cases when their father deserted the families, leading to an overestimation of the results. Similarly, given the historical context when the data were collected, the authors also emphasized the role of war in the greater frequency of father loss, as greater numbers of fathers may have lost their lives serving in combat at the time.

While Hill and Price (1967) underscored the trauma of losing a parent to death, they also emphasized the need to consider older paternal age at the time of the child's birth noting that the challenges of having an older parent may make an individual more vulnerable to depression in later life. The authors also noted the importance of considering the cause of parental death, as death by suicide may underscore the genetic component of depression in the participants. Further, they noted that it is difficult to separate parental loss from the impact of such a loss on subsequent life events in the association between parental death and depression.

The consideration of sociodemographic variables (such as paternal age) in understanding this association was tested approximately two decades later, in a study by Barnes and Prosen (1985), who interviewed 1,250 patients (34% male and 66% female and mean age 37.7 years) from physicians' offices in Canada and examined the effects of father loss and mother loss on depressive symptoms. The authors found that 33.2% of their sample would be classified as depressed; among these individuals father loss was associated with depression but mother loss was not.

They further examined whether other social or demographic variables (such as older age and/or lower education) could account for the association between father loss and depression; they found this to not be the case. Their analyses also revealed that father

loss was particularly associated with depression when the loss occurred during the 0 to 6 and 10 to 15 year age levels. Barnes and Prosen (1985) explained their findings by noting that the absence of a father may place financial and social burdens on a child that may lead to a learned helplessness which may subsequently lead to depression in adulthood. While these results provide support to early hypotheses, there are several confounding factors, such as the family-of-origin's socioeconomic status, and age of the parent at the time of the child's birth, that Barnes and Prosen (1985) did not take account of.

Most recently, Jacobs and Bovasso (2009) conducted a follow-up study of respondents from the 1980 Baltimore Epidemiologic Catchment Area survey. The authors examined childhood parental death taking into consideration variables of sociodemographic characteristics, and life events. Of the sample of 1920 respondents (63.2% female with mean age 48 years and 26.8% male with mean age 47 years), Jacobs and Bovasso (2009) found that paternal death, but not maternal death, significantly predicted major depression after adjusting for life events, gender and marital status both at baseline and at follow-up. Further, they noted that paternal death more than doubled the risk for depression in adulthood. The study also did not find any significant interactions between frequency of major depression and gender of the parent, gender of the child, age of the child at the time of loss, and current age. Jacobs and Bovasso (2009) explained their findings by noting that paternal death may significantly affect the quality of life (through prolonged financial complications) particularly when the father's death occurred prior to 1960 when there was a greater discrepancy between maternal and paternal income. They further added that since children and adolescents can do little to alleviate financial constraints, they may develop feelings of passivity and helplessness.

### **Childhood Death of the Mother as an Antecedent to Adult Depression**

Psychosocial context has been used to explain the findings of childhood paternal death in predicting adult depression, by noting the importance of the father in a family's financial viability; these studies were all conducted in Western societies and cultures. In a non-Western context, Kunugi et.al. (1995) compared 122 inpatients (mean age 46.3 years) with major depressive disorder at a hospital in Japan, with 94 individuals (mean age 46.0 years) who were in or out patients at an internal medicine unit in the same hospital.

In contrast to the studies noted above, Kunugi et. al. (1995) found that maternal death was significantly more common among the depressive group than the controls; they found this association among both male and female respondents, with a stronger association among women. The authors found no significantly greater incidence of paternal loss among the depressive group compared to the controls. Kunugi et.al. (1995) further found only two individuals in the depressive group whose parents suffered from psychiatric illness; they used this finding to rule out the effect of genetic factors in the association between maternal loss and depression. The authors also compared the effect of separation from parents (mother and father) on adult depression, and found a similarly greater incidence among the depressive group than the controls. Kunugi et. al. (1995) explained their findings by noting that Japanese society expects the responsibility of childcare to be fulfilled largely by the mother with fathers generally playing a smaller role, leading to a greater impact of loss of mother on the child's subsequent psychological development.

### **Life Events and the Effects of Early Parental Death on Adult Depression**

Loss of mother as an important factor in predicting adult depression was similarly proposed by Brown, Harris and Copeland (1977). In a random sample of 458 women (18-65 years), they examined the effects of various kinds of losses: loss of mother or father prior to age 17 by death or separation, loss of sibling by death between ages 1 and 17, loss of a child (including by stillbirth) at any age, and loss of a husband by death. The authors also examined the ways in which such losses contributed to the development of depression. Specifically, they investigated whether the loss event acted as a provoking agent (producing the disorder), vulnerability factor (enhancing the individual's sensitivity to provoking agents), or symptom formation factor (determining the nature and severity of the depressive symptoms).

In this sample, 37% of the respondents had at least one such loss, but only loss of mother before age 11 acted as a vulnerability factor (women with difficult life events were much more likely to develop depression if they had an early maternal loss). The authors also proposed that other losses (except for maternal loss) played a stronger role as symptom formation factors that moderated the level of depressiveness reported.

Roy (1978) similarly proposed that loss of mother prior to age 11 is a vulnerability factor in the development of depression in adult, working class women. In a sample of 84 Caucasian women (ages 18-65 years) with physician referrals of depression, Roy (1978) found depressive symptoms to be associated with the presence of three or more children under 14 years in the home, lack of a confiding marital relationship, and lack of full or part-time employment. The author did not distinguish between maternal

death and separation, and did not examine whether this variable predicted depressive symptoms over and above the others.

The emphasis on interpreting depressive reactions to early parental death in the context of life events was continued by Bifulco et. al. (1987), who proposed that any association between childhood parental loss (through death or separation) and adult depression is unlikely to occur in the absence of difficult life events. The authors interviewed 395 women (ages 18-50 years) of European or Caribbean origin from an inner London borough who had a spouse in a manual occupation, and had at least one child at home. Among the life events that the authors examined, they enquired about the woman's history of premarital pregnancy (regardless of pregnancy outcome, and including miscarriages). The authors found that loss of mother and lack of parental care were both associated with a prevalence of depression in adult life. Further, they concluded that lack of care was more influential in the onset of depression than loss of mother; they proposed that loss of mother, which serves as the vulnerability factor, is only associated with adult depression in the context of lack of care. The authors of this study did not specifically investigate miscarriages as moderating life events.

Similarly, McLeod (1991) specifically examined the importance of life events in explaining the relationship between childhood parental death and adult depression. The author tested a model where parental losses create socioeconomic and relational difficulties in an individual's life, which in turn lead to adult depression. McLeod (1991) surveyed 1,755 respondents from Caucasian married couples (ages 18 to 64) living in the Midwestern United States about their history of parental loss and depression. Of the

sample, 8.9% reported a childhood parental death, 9.7% reported a childhood parental divorce, and 2.0% reported not living with their parents through age 16.

The author found higher levels of depressed mood among women who had lost a parent compared to women who had not; such a relationship was not found among men in the sample. The author found a stronger relationship between parental divorce, as opposed to parental death, and adult life outcomes, particularly among female respondents. Further, women with parental divorce were more likely to earn less money, marry at young ages, and report more conflictual and less supportive marital relationships. These adult outcomes explained a substantial amount of the relationship between parental divorce and adult depression. McLeod (1991) also noted that while parental death was weakly related to adult depression in this sample, this relationship was not explained by perceived marital quality. Although the author attempted to connect early losses with life outcomes in explaining adult depression, parental death may have played a more significant role in predicting adult depression had other life outcomes (unrelated to marital quality) been considered as mediating factors.

The role of increased vulnerability in explaining the relationship between childhood parental death and adult depression was also emphasized by Mireault and Bond (1992), who suggested that early parental death may increase an individual's perceived vulnerability to experiencing future threatening events leading to distress. They sampled 127 undergraduate students (ages 17 to 25 years) from a public university in New England who had experienced the childhood death of a parent (68% had experienced paternal death and 32% had experienced maternal death); 98.4% of this group were below the age of 18 when the loss occurred. These individuals were



compared with a control group of 166 individuals with no childhood parental loss. For the purposes of clarity, the authors excluded individuals whose parents were divorced.

Mireault and Bond (1992) found that although there were no differences in the bereaved and non-bereaved groups on the variables of anxiety and depression, the groups significantly differed in their perceived vulnerability to future losses. They strongly proposed that the expectation of future loss may pose more risk than the early loss itself in the development of depression in individuals with childhood parental loss. Mireault and Bond (1992) qualified their findings by noting that the nature of the sample (college students) may explain the lack of association between early parental loss and depression as the challenges of being in college may have necessitated psychological adjustment in these individuals leading to lower reported depression due to parental loss.

### **Parental Separation, and not Parental Death, is the Antecedent Event**

Roy (1981) examined the relationship between difficult life events (assessed by social class) and early parental loss in the development of depression in adulthood. The author compared 187 patients (18-65 years) with depression in a hospital in Canada, with 102 non-depressive control patients from the same hospital matched for age, sex and social class. While 44.3% of the depressed patients reported parental loss prior to age 17, parental death did not emerge as a significant factor in the development of depression in the context of difficult life events; in contrast, parental loss by separation did significantly influence this relationship.

The emphasis on childhood parental separation as the antecedent event to adult depression was also noted by Tennant, Smith, Bebbington and Hurry (1981), who compared a sample of controls from a working class neighborhood in South London with

psychiatric outpatients referred from the same geographical area. The authors examined the effects of parental death in childhood (maternal and paternal death between 0-10 years and 11 to 18 years) and separation from parent (other than death) on psychiatric symptoms (unreferred) and psychiatric illness (from referrals). In their analyses Tennant et. al. (1981) also considered age, sex, marital status, cultural origin, current and parents' social class, maternal and paternal age at birth, and relative position in the family. After examining the interactions between loss events and the other factors, the authors concluded that neither maternal nor paternal deaths are related to any subsequent psychiatric disorder. In contrast, they proposed that parental separation between the ages of 0 and 15 significantly affect the development of psychiatric illnesses in adult life.

Roy (1983) also compared the relationship of parental separation with adult depression in 300 depressed patients (ages 18-65 years) in England and Toronto, with non and never- depressed gynecologic and orthopedic control patients matched for age, sex, marital status and social class. In almost all the cases in this sample, parental separation had followed the breakup of the parents' marriage. Roy (1983) found that loss of mother due to separation (not by death) before 11 and 17 years was associated with nonendogenous depression in adulthood in psychiatric patients. However, the percentage of individuals in the maternal loss category was small (10% had experienced maternal loss prior to age 17 and 6.7% had experienced maternal loss prior to age 11). Further, more of the psychiatric patients compared to controls had experienced permanent separation from the father prior to age 17 years (9.3% experienced paternal separation prior to age 11 years and 16.7% experienced paternal separation prior to age 17 years). Social class differences in this relationship were marked with 22.5% of working class

depressed patients reporting paternal separation and 14.7% reporting maternal separation in childhood, compared to 12.3% of middle class depressed patients reporting paternal separation and 6.4% reporting maternal separation in childhood.

### **Miscarriage and Depression**

Like childhood parental loss, miscarriage represents a considerable loss for a woman including loss of the connection she was beginning to experience with her fetus, her self-esteem, and the imagined future with her child (Brier, 1999). Psychologically, a miscarriage may also produce doubts about an individual's procreative competence (Klier, Geller, & Ritsher, 2002). Despite current knowledge that chromosomal abnormalities are often directly related to the likelihood of miscarriages (Griebel, Halvorsen, & Golemon, 2005), miscarrying women experience the event as shocking (Broen, Moum, Bodtker, & Ekeberg, 2004); the biological inevitability of the loss does not offer the miscarrying woman any solace. Miscarrying women also report greater grief and feelings of loss than women who have undergone an induced abortion (Broen et. al., 2005). Further, standard treatments following a miscarriage, such as dilation and curettage or vacuum aspiration (Griebel et. al., 2005) have themselves been associated with greater psychological distress (Nielsen, Hahlin, Moller & Granberg, 1996). Several treatment options have been considered following a miscarriage; structured follow-up visits have not been found to be significantly better at reducing the levels of grief and depression among miscarrying women (Adolfsson, Bertero and Larsson, 2006). As discussed below, emotional reactions to miscarriage have thus far been examined in the context of various psychosocial variables.

## **Depressive Symptoms**

Stirtzinger et. al. (1999) examined the association between miscarriage and depression in women seeking obstetric care at two hospitals in Canada. They interviewed 175 women at three months following miscarriage, 119 women at one year following miscarriage, and 31 women at both time points. In interpreting these results, it is important to note the substantial attrition in their sample over time. The authors found a strong association between miscarriage and depression with greater depression reported by women under thirty years of age with multiple miscarriages. Women who reported moderate or severe problems with their spouse also had significantly higher depression than those without such spousal problems. Similarly, women who felt the miscarriage was only partially their fault indicated significantly lower depression than those who felt the miscarriage was totally their fault; mixed feelings about the pregnancy were also associated with higher guilt scores. It is important to note that these authors did not distinguish between guilt associated with depression, and guilt resulting from other factors. Women were particularly vulnerable to self-blame when a clear medical cause for the miscarriage was not provided.

Beutel et. al., (1995) similarly examined the reactions to miscarriage among 125 women in a university hospital in Germany. The authors used 80 women in the first 20 weeks of an uncomplicated pregnancy as the control subjects. They found a significant association between miscarriage and depressive reactions that were manifested through dejected spirits, alienation from other people, irritability, rumination, restlessness, and increased anxiety. The authors also found that grief reactions (characterized by preoccupation with the lost child, yearning for the pregnancy, sorrow at the sight of

pregnant women, and self-reproaches for not having done enough to protect the baby) occurred in patients with a strong investment in the pregnancy. Although individuals with depressive and combination depressive and grief reactions showed a decline in their symptoms after six months, their symptoms remained more intense than those with a purely grief reaction. Patients who were depressed and those who had a combination of depressiveness and grief also reported the most dissatisfaction with their partner's support. The authors found that such intense reactions to miscarriage occurred as early as the tenth week of gestation; they proposed that even prior to verification of a viable pregnancy, the fetus achieved mental representation in the minds of the women through dreams, internal dialogues, and preparation for the child's birth. In the absence of such attachment, a depressive response to miscarriage was triggered by previous depression, lack of social support, and mixed feelings about the pregnancy and child. Those patients who had no reaction to the miscarriage had not developed an attachment to their unborn baby.

### **Other Affective Responses to Miscarriage**

Miscarrying women also experience heightened anxiety immediately after the loss event, often characterized by somatic complaints; the symptoms gradually decline over a six-month period, and eventually fully remit after about one year. Among anxiety disorders as a broad category, miscarrying women appear most at risk for obsessive compulsive disorder and post-traumatic stress disorder, both of which involve the repetition of thoughts (Brier, 2004).

In a sample of 85 miscarrying women, Swanson et. al. (2007) found three distinct grief responses, namely healing responses (suggesting that the women are moving on

from the loss), actively grieving responses (characterized by women actively grappling with the loss by recalling the events), and overwhelmed responses (characterized by feelings of blame, loss of control and confusion about the way life was supposed to be). Women with healing responses reported less negative events and less sexual or interpersonal distance from their partners; these women were also less likely to have miscarried again and more likely to be pregnant or a new mother.

### **Sources of Support in Healing After a Miscarriage**

Mann, McKeown, Bacon, Vesselinov, and Bush (2008) examined the levels of religiosity, spirituality and grief following miscarriage (using the grief scale used in this study) in 27 miscarrying women at three obstetrics practices in the Southern United States. The authors found that increasing age was inversely associated with both grief and depressive symptoms. Similarly, having more children was inversely associated with depressive symptoms. Religious attendance and self-rated spirituality were also both inversely associated with grief.

Familial sources of support following a miscarriage were investigated in a study of 122 women (mean age 28.5 years) and their partners in Pennsylvania. In this study, Lin and Lasker (1996) found that women experience higher levels of grief than men. The authors also noted that marital relationships that are strong and supportive may facilitate the healing process after the loss and may prevent an increase in grief scores (Lin & Lasker, 1996). In this sample, higher rates of subsequent births and pregnancies were also associated with declining grief scores.

Similarly, in a study of 227 miscarrying women (ages 19 to 41 years) in the Netherlands, Cuisinier, Janssen, de Graauw, Bakker and Hoogduin (1996) found that a

new pregnancy and birth of a child, both significantly lessen the level of grief following a pregnancy loss. The effect was greatest for women with more pre-loss mental and physical symptoms, poor partner relationship prior to loss, and previous living children. Most of the women in this study saw the subsequent pregnancy and birth as facilitating the process of coping with the loss.

### **Previous Findings from Data Used in the Present Study**

Data for the current investigation were collected previously as part of a large-scale study (Neugebauer et. al., 1992; Neugebauer et. al., 1997; Ritsher & Neugebauer, 2002). Previous findings from these data have provided vital empirical support for feelings of depression experienced by a woman following a miscarriage. The study investigated depressive symptoms, major depressive disorder, and grief in miscarrying women. Pregnant women and non-pregnant/community women were used as controls for some of the analyses.

Participants for the study were recruited, in part, from among miscarrying and pregnant women seeking care at Columbia Presbyterian Medical Center in New York City; non-pregnant/community women in the study were located through random-digit dialing of telephone numbers based on telephone area codes and exchanges of the miscarrying women (Neugebauer et. al., 1997). The sample was divided into three cohorts: women who had recently miscarried; pregnant women; women in the community who had not been pregnant in the preceding year. The miscarriage cohort was used to assess the impact of pregnancy loss on depression and as a trigger for grief reactions. The pregnant cohort was used to assess the level of depression in women with an uninterrupted pregnancy. The non-pregnant/community cohort was used to assess the

level of depression in women in the absence of any recent reproductive event (Neugebauer, et. al., 1992, Neugebauer, et. al., 1997, Ritsher & Neugebauer, 2002).

The study defined miscarriage as an involuntary termination of a nonviable intrauterine pregnancy before 28 completed weeks of gestation. Women in the miscarriage cohort were interviewed at three time points: 2 weeks, 6 weeks and 6 months after the loss event. A total of 382 miscarrying women were interviewed at least once; of these 232 were first interviewed at two weeks, 114 were first interviewed at six weeks, and 36 were first interviewed at six months after the miscarriage event. Among the pertinent measures administered (discussed in detail in the following chapter), miscarrying women were administered the CES-D and the PBGS at all three time points. Two hundred and eighty three pregnant women were interviewed at one time point, mostly in the second trimester (roughly matched with miscarrying women on week of gestation); they were administered the CES-D. Similarly, 318 non-pregnant/community women were interviewed at one time point; they were administered the CES-D. At the conclusion of phase 1 of the study, miscarrying women available at time 3 (6 months) and non-pregnant/community women were administered the DIS for diagnostic assessment. At this point 229 miscarrying women and 230 non-pregnant/community women were administered the DIS (Neugebauer, et. al., 1992, Neugebauer, et. al., 1997, Ritsher & Neugebauer, 2002).

Information about parental or caregiver death, and questions pertaining to reproductive history, sociodemographic characteristics, and aspects of social functioning were also included; interviews were conducted by telephone in English or Spanish (Neugebauer, et. al., 1997). The interviews followed a strict structure with fixed response



options. To ensure that interviewers did not influence responses, monthly ad hoc interviewer probes were conducted, and taped interviews were periodically audited (Neugebauer, et. al., 1992). Since the measures assessing depressive symptoms, major depressive disorder, and grief were not all administered to every participant in every set of analyses, each of the findings discussed below include varying numbers of participants.

### **Depressive Symptoms**

Neugebauer et. al. (1992) compared depressive symptoms among 232 miscarrying women (mean age 29.2 years, 25.4% Caucasian, 23.3% African American, 43.3% Hispanic, and 7.7% Other) within four weeks of the miscarriage event (although 85% of them were interviewed between 7 and 15 days after the loss), 283 pregnant women (mean age 29.0 years, 36.4% Caucasian, 15.5% African American, 44.9% Hispanic, and 3.2% Other) in their second trimester, and 318 non-pregnant/community women (mean age 30.0 years, 36.6% Caucasian, 19.6% African American, 38.2% Hispanic, and 5.7% Other) on depressive symptomatology. The authors also examined the woman's wish to conceive, emotional reactions to learning about the pregnancy, and consideration of elective abortion.

Neugebauer et. al. (1992) found that depressive symptom levels were higher in miscarrying women compared to the pregnant and non-pregnant/community cohorts. They also found that while the pregnant and non-pregnant/community cohorts reported greater depressive symptoms with an increase in the number of children, depressive symptoms in the miscarriage cohort decreased with increasing numbers of children. Further, compared to the pregnant women in the sample, miscarriage had a greater impact

on women with wanted, as opposed to unwanted, pregnancies. Neugebauer et. al. (1992) also concluded that prior reproductive losses and maternal age did not affect the level of depressive symptoms in miscarrying women.

## **Grief**

Ritsher and Neugebauer (2002) specifically investigated grief following miscarriage, defining traumatic grief as distinct from both normal grief and post-traumatic stress disorder, and explicitly identifying grief as the yearning for the lost baby and the lost pregnancy. The authors also assessed depressive symptoms, and investment in and wantedness of the pregnancy and baby. Out of the total 382 miscarrying women in the sample, the first 78 were not administered the grief scale since the measure was introduced later in the study. 213 miscarrying women from the remaining group had no missing items on the grief scale used (PBGs). 133 miscarrying women were first interviewed at 2 weeks, 63 were first interviewed at 6 weeks (119 were re-interviewed), and 17 were first interviewed at 6 months (163 were re-interviewed). Final analyses for miscarrying women were based on 133 women at 2 weeks, 182 women at 6 weeks and 178 women at 6 months after the loss event.

Ritsher and Neugebauer (2002) established that the grief scale used measured yearning and a preoccupation with the deceased that was distinct from depression; however, they were unable to distinguish between the factors of yearning for the lost pregnancy and yearning for the lost baby. Further, they found that yearning tended to be greater among women who were invested in the pregnancy (through thinking of a name for the baby, having bought items for the baby etc.), and who had experienced sensations

of fetal movement. Yearning for the lost pregnancy and baby was only weakly correlated with whether the woman had wanted the baby.

### **Major Depressive Disorder**

As noted above, in phase 1 of the study, Neugebauer et. al. (1997) interviewed 382 miscarrying women at three time points. 318 non-pregnant/community women were interviewed at one time point for comparison. Miscarrying and non-pregnant/community women were matched for age, ethnicity, education, language, season of interview and mood. At the conclusion of phase 1 of the study (6 months after the loss event for miscarrying women), women from both cohorts were invited to participate in phase 2, a single diagnostic assessment (Neugebauer et.al., 1997). 229 miscarrying women and 230 non-pregnant/community women from phase 1 were assessed. Among phase 2 participants in both cohorts, 50% of the women were between 25-34 years of age, 40% were Caucasian, 33% were Hispanic, and 55% had more than a high school education. Caucasian women, married women, and women with higher education were overrepresented in the phase 2 sample. The cohorts in phase 2 also differed on some sociodemographic variables and reproductive history (miscarrying women were more often married, had more prior reproductive losses, and had more living children).

Neugebauer et. al. (1997) found that in the six months following pregnancy loss, miscarrying women were at significantly higher risk for major depressive disorder compared to non-pregnant/community women in the six months prior to their interview. The study also found that early warning of reproductive problems (such as prolonged bleeding or early diagnosis of fetal demise) did not lower the risk for depression among miscarrying women. The presence of previous children was a protective factor as 16.5%

of childless miscarrying women and 3.3% of childless non-pregnant/community women were at risk for major depressive disorder, as compared with 7.2% of miscarrying women and 5.5% of non-pregnant community women with children. Prior history of major depression also proved to be a risk factor for major depression following a miscarriage.

In sum, the association between childhood parental death and adult depression has been supported by prior research; the importance of life events in understanding this association has been emphasized. Miscarriage has similarly been supported as an antecedent of depressive symptoms, grief, and major depressive disorder; the role of familial support in coping with the distress following a miscarriage has also been suggested. However, the next logical step of addressing whether miscarriage and childhood parental death interact to compound the distress of a miscarrying woman has not been addressed thus far. The present study will be the first of its kind to specifically examine this relationship, and add a valuable dimension to this realm of knowledge.

### **Aims and Hypotheses**

Although previous findings have established a link between childhood parental death and adult depression, and miscarriage and depressive symptoms, grief, and major depressive disorder, there are still many gaps in this area that need to be filled. In order to address these gaps in current knowledge, this study will examine whether a history of childhood parental or caregiver death moderates the level of depressive symptoms and grief following a miscarriage. Based on findings from prior research related to depression following parental or caregiver death, and research documenting higher levels of depression among miscarrying women as compared with pregnant and community women, this study will test three specific hypotheses.

First, two weeks following the pregnancy loss, miscarrying women with a history of parental or caregiver death prior to age eighteen will have higher levels of depressive symptoms, and higher levels of grief than miscarrying women without such a history.

Second, pregnant and non-pregnant/community women with a history of parental or caregiver death prior to age eighteen will have higher levels of depressive symptoms than pregnant and non-pregnant/community women without such a history.

Third, a history of parental or caregiver death will interact to increase the mental health effects of miscarriage such that the difference in levels of depressive symptoms between miscarrying women with and without a history of parental or caregiver death (at 2 weeks after the loss) will exceed the difference in levels of depressive symptoms between pregnant and non-pregnant/community women with and without a history of parental or caregiver death.

Additionally, exploratory analyses will address whether, a history of parental or caregiver death will increase the mental health effects of miscarriage such that the difference in the rates of major depressive disorder between miscarrying women with and without a history of parental or caregiver death will exceed the rates of major depressive disorder between non-pregnant/community women with and without a history of parental or caregiver death. Since the analyses will involve a dichotomous outcome variable with a smaller sample, the power of this prediction is likely to be much lower.

Similar exploratory analyses will also examine whether the relationship between miscarriage and depression, and miscarriage and grief in women with and without parental or caregiver death is moderated by the woman's age when the parent or caregiver died, gender of the deceased parent or caregiver, and the presence of living

children. These analyses are likely to have low statistical power. For all analyses, the present study will specifically compare individuals in the three study cohorts with and without parental or caregiver death, and with parental or caregiver death before and after age eighteen.

## Chapter 2

### METHOD

In order to address the hypotheses outlined in the previous chapter, this study will analyze data collected previously through a large scale study. Methodology for the present study is the same as that discussed in the preceding chapter for previous findings from the same data. Although the interview schedule with participants included several measures, only the measures relevant to the present study are discussed here.

#### **Participants**

As noted earlier, participants for the study were recruited, in part, from among women seeking care at Columbia Presbyterian Medical Center in New York City; non-pregnant/community women in the study were located through random-digit dialing of telephone numbers based on telephone area codes and exchanges of the miscarrying women (Neugebauer et. al., 1997). The sample was divided into three cohorts: women who had recently miscarried (n=382); pregnant women (n=283); women in the community who had not been pregnant in the preceding year (n=318). The study defined miscarriage as an involuntary termination of a nonviable intrauterine pregnancy before 28 completed weeks of gestation. The miscarriage cohort was used to assess the impact of pregnancy loss on depression and as a trigger for grief reactions. The pregnant cohort was used to assess the level of depression in women with an uninterrupted pregnancy. The non-pregnant/community cohort was used to assess the level of depression in women in the absence of any recent reproductive event. (Neugebauer, et. al., 1992, Neugebauer, et. al., 1997, Ritsher & Neugebauer, 2002).

Based on one-way ANOVAs for continuous variables, and chi-square tests for categorical variables, Hispanic race was found to be most represented in all three cohorts (miscarriage cohort, 43.5%; pregnant cohort, 44.9%; community cohort, 38.2%). The pregnant (28.6% with at least a college degree) and non-pregnant/community (29.7% with some college education) cohorts were relatively more educated than the miscarriage cohort (30.6% without a high school diploma). Most women in the miscarriage and pregnant cohorts were married (57.8% married and 60.8% married respectively) compared to women in the non-pregnant/community cohort who were mostly single (46.5% single). More women in the miscarriage and non-pregnant/community cohorts had no living children (36.6% in the miscarriage cohort and 50.5% in the non-pregnant/community cohort); the pregnant cohort comprised predominantly of women with one living child (37.8%). Women in all three cohorts largely reported not having previous reproductive losses (63.8% in the miscarriage cohort, 71.0% in the pregnant cohort, and 82.5% in the non-pregnant/community cohort). The predominant income group in the miscarriage and pregnant cohorts reported an annual household income of less than \$9999 (37.1% in the miscarriage cohort and 39.6% in the pregnant cohort respectively); in comparison, the predominant (34.2%) income group in the non-pregnant/community cohort reported an annual household income of \$20000-\$40000. A significant difference was also noted between the miscarriage and pregnant cohorts in their hospital payment status (public versus private patients); there were more private patients in the pregnant cohort (39.2% private) as compared to the miscarriage cohort (28.4% private). Information regarding hospital payment status was unavailable for women in the non-pregnant/community cohort. All of these between-groups



sociodemographic differences, and the analytic strategy to address them, are explored in greater detail in the following chapter.

### **Measures**

Information about the participants' history of childhood parental or caregiver death was assessed through structured questions in the interview schedule. These questions included, "who raised you until you were 18," "are they still living," "how old were you when he/she died," and "how old was [decedent] when she/he died." The outcome variables of depressive symptoms, grief, and major depressive disorder were assessed through three measures.

#### **Depressive Symptoms**

The Center for Epidemiological Studies scale (CES-D) (Radloff, 1977) is a widely used measure of affective, cognitive, and somatic symptoms of depression. This 20-item measure assesses the presence and duration of depressive symptoms in the seven days preceding the interview. Responses are recorded on a four-point Likert scale. The scale has high internal consistency in general ( $\alpha = .85$ ) as well as patient populations ( $\alpha = .90$ ). The test-retest reliability for the scale is moderate ( $r = .54$ ) although there are variations based on the group (Radloff, 1977). In previous findings from the data used in the present study, women were considered highly symptomatic if they received a CES-D score of 30 or more; fulfillment of this criteria would suggest further investigation for major depressive disorder (Neugebauer et. al., 1992).

#### **Grief**

The Perinatal Bereavement Grief Scale (PBGS) (Ritsher & Neugebauer, 2002) is a 15-item scale designed to measure grief and yearning for the lost pregnancy and lost

baby ( $\alpha = .81-.89$  for the English version;  $\alpha = .85-.91$  for the Spanish version). The scale has statistically significant, moderate correlations with the CES-D that decline over time ( $r = .50-.38$  for the English version;  $r = .47-.33$  for the Spanish version). Spanish language translation of the scale was conducted through a systematic process of translation and backtranslation by a team of five bilingual Ph.D. candidates (Ritsher & Neugebauer, 2002).

There are seven pregnancy items on the scale including, “you dreamed you were still pregnant,” and “you patted or held your belly as though you were still pregnant.” There are seven items on the scale about the lost baby including, “you wanted to hold the baby in your arms,” and “you imagined what the baby would have looked like.” The remaining item on the scale is, “you felt physically ill when you thought about the miscarriage.” Responses are recorded on a four-point Likert scale (scored from 1 to 4); responses range from ‘rarely to none of the time,’ ‘less than 1 day,’ ‘most or all of the time,’ and ‘5 to 7 days.’ All responses are summed to yield the total score; only one item on the PBGS (“you found it easy to think about things other than the baby”) is reverse-coded (Ritsher & Neugebauer, 2002).

### **Major Depressive Disorder**

The Diagnostic Interview Schedule (DIS) (Robins, Helzer, Croughan, & Ratcliff, (1981)) was administered to miscarrying and non-pregnant/community women to assess major depressive disorder. The DIS version used in this study uses DSM-III diagnostic criteria. An independent test of its accuracy by Robins et. al., (1981) showed that the scale has good validity in determining depressive disorder in current and former patients ( $k = .59$  and  $K = .49$  respectively).

The DIS uses a fixed sequence of standardized questions and responses to determine the presence, severity and distribution over time of non-medical, psychiatric symptoms. The DIS identifies the subject's first, most recent, and most severe depressive episodes; all episodes receive a diagnosis of major depressive disorder if the worst episode meets diagnostic criteria (Robins, Helzer, Croughan & Ratcliff, 1981). The data in this study were collected by modifying the DIS to record up to three depressive episodes in the 12 months prior to the interview, and to require fulfillment of diagnostic criteria at each episode. Depressive symptoms that were attributed by a physician to physical aspects of the pregnancy were additionally recorded; these symptoms were not counted toward the diagnosis (Neugebauer, et. al., 1997).

### **Other Measures**

The Crown Marlowe Social Desirability Scale (Crown & Marlowe, 1960) was administered to women in the miscarriage cohort to assess biased responding on the basis of social desirability (Ritsher and Neugebauer, 2002). As indicated in Table 2, the scale was not significantly correlated with the outcome variables.

### **Procedure**

As noted earlier, all participants were administered an interview schedule that included the outcome variables and information about parental or caregiver death, among other measures; interviews were conducted by telephone in English or Spanish (Neugebauer, et. al., 1997).

Miscarrying women were assessed at three time points (2 weeks, 2 months, and 6 months after the event), pregnant women were assessed at one time point (approximately matched with miscarrying women on week of gestation), and non-pregnant/community

women were assessed at a random point in time during the calendar period when the miscarrying women were first interviewed (Neugebauer, et. al., 1992, Neugebauer, et. al., 1997, Ritsher & Neugebauer, 2002).

### **Analysis**

For the present study, eight classes of analyses were conducted to address each of the hypotheses outlined in the previous chapter. All of the analyses described below included confounding variables and relevant sociodemographic factors based on their correlation with outcome variables. Variables that were subsequently controlled were age, level of education, race, marital status, income, and the presence of one or more living children.

For the first class of analyses, independent samples t-tests were used to compare depressive symptoms (using the CES-D as a continuous outcome variable) in miscarrying, pregnant, and non-pregnant/community women with and without parental or caregiver death, and between miscarrying, pregnant, and non-pregnant/community women with parental or caregiver death before and after age eighteen. Similar comparisons were conducted for grief (using the PBGS as a continuous outcome variable) in miscarrying women at two weeks, six weeks and six months following the miscarriage event.

Second, linear regression analysis was conducted to examine the specific effect of parental or caregiver death on depressive symptoms in miscarrying women; this analysis used the CES-D as a continuous outcome variable, and parental or caregiver death as the independent variable. A similar analysis was conducted using the CES-D as a continuous

outcome variable, and parental or caregiver death before age eighteen, and parental or caregiver death after age eighteen as two independent variables.

Third, linear regression analysis was conducted to examine the specific effect of parental or caregiver death on depressive symptoms in pregnant and non-pregnant/community women; this analysis used the CES-D as a continuous outcome variable, and parental or caregiver death as the independent variable. A similar analysis was conducted using the CES-D as a continuous outcome variable, and parental or caregiver death before age eighteen, and parental or caregiver death after age eighteen as two independent variables.

Fourth, linear regression analysis was used to examine the specific effect of parental or caregiver death on the level of grief in miscarrying women; this analysis used the PBGS as a continuous outcome variable, and parental or caregiver death as the independent variable. A similar analysis was conducted using the PBGS as a continuous outcome variable, and parental or caregiver death before age eighteen, and parental or caregiver death after age eighteen as two independent variables.

Fifth, to examine the interaction effect of miscarriage and parental or caregiver death, the cohorts were dummy coded, and subsequently used as predictor variables in a multiple regression analysis. This analysis used the CES-D as a continuous outcome variable for depressive symptoms, and parental or caregiver death, miscarriage cohort, pregnant cohort, miscarriage X parental or caregiver death, and pregnant X parental or caregiver death as the independent variables. A similar analysis was conducted to compare the specific interaction effect of miscarriage and parental or caregiver death before and after age eighteen. This analysis used the CES-D as a continuous outcome

variable, and parental or caregiver death before age eighteen, parental or caregiver death after age eighteen, miscarriage cohort, pregnant cohort, miscarriage X parental or caregiver death before age eighteen, pregnant X parental or caregiver death before age eighteen, miscarriage X parental or caregiver death after age eighteen, and pregnant X parental or caregiver death after age eighteen as independent variables. In these analyses, the reference group was non-pregnant/community women.

Sixth, exploratory linear regression analyses were conducted to assess the moderating effect of the participant's age when the first parent or caregiver died, and gender of the primary deceased parent or caregiver on the relationship between miscarriage and depressive symptoms (using the CES-D as a continuous outcome variable) in women with and without parental or caregiver death; these analyses were restricted to individuals with at least one deceased parent or caregiver but were not limited to individuals with parental or caregiver death prior to age eighteen. The analyses were repeated for pregnant and non-pregnant/community women. The moderating effect of these variables on grief in miscarrying women at two weeks, six weeks, and six months following the miscarriage event was assessed with similar analyses using the PBGS as a continuous outcome variable.

Seventh, exploratory univariate analysis of variance (2 X 2 ANOVA) assessed the moderating effect of having at least one living child on the relationship between miscarriage and depressive symptoms (using the CES-D as a continuous outcome variable) in women with and without parental or caregiver death; this analysis was conducted first with individuals with and without parental or caregiver death, and then with individuals with parental or caregiver death before and after age eighteen. The

analysis was repeated for pregnant and non-pregnant/community women. The moderating effect of these variables on grief in miscarrying women at two weeks, six weeks, and six months following the miscarriage event was assessed with similar analyses using the PBGS as a continuous outcome variable.

Last, the effects of miscarriage and parental or caregiver death on major depressive disorder was assessed through a series of exploratory analyses. Chi-square tests were conducted to assess the incidence of major depressive disorder (using the major depressive disorder section of the DIS as a categorical outcome variable) in women with and without parental or caregiver death, and with parental or caregiver death before and after age eighteen. An exploratory logistic regression analysis examined the specific effect of parental or caregiver death on major depressive disorder in miscarrying women; this analysis used the major depressive disorder section of the DIS as a categorical outcome variable, and parental or caregiver death as the independent variable. The analysis was repeated using parental or caregiver death before age eighteen, and parental or caregiver death after age eighteen as two independent variables. Similar analyses were conducted for women in the non-pregnant/community cohort.

The interaction effect of miscarriage (in comparison to the non-pregnant/community cohort) and parental or caregiver death on major depressive disorder was also assessed using the DIS as a categorical outcome variable in a logistic regression analysis. This analysis used parental or caregiver death, miscarriage cohort, and miscarriage X parental or caregiver death as the independent variables. A similar analysis examined the interaction effect of miscarriage and parental or caregiver death before and after age eighteen on major depressive disorder. This analysis used the DIS as a

categorical outcome variable, and parental or caregiver death before age eighteen, parental or caregiver death after age eighteen, miscarriage cohort, miscarriage X parental or caregiver death before age eighteen, and miscarriage X parental or caregiver death after age eighteen as independent variables.

Exploratory logistic regression analyses were conducted to assess the moderating effects of the participant's age when the first parent or caregiver died, and gender of the primary deceased parent or caregiver on the relationship between miscarriage and incidence of major depressive disorder (using DIS as a categorical outcome variable) in women with and without parental or caregiver death; these analyses were restricted to individuals with at least one deceased parent or caregiver. The analyses were repeated for non-pregnant/community women. Results for each of the above analyses are presented in the following chapter.



## Chapter 3

### RESULTS

As noted in the preceding chapter, women in the miscarriage cohort were compared to pregnant and non-pregnant/community women. The miscarriage cohort was used to assess the impact of pregnancy loss on depression and as a trigger for grief reactions. The pregnant cohort was used to assess the level of depression in women with an uninterrupted pregnancy. The non-pregnant/community cohort was used to assess the level of depression in women in the absence of any recent reproductive event. (Neugebauer, et. al., 1992, Neugebauer, et. al., 1997, Ritsher & Neugebauer, 2002). Results from analyses with the three cohorts are presented below.

#### **Sample Characteristics and Analytic Strategy**

Determination of the variables to be included in analyses was made based on an assessment of sample characteristics, and the relationship of these characteristics to parental or caregiver death and outcome variables. The cohorts were compared on sociodemographic and reproductive characteristics; results of cohort comparisons using a one-way ANOVA (for continuous variables) and chi-square tests (for categorical variables) are presented in Table 1.

As noted in the previous chapter significant differences between cohorts were noted in ethnicity, level of education, marital status, income, number of living children, and number of prior reproductive losses. Hispanic race was most represented in all three cohorts (miscarriage cohort, 43.5%; pregnant cohort, 44.9%; community cohort, 38.2%). The pregnant (28.6% with at least a college degree) and non-pregnant/community (29.7%

with some college education) cohorts were relatively more educated than the miscarriage cohort (30.6% without a high school diploma). Most women in the miscarriage and pregnant cohorts were married (57.8% married and 60.8% married respectively) compared to women in the non-pregnant/community cohort who were mostly single (46.5% single). More women in the miscarriage and non-pregnant/community cohorts had no living children (36.6% in the miscarriage cohort and 50.5% in the non-pregnant/community cohort); the pregnant cohort comprised predominantly of women with one living child (37.8%). Women in all three cohorts largely reported not having previous reproductive losses (63.8% in the miscarriage cohort, 71.0% in the pregnant cohort, and 82.5% in the non-pregnant/community cohort). The predominant income group in the miscarriage and pregnant cohorts reported an annual household income of less than \$9999 (37.1% in the miscarriage cohort and 39.6% in the pregnant cohort respectively); in comparison, the predominant (34.2%) income group in the non-pregnant/community cohort reported an annual household income of \$20000-\$40000. A significant difference was also noted between the miscarriage and pregnant cohorts in their hospital payment status (public versus private patients); there were more private patients in the pregnant cohort (39.2% private) as compared to the miscarriage cohort (28.4% private). Information regarding hospital payment status was unavailable for women in the non-pregnant/community cohort.

Correlation analysis was conducted between sociodemographic, parental or caregiver death, and outcome variables. As presented in Table 2, the variables of age

Table 1

*Selected Sociodemographic and Reproductive History Characteristics of Women in the Three Cohorts*

	Miscarriage (n=232)	Pregnant (n=283)	Community (n=318)
<b>Sociodemographic Characteristics</b>			
Mean Age, y (SD)	29.2 (6.3)	29.0 (5.7)	30.0 (6.4)
Ethnicity, %*			
White	25.4	36.4	36.6
Black	23.3	15.5	19.6
Hispanic	43.5	44.9	38.2
Other	7.8	3.2	5.7
Interviewed in Spanish, %	33.6	25.8	26.4
Education, %*			
< High School	30.6	24.7	20.3
High School Graduate	26.7	20.9	24.5
Some College	23.7	25.8	29.7
College Grad +	19.0	28.6	25.5
Marital Status, %**			
Currently Single	27.6	22.6	46.5
Married	57.8	60.8	35.2
Other	14.6	16.7	18.3
Income, %**			
< \$9999	37.1	39.6	23.9
\$10K-19999	20.7	15.8	19.7
\$20K-39999	17.5	17.7	34.2
\$40K+	24.7	26.9	22.2
Hospital Payment Status			
Private, %	28.4	39.2	---
<b>Reproductive Characteristics</b>			
Nulliparous, %**	35.3	34.6	50.5
No. of Living Children, %**			
0	36.6	35.3	50.5
1	25.0	37.8	15.7
2	22.8	18.4	19.7
3+	15.5	8.5	14.1
No. of Prior Reproductive Losses, %***†			
0	63.8	71.0	82.5
1	21.6	20.8	12.9
2+	14.7	8.2	4.6

*Note:* Differences among the three groups were evaluated by an overall chi-square test for categorical variables and by a one-way analysis of variance for continuous variables. †Includes spontaneous abortions (89.6%), fetal deaths (3.7%), ectopic pregnancies (3.2%), and neonatal deaths (3.4%)

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

Table 2

*Correlations of Sociodemographic and Parental/Caregiver Death in the Three Cohorts Combined (n=983)*

	1	2	3	4	5	6	7	8	9	10	11	12
1 Age	1											
2 Education	.21**	1										
3 Income	.27**	.62**	1									
4 Number of Living Children	.31**	-.32**	-.25**	1								
5 Parent/Caregiver Deceased	.29**	.001	.01	.11**	1							
6 Parent/ Caregiver Deceased <18	.13**	-.003**	.002	.05	.58**	1						
7 CESD Time 1	-.11**	-.24**	-.28**	.08*	.08	.07	1					
8 Grief Time 1 <sup>†</sup>	-.25**	-.30**	-.37**	-.02	.15	.02	.51**	1				
9 Grief Time 2 <sup>†</sup>	-.28**	-.45**	-.37**	-.03	-.04	-.01	.40**	.60**	1			
10 Grief Time 3 <sup>†</sup>	-.26**	-.34**	-.34**	-.11	-.10	-.12	.40**	.52**	.70**	1		
11 Major Depressive Disorder <sup>‡</sup>	.01	.07	.04	-.02	.05	.06	.16**	.14	.03	.001	1	
12 Crown Marlowe <sup>†</sup>	.00	.05	.04	-.05	.03	-.02	-.01	-.03	-.07	-.09	-.09	1

Note: <sup>†</sup> Variables only apply to the Miscarriage Cohort; <sup>‡</sup> Variable only applies to the Miscarriage and Community Cohorts  
 \* $p < .05$ ; \*\* $p < .01$

( $r=-.11, p<.01$ ), level of education ( $r=-.24, p<.01$ ), and income ( $r=-.28, p<.01$ ) were significantly negative correlated with depressive symptoms (at two weeks after the miscarriage event for the miscarriage cohort). A significant negative correlation between age, level of education, and income was also noted with grief at three time points following the miscarriage event (two weeks: age ( $r=-.25, p<.01$ ), level of education ( $r=-.30, p<.01$ ), income ( $r=-.37, p<.01$ ); six weeks: age ( $r=-.28, p<.01$ ), level of education ( $r=-.45, p<.01$ ), income ( $r=-.37, p<.01$ ); six months: age ( $r=-.26, p<.01$ ), level of education ( $r=-.34, p<.01$ ), income ( $r=-.34, p<.01$ )). While number of living children ( $r=.08, p<.05$ ) was significantly correlated with depressive symptoms (in all three cohorts, and at two weeks after the miscarriage event in the miscarriage cohort), it was not significantly correlated with grief in the miscarriage cohort at any of the three time points. There were no significant correlations between parental death (at any age as well as prior to age eighteen) on depressive symptoms and grief. The sociodemographic and parental or caregiver death variables were not significantly correlated with major depressive disorder in the miscarriage and non-pregnant/community cohorts.

The Crown Marlowe Social Desirability Scale was administered to women in the miscarriage cohort to assess biased responding on the basis of social desirability (Ritsher and Neugebauer, 2002). As indicated in Table 2, the scale was not significantly correlated with the outcome variables.

Based on the findings presented in Tables 1 and 2, age, ethnicity, level of education, marital status, income, and number of living children were included in all analyses as covariates. Age, level of education (1- less than high school; 2- high school; 3- some college; 4- college; 5- post grad), income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-

\$39999; 4- \$40K+), and number of living children (0- no living children; 1- at least 1 living child) were included as continuous variables. Because the sample was mostly Hispanic and married (Table 1), race and marital status were included in the analyses as dummy coded variables. Race (White versus other; Black versus other; other race versus other) was accounted for by including the dummy coded variables ‘White versus other,’ ‘Black versus other,’ and ‘other race versus other’ rendering ‘Hispanic versus other’ as the comparison group. Similarly, marital status (not married versus other; cohabiting versus other; separated versus other) was accounted for by including the dummy coded variables ‘not married versus other,’ ‘cohabiting versus other,’ and ‘separated versus other’ rendering ‘married versus other’ as the comparison group. As the Crown Marlowe scale was only available for women in the miscarriage cohort, and because the scale was not significantly correlated with the outcome variables (Table 2), the Crown Marlowe index was not included in the analyses.

### **Parental or Caregiver Death**

As the questions pertaining to parental or caregiver death were not introduced until later in the study, this information was not available for all participants. The number of individuals in each cohort with parental or caregiver death at any age, and parental or caregiver death specifically before age eighteen are presented in Table 3; proportions are out of all the individuals in each cohort. Fifty three women in the miscarriage cohort, 40 in the pregnant cohort, and 86 in the non-pregnant/community cohort reported having experienced the death of at least one parent or caregiver. Of this group, 19 in the miscarriage cohort, 9 in the pregnant cohort, and 47 in the non-pregnant/community cohort reported that at least one parent or caregiver died prior to age eighteen. Analyses

Table 3

*Individuals with At Least One Parent/Caregiver Deceased Before Age Eighteen in Miscarrying, Pregnant, and Community Women*

	Miscarriage (n=382)		Pregnant (n=283)		Community (n=318)	
	(n)	%	(n)	%	(n)	%
At Least One Parent/ Caregiver Deceased <sup>†</sup>	53	13.9	40	14.1	86	27.0
At Least One Parent/Caregiver Deceased Before 18 <sup>†</sup>	19	5.0	9	3.2	47	14.8

<sup>†</sup>Out of all individuals in each cohort

for depressive symptoms included participants with valid responses for questions related to parental or caregiver death, as well as valid CES-D responses; likewise, analyses for grief included only those participants with valid responses for questions related to parental or caregiver death, as well as valid PBGS responses.

An analysis of the frequency of parental or caregiver death in each cohort by parent type is presented in Table 4; proportions of death presented in Table 4 are out of the total number of deaths in each cohort. Cumulative frequencies reflect individuals with multiple parental or caregiver deaths; 37 women had more than one parental or caregiver death (2 women reported 3 parental or caregiver deaths, and 1 woman reported 4 parental or caregiver deaths). Natural fathers were the most commonly deceased parent or caregiver (28 in the miscarriage cohort, 29 in the pregnant cohort, and 59 in the non-pregnant/community cohort), followed by natural mothers (21 in the miscarriage cohort, 9 in the pregnant cohort, and 31 in the non-pregnant/community cohort). Several individuals in each cohort also reported the death of grandmothers, grandfathers, step mothers, step fathers, other female relative/foster parent (including aunt), and other male relative/ foster parent (including uncle). It should be noted that natural father was assessed as the most commonly reported primary parental or caregiver death in response to the question, “who raised you until you were eighteen,” and “are they still living.” An assessment of the respondent’s closeness with this parent or caregiver, or the parent/caregiver’s level of involvement was not made.

### **Mean Differences in Depressive Symptoms (CES-D)**

Independent samples t-tests were conducted to address whether miscarrying women with and without parental or caregiver death report more depressive symptoms



Table 4

*Proportion of Parental/Caregiver Death in Miscarrying, Pregnant, and Community Women*

	Miscarriage (n=382)		Pregnant (n=283)		Community (n=318)		Total
	(n)	%	(n)	%	(n)	%	
Natural Father	28	45.9	29	64.4	59	50.9	116
Natural Mother	21	34.4	9	20.0	31	26.7	61
Grandmother	6	9.8	4	8.9	12	10.3	22
Grandfather	2	3.3	2	4.4	4	3.5	8
Step Mother	1	1.6	0	0	0	0	1
Step Father	1	1.6	0	0	1	1.6	2
Other Female Relative/ Foster Parent	2	3.3	1	1.6	5	4.3	8
Other Male Relative/ Foster Parent	0	0	0	0	4	3.5	4
<b>Total</b>	<b>61</b>		<b>45</b>		<b>116</b>		

*Note:* Numbers represent sum of all deceased parents; Cumulative frequencies do not amount to 100 as 37 women lost 2 or more caregivers (2 women had 3 caregivers lost and 1 woman had 4 caregivers lost; each caregiver lost had been counted separately)

Table 5a

*Independent Samples T-Test Results for Mean Depressive Symptoms in Women With and Without Parental/Caregiver Death*

	Miscarriage (n=382)			Pregnant (n=283)			Community (n=318)		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Parent/Caregiver Deceased	37	25.0	12.7	40	15.5	11.8	86	15.8	11.1
Parent/Caregiver Alive	64	22.0	11.7	115	14.7	10.7	204	14.5	11.1

than their pregnant and non-pregnant/community counterparts. As presented in Table 5a, women in the miscarriage ( $t=1.2, p>.05$ ), pregnant ( $t=.4, p>.05$ ), and non-pregnant/community ( $t=.9, p>.05$ ) cohorts with at least one deceased parent or caregiver did not report significantly more depressive symptoms than those without parental or caregiver death. Similarly, as presented in Table 5b, women in the miscarriage ( $t=.4, p>.05$ ), and non-pregnant/community ( $t=1.6, p>.05$ ) cohorts with at least one deceased parent or caregiver prior to age eighteen did not report significantly more depressive symptoms than those without parental or caregiver death prior to age eighteen. However, as Table 5b shows, women in the pregnant cohort reported significantly more depressive symptoms with a parent or caregiver deceased prior to age eighteen ( $t=2.8, p<.01$ ) compared to pregnant women with a parent or caregiver deceased after age eighteen.

### **Mean Differences in Grief (PBGS)**

Independent samples t-tests also assessed whether miscarrying women with parental or caregiver death report more grief at two weeks, six weeks, and six months after the miscarriage event than miscarrying women without parental or caregiver death. As presented in Table 6a, miscarrying women with at least one deceased parent or caregiver did not report significantly more grief two weeks ( $t= 1.3, p> .05$ ), six weeks ( $t= -.4, p> .05$ ), or six months ( $t= -1.0, p> .05$ ) after the miscarriage event. Similarly, as presented in Table 6b, miscarrying women with at least one deceased parent or caregiver prior to age eighteen did not report significantly more grief two weeks ( $t= -.2, p> .05$ ) and six weeks ( $t=.2, p> .05$ ) after the miscarriage event. However, as presented in Table 6b, six months after the miscarriage event, women with at least one parent or caregiver deceased after age eighteen reported significantly more grief than women with at least one parent or caregiver deceased before age eighteen ( $t=-1.4, p<.05$ ). To avoid multiple-

Table 5b

*Independent Samples T-Test Results for Mean Depressive Symptoms in Women With Parental/Caregiver Death Before and After Age Eighteen*

	Miscarriage (n=382)			Pregnant (n=283)			Community (n=318)		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Parent/Caregiver Deceased Before 18	13	26.2	9.3	9	24.4**	15.2	47	17.6	11.2
Parent/Caregiver Deceased After 18	24	24.4	12.7	31	12.9	9.4	39	13.7	10.6

\*\* $p < .01$

Table 6a

*Independent Samples T-Test Results for Mean Grief Across Time in Miscarrying Women With and Without Parental/Caregiver Death*

	Two Weeks			Six Weeks			Six Months		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Parent/Caregiver Deceased	30	31.3	10.6	36	22.8	6.4	36	20.2	7.2
Parent/Caregiver Alive	43	28.2	9.8	58	23.4	8.7	69	21.7	7.3

Table 6b

*Independent Samples T-Test Results for Mean Grief Across Time in Miscarrying Women Parental/Caregiver Death Before and After Age Eighteen*

	Two Weeks			Six Weeks			Six Months		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Parent/Caregiver Deceased Before 18	11	30.6	9.2	13	23.0	7.5	11	17.7*	4.0
Parent/Caregiver Deceased After 18	19	31.6	11.6	23	22.7	5.9	25	21.3	8.1

\* $p < .05$

treatment interference (Campbell & Stanley, 1963), post-hoc Bonferroni correction for 3 tests was performed. At the significance level of  $p < .02$ , six months after the miscarriage event, the level of grief reported by women with a parent or caregiver deceased after age eighteen was not significantly more than the level of grief reported by women with a parent or caregiver deceased before age eighteen.

### **Parental or Caregiver Death and Depressive Symptoms**

Linear regression analyses were conducted to assess the effect of parental or caregiver death on depressive symptoms in miscarrying, pregnant and non-pregnant/community women. Results for the effect of parental or caregiver death (not specifically prior to age eighteen) are presented in Table 7a. As noted earlier, age, level of education, race, marital status, income, and number of living children were controlled for in all analyses.

In these controlled analyses, miscarrying women with at least one parent or caregiver deceased had significantly more depressive symptoms than miscarrying women without a parent or caregiver deceased ( $B = 7.8, p < .01$ ). Parental or caregiver death did not appear to be associated with depressive symptoms in non-pregnant/community women. When parental or caregiver death prior to age eighteen was specifically assessed, as presented in Table 7b, pregnant women with at least one parent or caregiver deceased prior to age eighteen reported significantly more depressive symptoms than pregnant women without a parent or caregiver deceased prior to age eighteen ( $B = 12.3, p < .01$ ). The association between miscarriage and parental or caregiver death prior to age eighteen was not significant.

Table 7a

*Multiple Regression Analysis for Parental/Caregiver Death on Depressive Symptoms*

	Miscarriage <sup>†</sup>			Pregnant			Community		
	B	SE B	β	B	SE B	β	B	SE B	β
Parent/Caregiver Deceased	7.8**	2.8	.3	1.2	1.9	.1	1.4	1.5	.1
	R <sup>2</sup> .25, p < .01			R <sup>2</sup> .28, p < .01			R <sup>2</sup> .14, p < .01		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

<sup>†</sup>At Time 1 Only; \*\* $p < .01$



Table 7b

*Multiple Regression Analysis for Parental/Caregiver Death Before and After Age Eighteen on Depressive Symptoms*

	Miscarriage <sup>†</sup>			Pregnant			Community		
	B	SE B	β	B	SE B	β	B	SE B	β
Parent/Caregiver Deceased Before 18	5.3	4.0	.1	12.3**	3.5	.2	2.3	1.8	.1
Parent/Caregiver Deceased After 18	2.8	3.0	.1	-.8	2.0	-.02	.4	2.0	.01
	R <sup>2</sup> .08, p > .05			R <sup>2</sup> .21, p < .01			R <sup>2</sup> .14, p < .01		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

<sup>†</sup>At Time 1 Only; \*\* $p < .01$

The interaction effect of miscarriage and parental or caregiver death on depressive symptoms was specifically assessed by a multiple regression analysis. The miscarriage and pregnant cohorts were dummy coded and used as covariates in the analysis; the non-pregnant/community cohort was consequently used as the comparison. In addition to age, level of education, race, marital status, income, and number of living children, variables included in the model were parent/caregiver death, miscarriage X parent/caregiver death, and pregnant X parent/caregiver death. As presented in Table 8a, while miscarriage, acting alone, was associated with more depressive symptoms ( $B= 6.8, p<.01$ ), miscarriage and parental or caregiver death, acting together, were not associated with significantly more depressive symptoms. The interaction terms (miscarriage X parent/caregiver death, and pregnant parent/caregiver death) were not significant at the less conservative significance level of  $p< .10$  either.

The interaction effect of miscarriage and parental or caregiver death prior to and after age eighteen on depressive symptoms was also assessed by a multiple regression analysis. As with the preceding analysis, the miscarriage and pregnant cohort were dummy coded and used as covariates in the analysis; the non-pregnant/community cohort was consequently used as the comparison. In addition to age, level of education, race, marital status, income, and number of living children, variables included in the model were parent/caregiver death before age eighteen, parent/caregiver death after age eighteen, miscarriage X parent/caregiver death before age eighteen, and pregnant X parent/caregiver death before age eighteen, miscarriage X parent/caregiver death after age eighteen, and pregnant X parent/caregiver death after age eighteen.

Table 8a

*Multiple Regression Analysis for Interaction of Miscarriage and Parental/Caregiver Death on Depressive Symptoms*

	B	SE B	$\beta$
Parent/Caregiver Deceased	1.7	1.4	.1
Miscarriage <sup>†</sup>	6.8**	1.6	.2
Pregnant	1.7	1.3	.1
Miscarriage <sup>†</sup> X Parent/Caregiver Deceased	3.1	2.7	.1
Pregnant X Parent/Caregiver Deceased	-1.1	2.4	-.03
$R^2 .22, p < .01$			

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K- \$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses; <sup>†</sup>At Time 1 Only; \*\* $p < .01$

As presented in Table 8b, while miscarriage, acting alone, was associated with more depressive symptoms ( $B= 9.0, p<.01$ ), miscarriage and parental or caregiver death before age eighteen, and miscarriage and parental or caregiver death after age eighteen, acting together, were not associated with significantly more depressive symptoms. The interaction terms (miscarriage X parent/caregiver death before age eighteen, and miscarriage X parent/caregiver death after age eighteen) were not significant at the less conservative significance level of  $p<.10$  either. On the other hand, pregnancy and parental or caregiver death before age eighteen, acting together, were associated with significantly more depressive symptoms ( $B= 8.8, p<.05$ ).

### **Parental or Caregiver Death and Grief**

Linear regression analyses were conducted to assess the effect of parental or caregiver death on grief in miscarrying women at two weeks, six weeks, and six months following the miscarriage event. Results for the effect of parental or caregiver death (not specifically prior to age eighteen) are presented in Table 9a. After controlling for age, level of education, race, marital status, income, and number of living children, miscarrying women with at least one parent or caregiver deceased did not report significantly more depressive symptoms than miscarrying women without a parent or caregiver deceased. Similarly, as presented in Table 9b, miscarrying women with at least one parent or caregiver deceased prior to age eighteen did not report significantly more depressive symptoms than miscarrying women without a parent or caregiver deceased prior to age eighteen at two weeks, six weeks, and six months following the miscarriage event.

Table 8b

*Multiple Regression Analysis for Interaction of Miscarriage and Parental/Caregiver Death Before and After Age Eighteen on Depressive Symptoms*

	B	SE B	$\beta$
Parent/Caregiver Deceased Before 18	2.5	1.9	.1
Parent/Caregiver Deceased After 18	.8	2.0	.02
Miscarriage <sup>†</sup>	9.0**	1.2	.3
Pregnant	.3	1.1	.01
Miscarriage <sup>†</sup> X Parent/Caregiver Deceased Before 18	.9	3.9	.01
Pregnant X Parent/Caregiver Deceased Before 18	8.8*	4.2	.1
Miscarriage <sup>†</sup> X Parent/Caregiver Deceased After 18	.7	3.2	.01
Pregnant X Parent/Caregiver Deceased After 18	-1.6	2.9	-.03
$R^2$ .22, $p < .01$			

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses; <sup>†</sup>At Time 1 Only; \*  $p < .05$ ; \*\* $p < .01$

Table 9a

*Multiple Regression Analysis for Parental/Caregiver Death on Grief at Three Time Points Following Miscarriage*

	Two Weeks			Six Weeks			Six Months		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Parent/Caregiver Deceased	3.5	2.5	.2	.9	1.5	.1	1.6	1.5	.1
	$R^2 .34, p < .01$			$R^2 .33, p < .01$			$R^2 .31, p < .01$		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

Table 9b

*Multiple Regression Analysis for Parental/Caregiver Death Before and After Age Eighteen on Grief at Three Time Points Following Miscarriage*

	Two Weeks			Six Weeks			Six Months		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Parent/Caregiver Deceased Before 18	2.4	3.4	.1	1.3	2.2	.04	-1.7	2.4	-.05
Parent/Caregiver Deceased After 18	2.6	2.6	.1	-.5	1.7	-.02	1.0	1.6	.04
	R <sup>2</sup> .26, p < .01			R <sup>2</sup> .27, p < .01			R <sup>2</sup> .24, p < .01		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

## **Moderating Effects**

As noted in the previous chapter, exploratory analyses were conducted to investigate the moderating effects of the subject's age when the first parent or caregiver died, gender of the deceased parent or caregiver, and having at least one living child on outcome variables of depressive symptoms and grief. Results from these analyses are presented below.

### **Subject Age When First Parent or Caregiver Died**

Linear regression analyses were conducted to assess the moderating effect of the subject's age when she experienced the death of the first parent or caregiver on depressive symptoms in miscarrying, pregnant and non-pregnant/community women. This moderating variable used age of the participant at the time of parental or caregiver death as a continuous variable (as opposed to categorically defined as less than or greater than eighteen). For this analysis, the earliest parental or caregiver death was used as the moderating variable without adjusting for how important or involved that parent or caregiver had been in the subject's life, or whether that parent or caregiver had been indicated as the primary caregiver. The analysis only included women with at least one deceased parent or caregiver but was not restricted to parental or caregiver death prior to age eighteen.

The results, presented in Table 10a, indicated that controlling for age, level of education, race, marital status, income, and number of living children, subject's age at the time when the first parent or caregiver died did not moderate the level of depressive symptoms in miscarrying, pregnant or non-pregnant/community women. However, the results generally indicated that among miscarrying, pregnant, and non- pregnant/



Table 10a

*Multiple Regression Analysis for Age at First Parent/ Caregiver Death on Depressive Symptoms*

	Miscarriage <sup>†</sup>			Pregnant			Community		
	B	SE B	β	B	SE B	β	B	SE B	β
Age When First Parent/Caregiver Died	-.02	.3	-.01	-.2	.17	-.2	-.09	.1	-.09
	$R^2 .39, p > .05$			$R^2 .40, p > .05$			$R^2 .28, p < .01$		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

<sup>†</sup>At Time 1 Only

community women, individuals whose parents or caregivers died when they were younger reported more depressive symptoms than those whose parents or caregivers died later.

It was necessary to clarify whether amount of time elapsed since the death of the parent or caregiver was a better indicator of depressive symptoms (as opposed to the subject's age at the time of parental or caregiver death). Linear regression analyses were conducted to assess the moderating effect of the amount of time elapsed since the death of the subject's primary parent or caregiver on depressive symptoms in miscarrying, pregnant and non-pregnant/community women. This moderating variable used the difference between the participant's age at the time of interview and her age when the primary parent or caregiver died; this value was used as a continuous variable. Only the parent or caregiver indicated as the primary parent (in response to the questions 'who raised you until you were eighteen,' and 'are they still living') was used in the analysis; the variable was not adjusted for the subject's closeness with the parent or caregiver or the latter's involvement in the subject's life. The analysis only included women with at least one deceased parent or caregiver but was not restricted to individuals with parental or caregiver death prior to age eighteen

Results, presented in Table 10b, indicated that controlling for age, level of education, race, marital status, income, and number of living children, amount of time elapsed since the death of the primary parent or caregiver did not moderate the level of depressive symptoms in miscarrying and non-pregnant/community women. However, in pregnant women the amount of time elapsed since the death of the primary parent or caregiver was significantly associated with depressive symptoms ( $B = .6, p < .05$ ).

Table 10b

*Multiple Regression Analysis for Time Elapsed Since Primary Parental/ Caregiver Death on Depressive Symptoms*

	Miscarriage <sup>†</sup>			Pregnant			Community		
	B	SE B	β	B	SE B	β	B	SE B	β
Time Elapsed Since Primary Parent/Caregiver Died	.001	.3	.001	.6*	.3	.4	-.1	.1	-.04
	R <sup>2</sup> .32, p > .05			R <sup>2</sup> .47, p < .05			R <sup>2</sup> .28, p < .01		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

<sup>†</sup>At Time 1 Only; \*p < .05

Specifically, among pregnant women, more time elapsed since the death of the primary parent or caregiver was associated with more depressive symptoms.

Similarly, linear regression analyses were conducted to assess the moderating effect of the subject's age when she experienced the death of the first parent or caregiver on grief in miscarrying women at two weeks, six weeks, and six months following the miscarriage event. As with the previous analysis, the earliest parental or caregiver death was used as the moderating variable without adjusting for how important or involved that parent or caregiver had been in the subject's life, or whether that parent or caregiver had been indicated as the primary caregiver. The analysis only included women with at least one deceased parent or caregiver but was not restricted to individuals with parental or caregiver death prior to age eighteen.

The results, presented in Table 11a, indicated that controlling for age, level of education, race, marital status, income, and number of living children, subject's age at the time when the first parent or caregiver died did not moderate the level of grief in miscarrying women at two weeks, six weeks, and six months after the miscarriage event. Broadly, trends in the data were inconclusive as miscarrying women at two weeks and six months following the miscarriage event reported more grief with later parental or caregiver death, while miscarrying women at six weeks following the miscarriage event reported more grief with earlier parental or caregiver death.

Table 11a

*Multiple Regression Analysis for Age at First Parent/ Caregiver Death on Grief at Three Time Points Following Miscarriage*

	Two Weeks			Six Weeks			Six Months		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Age When First Parent/Caregiver Died	.02	.2	.02	-.1	.1	-.2	.2	.1	.2
	$R^2 .56, p < .05$			$R^2 .48, p < .05$			$R^2 .61, p < .01$		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

In order to clarify whether amount of time elapsed since the death of the parent or caregiver was a better indicator of grief (as opposed to the subject's age at the time of parental or caregiver death), linear regression analyses were conducted to assess the moderating effect of the amount of time elapsed since the death of the subject's primary parent or caregiver on grief in miscarrying women at two weeks, six weeks, and six months following the miscarriage event. This moderating variable used the difference between the participant's age at the time of interview and her age when the primary parent or caregiver died; this value was used as a continuous variable. Only the parent or caregiver indicated as the primary parent (in response to the questions 'who raised you until you were eighteen,' and 'are they still living') was used in the analysis; the variable was not adjusted for the subject's closeness with the parent or caregiver or the latter's involvement in the subject's life. The analysis only included women with at least one deceased parent or caregiver but was not restricted to individuals with parental or caregiver death prior to age eighteen.

The results, presented in Table 11b, indicated that controlling for age, level of education, race, marital status, income, and number of living children, amount of time elapsed since the death of the primary parent or caregiver did not moderate the level of grief in miscarrying women at two weeks, six weeks, and six months following the miscarriage event.

Table 11b

*Multiple Regression Analysis for Time Elapsed Since Primary Parental/ Caregiver Death on Grief at Three Time Points Following Miscarriage*

	Two Weeks			Six Weeks			Six Months		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Time Elapsed Since Primary Parent/Caregiver Died	.1	.2	.1	.01	.2	.01	.1	.1	.1
	$R^2 .53, p < .01$			$R^2 .68, p < .01$			$R^2 .64, p < .01$		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K- \$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

† At Time 1 Only; \* $p < .05$

### **Gender of the Primary Deceased Parent or Caregiver**

Linear regression analyses were conducted to assess the moderating effect of the gender of the primary deceased parent or caregiver on depressive symptoms in miscarrying, pregnant and non-pregnant/community women. This moderating variable was created by collapsing disparate male and female parents or caregivers (as outlined in Table 4) into two categories that were subsequently contrast coded as 1 for all female parents or caregivers and -1 for all male parents or caregivers. Only the parent or caregiver indicated as the primary parent (in response to the questions ‘who raised you until you were eighteen,’ and ‘are they still living’) was used in the analysis; the variable was not adjusted for the subject’s closeness with the parent or caregiver or the latter’s involvement in the subject’s life. The analysis only included women with at least one deceased parent or caregiver but was not restricted to individuals with parental or caregiver death prior to age eighteen.

The results, presented in Table 12, indicated that controlling for age, level of education, race, marital status, income, and number of living children, gender of the primary deceased parent or caregiver did not moderate the level of depressive symptoms in miscarrying, pregnant or non-pregnant/community women. However, the results generally indicated that in miscarrying women, death of a male primary parent or caregiver was associated with more depressive symptoms than death of a female primary parent or caregiver. In contrast, in pregnant and non-pregnant/community women, death of a female primary parent or caregiver was associated with more reported depressive symptoms than death of a male primary parent or caregiver.



Table 12

*Multiple Regression Analysis for Gender of Primary Deceased Parent/Caregiver on Depressive Symptoms*

	Miscarriage <sup>†</sup>			Pregnant			Community		
	B	SE B	β	B	SE B	β	B	SE B	β
Gender of Primary Deceased Parent/Caregiver	-4.3	2.2	-.3	2.6	2.0	.2	.2	1.1	.01
	R <sup>2</sup> .48, p < .05			R <sup>2</sup> .39, p > .05			R <sup>2</sup> .28, p < .01		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

<sup>†</sup>At Time 1 Only

Similarly, linear regression analyses were conducted to assess the moderating effect of gender of the primary deceased parent or caregiver on grief in miscarrying women at two weeks, six weeks, and six months after the miscarriage event. This moderating variable was created by collapsing disparate male and female parents or caregivers (as outlined in Table 4) into two categories that were subsequently contrast coded as 1 for all female parents or caregivers and -1 for all male parents or caregivers. Only the parent or caregiver indicated as the primary parent (in response to the questions ‘who raised you until you were eighteen,’ and ‘are they still living’) was used in the analysis; the variable was not adjusted for the subject’s closeness with the parent or caregiver or the latter’s involvement in the subject’s life. The analysis only included women with at least one deceased parent or caregiver but was not restricted to individuals with parental or caregiver death prior to age eighteen.

The results, presented in Table 13, indicated that controlling for age, level of education, race, marital status, income, and number of living children, gender of the primary deceased parent or caregiver did not moderate the level of grief in miscarrying women at two weeks, six weeks, and six months after the miscarriage event. Broadly, trends in the data were inconclusive as miscarrying women at two weeks and six months following the miscarriage event reported more grief when the primary deceased parent or caregiver was male, whereas miscarrying women at six weeks following the miscarriage event reported more grief when the primary deceased parent or caregiver was female.

Table 13

*Multiple Regression Analysis for Gender of Primary Deceased Parent/Caregiver on Grief at Three Time Points Following Miscarriage*

	Two Weeks			Six Weeks			Six Months		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Gender of Primary Deceased Parent/Caregiver	-.2	2.0	-.02	.9	1.2	.1	-.4	1.4	-.1
	$R^2 .56, p < .05$			$R^2 .48, p < .05$			$R^2 .59, p < .01$		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

### **Presence of At Least One Living Child**

Univariate analysis of variance (2 X 2 ANOVA) was conducted to assess the moderating effect of having at least one living child on depressive symptoms in miscarrying, pregnant and non-pregnant/community women with and without parental or caregiver death. Each of the two independent variables had two categories: parent or caregiver deceased, and parent or caregiver alive; at least one living child, and no living children. The variables were dummy coded (1,0) to reflect the two levels of each variable.

With respect to the association of having at least one living child with depressive symptoms, the results (presented in Table 14a) were consistent with previously published results from the data used in this study (Neugebauer et. al., 1992); the presence of at least one living child significantly moderated depressive symptoms in miscarrying women ( $F(1, 90) = 5.5, p < .05$ ). The results also indicated that controlling for age, level of education, race, marital status, and income, the presence of at least one living child did not interact with parental or caregiver death to significantly moderate the level of depressive symptoms in miscarrying women. In contrast, in pregnant ( $F(1, 149) = 6.3, p < .01$ ) and non-pregnant/community women ( $F(1, 283) = 4.5, p < .05$ ), having at least one living child interacted with parental or caregiver death to significantly moderate depressive symptoms.

Similarly, univariate analysis of variance (2 X 2 ANOVA) was conducted to assess the moderating effect of having at least one living child on depressive symptoms in miscarrying, pregnant and non-pregnant/community women with parental or caregiver death before and after age eighteen. Each of the two independent variables had two

Table 14a

*Moderating Effect of At Least One Living Child on Depressive Symptoms*

	Miscarriage <sup>†</sup>				Pregnant				Community			
	SS	df	MS	F	SS	df	MS	F	SS	df	MS	F
Living Child	707.1	1	707.1	5.5*	25.4	1	25.4	.3	.3	1	.3	.003
Parent/Caregiver Deceased	898.2	1	898.2	7.0**	173.5	1	173.5	2.0	45.3	1	45.3	.4
Living Child X Parent/Caregiver Deceased	71.7	1	71.7	.6	558.6	1	558.6	6.3**	476.8	1	476.6	4.5*
Error	10152.3	79	128.5		12205.7	138	88.4		28669.9	272	105.4	
Corrected Total	13688.1	90			17643.4	149			33893.1	283		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+) were controlled for in all analyses; <sup>†</sup>At Time 1 Only \* $p < .05$ ; \*\*  $p < .01$

categories: parent or caregiver deceased prior to age eighteen, and parent or caregiver deceased after age eighteen; at least one living child, and no living children. The variables were dummy coded (1,0) to reflect the two levels of each variable.

The results, presented in Table 14b, indicated that controlling for age, level of education, race, marital status, and income, the presence of at least one living child did not interact with parental or caregiver death before and after age eighteen to significantly moderate the level of depressive symptoms in miscarrying, pregnant, or non-pregnant/community women.

Univariate analysis of variance (2 X 2 ANOVA) was conducted to assess the moderating effect of having at least one living child on grief at two weeks, six weeks, and six months following the miscarriage event in miscarrying women with and without parental or caregiver death. Each of the two independent variables had two categories: parent or caregiver dead, and parent or caregiver alive; at least one living child, and no living children. The variables were dummy coded (1,0) to reflect the two levels of each variable.

The results, presented in Table 15a, indicated that controlling for age, level of education, race, marital status, and income, the presence of at least one living child significantly moderated the level of grief in miscarrying women at six months following the miscarriage event ( $F(1, 99) = 5.0, p < .05$ ). However, in miscarrying women, the presence of at least one living child did not interact with parental or caregiver death to significantly moderate the level of grief at two weeks, six weeks, and six months following the miscarriage event.

Table 14b

*Moderating Effect of At Least One Living Child on Depressive Symptoms When Parent/Caregiver Died Before Age Eighteen<sup>¥</sup>*

	Miscarriage <sup>†</sup>				Pregnant				Community			
	SS	df	MS	F	SS	df	MS	F	SS	df	MS	F
Living Child	226.1	1	226.1	1.6	26.9	1	26.9	.3	276.9	1	276.9	2.9
Parent/Caregiver Deceased <sup>¥</sup>	85.0	1	85.0	.6	460.2	1	460.2	4.3*	60.9	1	60.9	.6
Living Child X Parent/Caregiver Deceased <sup>¥</sup>	63.5	1	63.5	.5	149.6	1	149.6	1.4	45.8	1	45.8	.5
Error	3209.9	23	139.6		2974.6	28	106.2		6683.5	69	96.9	
Corrected Total	5422.9	32			5440.0	39			9400.5	80		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+) were controlled for in all analyses; <sup>¥</sup>Parent/Caregiver deceased before age eighteen compared to Parent/Caregiver deceased after age eighteen; <sup>†</sup>At Time 1 Only; \* $p < .05$

Table 15a

*Moderating Effect of At Least One Living Child on Grief Across Time Following Parental/Caregiver Death*

	Two Weeks				Six Weeks				Six Months			
	SS	df	MS	F	SS	df	MS	F	SS	df	MS	F
Living Child	222.5	1	222.45	2.6	8.8	1	8.8	.2	202.1	1	202.1	5.0*
Parent/Caregiver Deceased	166.4	1	166.4	2.0	.1	1	.1	.003	30.2	1	30.2	.8
Living Child X Parent/Caregiver Deceased	17.6	1	17.6	.2	47.2	1	47.2	1.03	7.6	1	7.6	.2
Error	4688.0	55	85.2		3483.5	76	45.8		3539.5	88	40.2	
Corrected Total	7080.9	66			5291.1	87			5100.8	99		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+); <sup>‡</sup>Parent/Caregiver deceased before age eighteen compared to Parent/Caregiver deceased after age eighteen; \* $p < .05$



Similarly, univariate analysis of variance (2 X 2 ANOVA) was conducted to assess the moderating effect of having at least one living child on grief at two weeks, six weeks, and six months following the miscarriage event in miscarrying women with parental or caregiver death before and after age eighteen. Each of the two independent variables had two categories: parent or caregiver deceased prior to age eighteen, and parent or caregiver deceased after age eighteen; at least one living child, and no living children. The variables were dummy coded (1,0) to reflect the two levels of each variable.

The results, presented in Table 15b, indicated that controlling for age, level of education, race, marital status, and income, the presence of at least one living child did not interact with parental or caregiver death before and after age eighteen to significantly moderate the level of grief in miscarrying women at two weeks, six weeks, and six months after the miscarriage event.

### **Major Depressive Disorder**

A series of logistic regression analyses were conducted to assess the effect of parental or caregiver death on major depressive disorder in miscarrying women; non-pregnant/community women were used as controls. Incidents of major depressive disorder were measured as a categorical variable using the depression section of the DIS.

Appendix A indicates that only a small number of women in the miscarriage and non-pregnant/community cohorts with major depressive disorder also had at least one deceased parent or caregiver (7 women in the miscarrying cohort and 4 women in the non-pregnant/community cohort). Further, as Appendix B indicates, an even smaller number of women with major depressive disorder had at least one parent or caregiver

Table 15b

*Moderating Effect of At Least One Living Child on Grief Across Time When Parent/Caregiver Died Before Age Eighteen<sup>¥</sup>*

	Two Weeks				Six Weeks				Six Months			
	SS	df	MS	F	SS	df	MS	F	SS	df	MS	F
Living Child	50.8	1	50.8	.8	20.6	1	20.6	.6	.01	1	.01	0
Parent/Caregiver Deceased <sup>¥</sup>	42.9	1	42.9	.7	8.6	1	8.6	.3	30.1	1	30.1	1.0
Living Child X Parent/Caregiver Deceased <sup>¥</sup>	204.1	1	204.1	3.1	2.0	1	2.0	.1	45.9	1	45.9	1.5
Error	1108.6	17	65.2		751.2	23	32.7		685.9	22	31.2	
Corrected Total	3043.6	26			1412.5	33			1784.2	32		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+); <sup>¥</sup>Parent/Caregiver deceased before age eighteen compared to Parent/Caregiver deceased after age eighteen

deceased prior to age eighteen (3 women in the miscarrying cohort and 3 women in the non-pregnant/community cohort). After controlling for age, level of education, race, marital status, income, and number of living children, miscarrying women with parental or caregiver death prior to age eighteen were found to be approximately seven times as likely to have major depressive disorder as miscarrying women without a parent or caregiver deceased prior to age eighteen (Appendix D). No such relationship between parental or caregiver death and incidences of major depressive disorder was found among non-pregnant/community women. The relationship between parental or caregiver death and major depressive disorder in miscarrying and non-pregnant/community women was not moderated by the subject's age when the first parent or caregiver died or the gender of the primary deceased parent or caregiver.

While these findings are important, as noted above, only a small number of women in each cohort with major depressive disorder also had at least one deceased parent or caregiver, and an even smaller number of women with major depressive disorder had at least one parent or caregiver deceased prior to age eighteen. As a result inferences based on these analyses have low statistical power. For findings from analyses for major depressive disorder, interested readers are referred to Appendix A to H.

## Chapter 4

### DISCUSSION

Parental or caregiver death has been found to be associated with depressive symptoms (Gersten, Beals, & Kallgren, 1991). Several studies have specifically highlighted such a death in childhood as being a significant predictor of adult depression (Barnes & Prosen, 1985; Brown, 1966; Brown et. al., 1977; Hill & Price, 1967; Jacobs & Bovasso, 2009; Kunugi et. al., 1995). Miscarriage has similarly been associated with depressive symptoms (Beutel et. al., 1995; Stritzinger et. al., 1999) and grief (Cuisinier et. al., 1996; Lin & Lasker, 1996; Swanson et. al., 2007). Data used in the present study has also supported the association between miscarriage and several mental health outcomes, including depressive symptoms (Neugebauer et;. al., 1992), grief (Ritsher & Neugebauer, 2002), and major depressive disorder (Neugebauer et. al., 1997).

This study proposed to confirm previously found associations between parental or caregiver death and depressive symptoms and grief, and examine whether such an early loss compounds the emotional outcomes following a miscarriage. Study findings are discussed below; implications for research and clinical practice are outlined.

#### **Summary of Findings**

As previously noted, women in the miscarriage cohort were compared to pregnant and non-pregnant/community women. The miscarriage cohort was used to assess the impact of pregnancy loss on depression and as a trigger for grief reactions. The pregnant cohort was used to assess the level of depression in women with an uninterrupted pregnancy. The non-pregnant/community cohort was used to assess the level of

depression in women in the absence of any recent reproductive event. (Neugebauer, et. al., 1992, Neugebauer, et. al., 1997, Ritsher & Neugebauer, 2002).

### **Depressive Symptoms**

Results of this study show that miscarrying women with at least one parent or caregiver deceased reported more depressive symptoms than miscarrying women without a deceased parent or caregiver. However, parental or caregiver death did not interact with miscarriage to produce disproportionately more depressive symptoms than would arise otherwise owing to parental loss. Specifically, the difference in the level of depressive symptoms in miscarrying women with and without a history of parental or caregiver death was not greater than the difference in the level of depressive symptoms between pregnant and non-pregnant/community women with and without a history of parental or caregiver death.

When the effect of parental or caregiver death prior to age eighteen was specifically assessed, it was found to be significantly associated with more depressive symptoms in pregnant women. Further, pregnancy and parental or caregiver death prior to age eighteen interacted to produce more depressive symptoms. Specifically, the difference in the level of depressive symptoms in pregnant women with and without a history of parental or caregiver death prior to age eighteen was greater than the difference in the level of depressive symptoms between miscarrying and non-pregnant/community women with and without a history of parental or caregiver death prior to age eighteen. Parental or caregiver death (at any age as well as specifically prior to age eighteen) was not associated with depressive symptoms in non-pregnant/community women.

The discrepancy between miscarrying and pregnant women on the issue of age at the time of parental or caregiver death was puzzling. In order to closely examine this finding, the participant's age at the time of parental or caregiver death was specifically assessed as a moderator of depressive symptoms in miscarrying, pregnant, and non-pregnant/community women with parental or caregiver death. Age when the first parent or caregiver died was not found to be associated with depressive symptoms in miscarrying, pregnant, or non-pregnant/community women.

The preceding analysis did not take into consideration the amount of time that had elapsed since the parent or caregiver died. It was considered that perhaps an individual who had lost a parent or caregiver earlier in life would report less depressive symptoms as she had more time to cope with the death. As the measure of time elapsed since the parent or caregiver's death was obtained by subtracting subject's age at the time of parental or caregiver death from subject's age at the time of the interview, it was also a measure of the time elapsed between the parent or caregiver's death and the miscarriage event in miscarrying women and current pregnancy in pregnant women. In controlled analyses, time elapsed since the primary parent or caregiver died was found to have no effect on depressive symptoms in miscarrying and non-pregnant/community women, but was significantly associated with more depressive symptoms in pregnant women. Specifically, pregnant women with more time elapsed since the death of the primary parent or caregiver reported more depressive symptoms than pregnant women with less time elapsed since parental or caregiver death. In other words, pregnant women who lost a parent or caregiver closer to the onset of their pregnancy reported less depressive symptoms than pregnant women who lost a parent or caregiver earlier in life.

Gender of the primary deceased parent was not associated with depressive symptoms in miscarrying, pregnant or non-pregnant/community women. In general, the trends were inconclusive as miscarrying women reported more depressive symptoms following paternal death and pregnant and non-pregnant/community women reported more depressive symptoms following maternal death.

Having at least one living child was found to moderate depressive symptoms in pregnant and non-pregnant/community women with parental or caregiver death compared to their counterparts without parental or caregiver death. However, the presence of a living child was not a significant moderator of depressive symptoms in pregnant women whose parent or caregiver died prior to age eighteen (compared to those with parental or caregiver death after age eighteen). This may underscore the severity of the depressive symptoms reported by pregnant women with parental or caregiver death prior to age eighteen. Possible explanations for these findings are discussed below.

### **Grief**

Previous findings from the data used in the present study have found a significant relationship between miscarriage and grief (Ritsher & Neugebauer, 2002). In the present study, there was a significant difference in the mean grief scores six months following the miscarriage event between miscarrying women with parental or caregiver death before and after age eighteen at  $p < .05$ . However, a post-hoc Bonferonni correction was applied for three tests and no significance was found at  $p < .02$ . As some of the women interviewed at six months were also interviewed at two weeks and six weeks, the Bonferonni correction was necessary to control for multiple-treatment interference (Campbell & Stanley, 1963). In accord with the corrected result, parental or caregiver

death was not significantly associated with grief in miscarrying women at two weeks, six weeks, and six months following the miscarriage event. Further, none of the moderating variables that were studied (age at the time of the first parent or caregiver's death, time elapsed since the first parent or caregiver died, gender of the deceased parent or caregiver, and having at least one living child) were significantly associated with increased or decreased grief in miscarrying women at two weeks, six weeks, and six months after the miscarriage event. Given the lack of any association between perinatal grief and parental or caregiver death, the remaining discussion will focus on the outcome of depressive symptoms.

### **Sequelae of Loss**

The findings discussed above represent new associations between parental or caregiver death and emotional reactions to subsequent life events such as miscarriage. They underscore the profound impact of early parental or caregiver death on an individual's life. However, the argument being made is not that "misery has to have sequelae" (Harris, 1999, p 301), or that women with parental or caregiver death (in childhood or otherwise) are doomed to a life of depression. Rather, the findings suggest that an individual who has experienced a profoundly disturbing loss in the form of the death of a parent or caregiver, experiences greater depression when hit by a second loss in the form of a miscarriage. It is further notable that parental or caregiver death was a significant predictor of depressive symptoms in miscarrying women when sociodemographic variables of age, race, income, education, and marital status were controlled for. The impact of parental or caregiver death controlling for sociodemographic variables in this study is in contrast to previous studies (Bifulco et. al.,



1987; McLeod, 1991) that explain the association between parental or caregiver death and adult depression in the context of subsequent social and financial impact.

### **Loss Events or Life Events**

Thus far, the discussion has attempted to illuminate the association between parental or caregiver death and miscarriage as two loss events. However, while the findings with miscarrying women with and without parental or caregiver death confirm the study's main hypothesis, they must be interpreted in the context of the findings with pregnant women with and without parental or caregiver death. As noted above, pregnant women with a parent or caregiver deceased prior to age eighteen reported more depressive symptoms than pregnant women without a parent or caregiver deceased before age eighteen. Parental or caregiver death prior to age eighteen also interacted with pregnancy such that the difference in the level of depressive symptoms reported by pregnant women with or without parental or caregiver death prior to age eighteen was greater than the difference in the level of depressive symptoms reported by miscarrying and non-pregnant/community women with or without parental or caregiver death prior to age eighteen.

The association of pregnancy and parental death with depressive symptoms has been previously described by Kitamura, Sugawara, Sugawara, Toda and Shima (1996) who found that childhood parental or caregiver death was related to depression in pregnant women. Kitamura et. al. (1996) studied depression in pregnancy among women in Japan and found parental death before the subject's sixteenth birthday to be significantly associated with depression, with the strongest predictor being father death.

The authors suggested that this relationship may be mediated by lack of paternal or maternal care in the subject's childhood and youth.

Although the association between pregnancy and parental or caregiver death was not the original focus of this study, the findings with the pregnant cohort necessitate the interpretation of results from both the miscarriage and the pregnant cohorts in the context of significant life events rather than loss events. This is particularly underscored by the lack of any association between parental or caregiver death and depressive symptoms in non-pregnant/community women. Perhaps it is the imminent (and failed, in the case of miscarrying women) foray into parenthood that triggers memories of one's own deceased parents. As a woman stands on the threshold of parenthood, perhaps she looks back and remembers the parent whom she has lost, and who may have been her only true template for parenting.

### **Depression, and Reminders of Parents or Caregivers**

This portrayal of parents and caregivers as central figures, playing an important role in an individual's life, is not new to the field of psychology. The primary caregiver has been conceptualized as the love object by several thinkers (Brenner, 1974; Mitchell & Black, 1995), who have emphasized the importance of an individual's attachment to her caregivers in guiding her sense of being in the world. In his seminal theory of human attachment, John Bowlby outlined the notion of internal working models developed in childhood whose quality is determined by the nature of the relationship to the attachment figure (Shear & Shair, 2005). The internal working models contain information about attachment relationships, guide other interactions, and inform sense of self and relationships generally; they may also contain schemas that guide the individual's

expectations for caregiving under stress (Shear et. al., 2007). It follows from these notions that the loss of a primary love object, a parent or caregiver, may entail profound psychic disruptions. Early loss of the love object has been outlined in the founding theories of psychology as an explanatory model for depressive symptoms in adulthood; several possible dynamics have been proposed.

**Identification with the deceased.** Freud proposed that the death of a love object can lead to an individual's identification with the object and that such identification may play a role in depression (Brenner, 1974). A miscarrying or pregnant woman may have similarly identified with her deceased parent following his/her death. Even if the woman was not aware of this identification over the course of her life, she may be reminded of her likeness to her deceased parent as she herself faces parenthood. Identification with the deceased parent or caregiver may also manifest through worries about not surviving long enough to see one's own children into adulthood. Such identification with the parent or caregiver may contribute to her feelings of depression. Dynamics of identification with the deceased may underlie perceived vulnerability to future losses (discussed in the introductory chapter) that Mireault and Bond (1992) described as the crucial difference between individuals with and without early parental or caregiver death.

**Introjection.** Other psychodynamic thinkers have framed an individual's reaction to the death of a love object in terms of introjection. McWilliams (1994) explains that we introject the representations of individuals with whom we are deeply attached, rendering them a part of our own identity. We express this introjection with labels such as 'wife,' 'sister,' and 'daughter.' When death separates us from the individuals whose image we have internalized, we not only experience our environment as poorer, but also feel

ourselves diminished (McWilliams, 1994; McWilliams, 1999). In some individuals, McWilliams (1994) describes a preoccupation with figuring out what one did wrong and how the lost one can be brought back. It follows that a miscarrying or pregnant woman, regardless of whether she lived her life acutely aware of the label of 'daughter,' may become more aware of her deceased parent's contribution to her identity when confronted with the label of 'mother.' In other words, as she mulls over her own brush with/acceptance of the label, she may remember her own deceased mother. If this renewed awareness is accompanied by a sense of being herself diminished, depression may result (McWilliams, 1999).

**Attachment disruptions.** Attachment theory can also be used as an explanatory model for depressive symptoms following miscarriage and during pregnancy in women with a deceased parent or caregiver. It is generally supported that attachment patterns of early childhood are likely to inform individual behavior later in life (Blaffer Hrdy, 1999). In underscoring the power of human attachment, John Bowlby emphasized the idea that early attachment disruptions, through discontinuities in parenting such as parental death, have an impact in adult life. He particularly noted the association between an individual's experiences with her parents and her future capacity to make affectional bonds (Bowlby, 1977). A pregnant woman with parental or caregiver death may become aware of such attachment disruptions in her childhood during her current pregnancy as she forms an affectional bond with her own child. A miscarrying woman with parental or caregiver death may become similarly aware of attachment disruptions in her childhood as she grieves the disruption of her own affectional bond with her lost baby.

Other theorists have suggested that attachment disruptions through death are likely to require changes to one's internal mental models; such changes may not occur quickly (Shear & Shair, 2005). There are likely to be variations in how long it takes an individual to adjust to attachment disruptions caused by parental or caregiver death and how well she does so; yet, it should be noted that a miscarrying or pregnant woman with a deceased parent or caregiver may be working through the impact of this early trauma during her pregnancy or following her miscarriage.

Such an ongoing impact of attachment disruptions in bereaved individuals has been elucidated by Shear et. al. in the context of acute grief. In explaining acute grief in bereaved individuals, Shear et. al. (2007) described that an unrevised working model of the attachment with the deceased can lead to a continued presence of the deceased in an individual's life. The authors added that bereaved individuals experience a strong sense of yearning and longing for the deceased, as well as thoughts and memories of the late loved one. Viorst (1986) described this type of reaction as being stuck in the mourning process. A miscarrying or pregnant woman who is experiencing ongoing yearning for her deceased parent may find her sense of longing for the deceased parent or caregiver rekindled following her miscarriage or during her pregnancy. This may incite new feelings of depressiveness.

**Confronting avoided emotions.** Individuals may experience ongoing mourning for their deceased parent or caregiver if they have persistently avoided reminders of their loss. Avoidance behaviors may include refraining from activities that she enjoyed with the deceased loved one for fear of intensifying feelings of yearning (Shear et. al., 2007). In other subjects, such avoidance has been found to get in the way of adjustment (Shear

et. al., 2007). This may be particularly important in miscarrying or pregnant women, as those who have avoided mourning their deceased parent or caregiver may become depressed if their own pregnancy and/or miscarriage disrupts this pattern of avoidance, effectively forcing them to confront their feelings for the deceased.

**Taking on the caregiver role.** Parental or caregiver death may also be important in an individual's life in terms of its implications for the individual's sense of caring and being cared for. Shear et. al. (2007) cite evidence that, in adult relationships, one's sense of well being is more associated with being a caregiver than being cared for. Consequently, the death of an attachment figure is perceived as a failure of caregiving. Such a view of the self as a failed caregiver may be particularly important to explain the depression experienced by a pregnant woman, as noted earlier, who may worry that should she herself die she would fail in the role of caring for her own child. Among miscarrying women, the potential for viewing oneself as a failed caregiver following the loss of the child, may be even more.

### **Parental or Caregiver Death in Childhood**

The theories outlined above explain the associations between parental or caregiver death and depressive symptoms in miscarrying and pregnant women. However, the significant association that this study found between depressive symptoms and parental or caregiver death specifically prior to age eighteen in pregnant women must be addressed.

Bowlby argued that a child's attachment to the mother is instinctual and primary; he posited that early loss of the mother results in true mourning (Mitchell & Black, 1995). Other studies of parental death have similarly emphasized the profound impact of

childhood parental death on adult depression (Barnes & Prosen, 1985; Brown, 1966; Brown et. al., 1977; Hill & Price, 1967; Jacobs & Bovasso, 2009; Kunugi et. al., 1995;). As noted earlier, Kitamura et. al. (1996) found childhood parental or caregiver death to be associated with depressive symptoms in pregnant women. It is possible that disruptions in the women's early attachment patterns also explain the present study's findings that parental or caregiver death prior to age eighteen is significantly associated with depression in pregnant women.

The role of early object loss in adult depression may also be understood through psychoanalytic explanations of reactions to trauma. Boulanger (2002) describes that a child reacts to trauma by forming split-off self states that contain the traumatic self and object representations, engaging with the world through other self-states. Through this process, the child's mental structure and subsequent dealings with the world always include the traumatic experience. Further, Boulanger (2002) contends that memories of the trauma specifically manifest in the context of object relations particular to the traumatized self-state. In this way, childhood trauma becomes a part of the self.

While Boulanger (2002) is primarily concerned with childhood sexual trauma, her ideas may explain the present study's findings with pregnant women as well. Specifically, a pregnant woman who has suffered the traumatic death of a parent or caregiver in childhood may have coped with the loss by splitting off her feelings related to this trauma. Through her life she may have continued to engage the world through other self-states; these interactions would bear the thumbprint (Boulanger, 2002) of her early parental or caregiver death. Further, her memories of her parent or caregiver's death may manifest in the context of her pregnancy, a self-state containing object relations

similar to the ones she shared with her deceased parent or caregiver. In this manner, this study's findings of depression in pregnant women with early childhood death of a parent or caregiver may be explained through a domino effect (Boulanger, 2002) stemming from a traumatized self-state.

As outlined above, both early attachment disruptions as well as early response to the traumatic childhood parental or caregiver death explain the present study's findings of depression in pregnant women with parental or caregiver death prior to age eighteen. However, conclusive statements about such associations cannot be made at the present time as the pregnant group in the analyses comprised of a small number of women; this limitation is discussed in greater detail below.

### **Time Does Not Heal Wounds**

Discussion of early and later parental or caregiver death raises the issue of the amount of time it takes an individual to cope with and adjust to the loss of an attachment figure. In light of proposed variability in such coping (Shear & Shair, 2005), it was considered important to examine the impact of the amount of time elapsed since the death of a woman's first parent or caregiver. This factor was found not to be significantly associated with depressive symptoms in miscarrying women. Further, in pregnant women, those who have lost a parent or caregiver in childhood were more depressed than those who have lost a parent or caregiver later in life. Having time pass since the death of a parent or caregiver does not significantly mitigate the depression experienced by a miscarrying woman; it further appears to make the depression of a pregnant woman worse. This underscores the impact of early loss. It also further suggests that pregnancy rekindles identifications, introjections, and disruptions to internal working models in



women with childhood parental or caregiver death, that goes above and beyond any coping that these women may have done since the parent or caregiver died. Perhaps the emerging dynamics of a pregnancy render moot a life's worth of coping.

### **Why Gender of Deceased Parent Does Not Matter**

Thus far, the dynamics at play in this discussion have been framed in the context of a pregnant or miscarrying woman's identification with the deceased parent or caregiver; this immediately suggests the assumption of female caregivers as being the more likely recalled objects. Such an assumption would not be culturally unfounded either. In her path breaking book, Carol Gilligan characterized pregnancy as representing a woman's ability to assume the feminine role (Gilligan, 1993). However, findings of the present study do not support such a singular influence of femininity on the emotional state of a pregnant or miscarrying woman. Gender of the deceased parent or caregiver did not significantly moderate the relationship between parental or caregiver death and depressive symptoms in miscarrying or pregnant women. In fact, a review of trends in the data suggest that while in pregnant women, more depressive symptoms were associated with deceased female caregivers, in miscarrying women more depressive symptoms were associated with deceased male caregivers.

The inconclusiveness of these findings matches that of findings from other studies that have attempted to compare the importance of mother and father death on depressive symptoms. Father death (Barnes & Prosen, 1985; Hill & Price, 1967; Jacobs & Bovasso, 2009; Kitamura et. al., 1996) and mother death (Kunugi et. al., 1995) have been variably emphasized in studies thus far. These findings, as well as findings from the present study underscore the importance of taking into account individual, cultural, and environmental

factors in a discussion of the variable impact of male versus female caregivers in an individual's life. For example, two studies from Japan with opposing findings for father and mother death explained their findings by noting sociocultural characteristics of Japanese society. Kitamura et. al. (1996) proposed that childhood death of the father may be more associated with depression in pregnant Japanese women as lack of paternal care may be accompanied by economic hardships. In contrast, Kunugi et. al. (1995) explained that childhood death of the mother may be more associated with depression in Japanese women as the mother assumes most of the childrearing responsibilities in Japanese society.

In interpreting the findings of the present study with regard to gender of the deceased parent, it is important to similarly consider the sociocultural, as well as political, role of mother versus father in American society. Discrepancy in the earning power of mother and father is a factor that several studies have outlined. For example, Jacobs and Bovasso (2009) explained that father death prior to 1960 (as may have been the case for some of the participants in the present study with father death in early childhood) may be associated with depressive symptoms due to the difference in income between men and women. Perhaps economic hardships underlie the finding of more depressive symptoms associated with father death in miscarrying women who were poorer than women in the pregnant and non-pregnant/community cohorts.

Given that the sample in the present study was largely comprised of Hispanic women from poor families, it is important to frame the analysis of results pertaining to the gender of the deceased parent in the context of poor, perhaps largely immigrant, Hispanic homes in New York City in the late 1980s. Broadly speaking, gender and

gender roles are understood uniquely in Latin American families. For example, women are generally expected to be subservient and not interested in decisions beyond the home (Pick, Contreras, & Barker-Aguilar, 2006). Ideas such as Marianismo, may critically influence a young Latina's self-concept (Fernandez, 2006); it may also impact her surviving mother's ability to assume the role of the family's breadwinner. Such cultural characteristics may influence how the death of a father versus the death of a mother was processed by the family at large, and the children in particular. It also likely impacts the emerging emotional, financial, and cultural identity of a young Latina girl in New York City in the late 1980s. These factors, among others, may affect the depressiveness following mother or father death reported by a participant in the present study.

### **The Role of Living Children**

An individual's present status as a parent is also a significant factor to be considered in this discussion. Parenthood can be understood as a developmental stage, where reasonably negotiating and performing the parenting role can provide fulfillment for the parent, and excessive demands from children can lead to a devastating sense of failure (Siskind, 1997). Other findings with miscarrying women suggest that parenthood may have protective properties with regard to the mother's mental health; new pregnancies and births following the miscarriage event have been shown to be associated with declining grief scores (Cuisinier et. al., 1996; Lin & Lasker, 1996). Given the magnitude of this factor, it appeared prudent to include the number of living children a woman has in assessing her depression following a miscarriage or during pregnancy.

While previous findings from data used in the present study have similarly found living children to be a protective factor against major depressive disorder in miscarrying

women (Neugebauer et. al., 1997), findings from the present study revealed that having a living child does not moderate depressive symptoms associated with parental death before age eighteen. This finding must also be interpreted in the context of individual, sociocultural, and environmental factors: the miscarrying or pregnant woman's relationship with her children; the emotional and/or financial demands that her children place on her; her desire for another child; do her present children remind her of her deceased parent or caregiver, did she experience similar feelings during her pregnancy with her previous children; what sociocultural expectations around mothering are at play; what are the resources available to mothers in the woman's sociopolitical and cultural context. Without such information it is difficult to thoroughly assess how the number of children she has affects the psychic dynamics of a miscarrying or pregnant woman with a deceased parent or caregiver.

### **Implications of Findings**

The present findings with pregnant and miscarrying women make important contributions to existing literature on the emotional states of women during pregnancy and following miscarriage; potential for these findings to impact clinical work with these populations is discussed below.

### **Furthering Knowledge about the Emotional State of Miscarriage and Pregnancy**

Several studies, including previous findings from data used in the present study, have proposed the emotional impact of miscarriage (Beutel et. al., 1995; Cuisinier et. al., 1996; Lin & Lasker, 1996; Neugebauer et. al., 1992; Neugebauer et. al., 1997; Ritsher & Neugebauer, 2002; Stritzinger et. al., 1999; Swanson et. al., 2007). The impact of emotional distress on a woman during pregnancy is increasingly acknowledged in

research and clinical practice. Depressive symptoms are experienced by approximately 13% of pregnant women (Kim, Reardon, & Epperson, 2010). Antepartum depression is associated with increased risk for poor health habits during the pregnancy as well as high risk for medical, school, and psychiatric problems in the children of depressed mothers (Weissman, Markowitz, & Klerman, 2000). The need for clinical attention to women during pregnancy has been well established (Kim et. al., 2010; Kitamura et. al., 1996).

Findings from the present study add an important layer of information to research that is presently available about miscarrying and pregnant women. Specifically, the present study contextualizes a woman's depression following miscarriage and during pregnancy in the context of her whole life, and emphasizes the importance of incorporating contextual factors when interpreting her level of distress during pregnancy or following a miscarriage.

### **Clinical Implications**

As noted above, previous findings of depression during pregnancy and following miscarriage underscore the need for consistent psychological attention to this population. Ideally, support should be multi-disciplinary involving appropriate monitoring and care from all clinicians involved (including psychologists, psychiatrists, primary care physicians, obstetricians and gynecologists, and nurse practitioners). In fact, in keeping with emerging support for depression during pregnancy, the American Psychiatric Association recommends that psychotherapy be recommended for pregnant women with a diagnosis of depression (Kim et. al., 2010). The guidelines add that while many pregnant women are likely to prefer psychotherapy to pharmacological treatment, referred patients should be monitored for the necessity of medication. Studies of

treatment efficacy for antepartum depression have produced promising results; for instance, interpersonal psychotherapy (IPT) has been found to be an efficacious intervention for antepartum depression (Weissman et. al., 2000).

Findings from the present study provide information that may be useful to all treating clinicians. For example, clinicians working with pregnant patients, as well as with patients who have recently miscarried, may enquire about the patient's history of caregiver death while assessing the level or intensity of the patient's depression. In the event that a pregnant or miscarrying patient has experienced the death of a parent or caregiver, the clinician may incorporate an analysis of the patient's identification with, and attachment to, the deceased into the treatment plan. Such a contextualization of the patient's present depression in the context of her earlier loss may facilitate movement toward a more holistic treatment course in subsequent therapeutic care. It may also allow to fully explore the dynamics of her distress during pregnancy or following miscarriage.

### **Limitations**

While the present study adds valuable new information to the literature on depressive symptoms following parental or caregiver death, as well as to the literature on depressive symptoms following miscarriage and during pregnancy, there are several limitations to the data that must be considered prior to any application of the findings.

### **Sample Considerations**

Findings with miscarrying and pregnant women in the present study are based on analyses with a small sample of women from a specific sociocultural group. There were very few women with a parental or caregiver death who also had valid responses on the CES-D. Even fewer women (13 in the miscarriage cohort and 9 in the pregnant cohort)

with valid CES-D responses also had a parental or caregiver death prior to age eighteen. These samples are not large enough to warrant generalizing the findings of the present study to most pregnant and miscarrying women.

Another caveat to consider prior to interpreting findings is the sociocultural diversity of the study sample. The sample used in the present study is largely comprised of poor, Hispanic women from lower socioeconomic classes in New York City. While the sample's diversity allows for the exploration of cultural nuances, it may limit generalizability of the results. Several sociocultural factors specific to this group may explain the findings; similar results may not exist in other sociocultural groups. Application of these findings with other populations must take this factor into consideration.

Similarly, findings from the present study are based on data collected in the late 1980s in an urban neighborhood in New York City. Over the course of the last two decades since the data was collected, the social, cultural, and political fabric in this part of the world has undergone several changes. Present day populations in the same catchment areas may report different emotional responses to parental or caregiver death as well as pregnancy and miscarriage. Application of findings from the present study to current populations must take into consideration the amount of time that has elapsed since the data was collected.

### **Questions Not Specific to Parental or Caregiver Death**

The variable used to assess parental or caregiver death in the present study involved a relatively short list of questions probing into the individual's history with respect to parental relationships. The impact of parental or caregiver death on depressive

symptoms was not the focus of the original data collection process. As a result, specific probes into the nature of the individual's relationship with her deceased parent or caregiver, as well as an assessment of her identification with, and attachment to said parent or caregiver was not available. Information about the quality of care provided by subsequent caregivers following the demise of the primary caregiver was also not obtained. As discussed in the introductory chapter, several studies have proposed that childhood parental death must be understood as a vulnerability factor that compromises the individual's care (Bifulco et. al., 1987; Brown et. al., 1977; Roy, 1978). Information about the nature of the individual's relationship to the deceased parent or caregiver, as well as the quality of care she received from subsequent caregivers would have provided rich nuances to the study's findings; it would have also allowed for more sound theoretical underpinnings.

The importance of having such information has been emphasized by other authors who have proposed that in order to attribute the impact of the death of a loved one (such as a parent or caregiver) to an attachment disruption, it is important to know the attachment style of the individual, as well as the relationship with the deceased (Shear & Shair, 2005). In fact, Bowlby proposed a distinction in emotional outcome based on different attachment styles with the deceased caregiver. Specifically, he distinguished between mourning that results from the permanent loss of the love object, and disordered mourning that results from loss of an object to whom the individual has an anxious attachment with a history of discontinuities (Altman, Briggs, Frankel, Gensler, & Pantone, 2002). Conclusions about the impact of parental or caregiver death following



miscarriage or during pregnancy would be stronger when based on results where variations in attachment style have been controlled.

### **Factors that Affect Coping**

In addition to information about the individual's relationship to the deceased parent or caregiver, other noteworthy factors exist that are important to consider. For example, following a parent or caregiver's death, it is important to know how the family system, and sociocultural system at large, responds to the inevitable disruption and restructuring, and what resources are available in this regard (Sandler, Wolchik, Davis, Haine, & Ayers, 2003). Individual level efficacy in coping is also an important factor to consider (Sandler et. al., 2003). Similarly, it is important to note how the death was handled by the surviving parent or caregiver. Following childhood parental or caregiver death, the child has to live with the surviving parent, and may often find herself in the role of taking care of this parent through a period of grief and despair (Mackinnon, Michels, & Buckley, 2006). All of these factors can play a part in shaping the individual's appraisal of the parent or caregiver's death and the impact that it can have on her subsequent functioning following a miscarriage, during pregnancy, and in life in general.

### **Parental Mental Illness Could Be Worse Than Parental Death**

Although findings from the present study illuminate the impact of parental or caregiver death on depressive symptoms in miscarrying and pregnant women, it may be reasonably argued that having no parent or caregiver may cause an individual less emotional harm than having a parent or caregiver who is severely mentally ill. Several theorists across various schools of thought have linked depression to mental illness in the

individual's parents (McWilliams, 1994; Sandler et. al., 2003; Weissman et. al., 2000). Hill and Price (1967) have also suggested that depression resulting from parental suicide must be interpreted as indicative of the genetic etiology of the disorder. This study did not incorporate an assessment of the mental and psychological functioning of the deceased parent or caregiver. In light of previous findings, it is important to interpret results from the present study with caution. It is similarly important, in future studies, to include parental mental illness in the general understanding of the deceased parent or caregiver's impact on an individual's life.

### **Future Directions**

The present study illuminated the association between parental or caregiver death and depressive symptoms in miscarrying and pregnant women. Future research with similar populations can focus on other important outcomes of parental or caregiver death. For example, exploratory analyses in the present study revealed that miscarrying women with a parent or caregiver deceased before the age of eighteen were approximately seven times as likely to report major depressive disorder than miscarrying women without a parent or caregiver deceased prior to age eighteen. Despite its powerful implications, this finding was not discussed in detail as it was based on the responses of only three study participants (individuals who had positive responses on the DIS, and also had a parent or caregiver deceased prior to age eighteen). However, this finding underscores the importance of thoroughly investigating incidents of major depressive disorder in pregnant and miscarrying women with parental or caregiver death. Analysis of major depressive disorder as an outcome of parental or caregiver death in miscarrying and pregnant women

would make a vital contribution to research on parental or caregiver death as well as miscarriage and pregnancy.

Bowlby outlined the possibility of anxiety in adulthood and adolescence resulting from attachment disruptions in childhood; he specified that this anxiety is associated with the fear of losing the attachment figure (Bowlby, 1977). He further proposed that all anxiety is rooted in early anxiety about separation from the object of attachment (Mitchell & Black, 1995). Similarly, it has been suggested that the death of a loved one can profoundly impact an individual's fear dynamics; fear can be activated, its threshold can be lowered, and its intensity can be increased (Shear & Shair, 2005). These findings offer support for investigations into anxiety as a possible outcome of parental or caregiver death. Given, the findings of the present study, as well as the established comorbidity of depression and anxiety (American Psychiatric Association [DSM-IV-TR], 2000) it appears particularly relevant to examine anxiety in pregnant women with a deceased parent or caregiver.

Finally, the present study found no association between parental or caregiver death and perinatal grief in miscarrying women. However, a distinct grief reaction, complicated grief, has been suggested as an outcome of bereavement; it has been found to be characteristically different from other bereavement related emotional distress such as depression and anxiety (Prigerson et. al., 1996). People who suffer from complicated grief experience disbelief regarding the death of their loved one (Shear & Shair, 2005), They report ongoing difficulty coming to terms with the death, and experience an array of intense emotions including yearning and longing for the deceased (Shear et. al., 2007). While parental or caregiver death was not associated with grief regarding the lost

pregnancy or lost baby in the present study, an investigation into complicated grief in response to parental or caregiver death in miscarrying and pregnant women may produce important results. Longitudinal analyses of this outcome in bereaved individuals may offer insights into how people cope with parental or caregiver death over the course of their life as well as in the context of miscarriage and pregnancy. Findings from such studies may hold promise for the understanding and treatment of child and adult psychopathology, as well as the psychological dynamics of pregnancy and miscarriage.

### **Conclusions**

The *Wall Street Journal* article described in the introductory chapter quoted Ms. Hughes, a mother of two who had lost both her parents before her thirteenth birthday. She reported heaving a sigh of relief upon turning 46-years-old. Her mother had died at age 44-years-old, followed by her father who died when he was 45-years-old. Ms. Hughes poignantly stated that she “had to live to 46 to break the curse” (Zaslow, 2010).

This excerpt captures the lasting impact of early parental death on an individual’s life; it reveals that individuals with parental or caregiver death often struggle for several years to cope with the loss. They may carry anxieties related to the death of their parent into other relationships, particularly those with their children.

The present study illuminates the distressing emotional ramifications of a woman’s journey into and/or loss of parenthood (through pregnancy and/or miscarriage) when it unfolds in the context of her own parental loss. Women with a deceased parent or caregiver are more depressed following a miscarriage or during a pregnancy than their counterparts whose parents or caregivers are not deceased. In other words, the impact of one loss is large enough; it becomes even greater in the context of life’s complexities.

Findings from the present study provide support for all clinicians (including psychologists, psychiatrists, primary care physicians, obstetricians and gynecologists, and nurse practitioners) working with miscarrying and pregnant women to specifically enquire about the patient's history of early parental or caregiver death in their assessment of her current distress. The present study also underscores the need to investigate early losses, and their role in shaping an individual's emerging self and ability to cope with subsequent stress. Further study of miscarrying and pregnant women must specifically examine parental or caregiver death, in childhood and adulthood, to thoroughly investigate the association between these two powerful life events.

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APPENDICES

Appendix A

*Major Depressive Disorder in Women With and Without Parental/Caregiver Death*

	Miscarriage		Community	
	MDD (+)	MDD (-)	MDD (+)	MDD (-)
Parent/Caregiver Deceased	7	46	4	82
Parent/Caregiver Alive	11	98	6	198

Appendix B

*Major Depressive Disorder in Women With and Without Parental/Caregiver Death Before and After Age Eighteen*

	Miscarriage		Community	
	MDD (+)	MDD (-)	MDD (+)	MDD (-)
Parent/Caregiver Deceased Before 18	3	16*	3	44*
Parent/Caregiver Deceased After Eighteen	4	30	1	38

\* $p < .05$

Appendix C

*Logistic Regression Analysis for Parental/ Caregiver Death on Major Depressive Disorder*

	Miscarriage			Community		
	Wald	Exp(B)	Exp(B)-95%CI	Wald	Exp(B)	Exp(B)-95%CI
Parent/ Caregiver Deceased	1.0	1.8	.6-5.5	.1	1.2	.3-4.9
	Cox & Snell R <sup>2</sup> .07			Cox & Snell R <sup>2</sup> .03		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

Appendix D

*Logistic Regression Analysis for Parental/Caregiver Death Before and After Age Eighteen on Major Depressive Disorder*

	Miscarriage			Community		
	Wald	Exp(B)	Exp(B)-95%CI	Wald	Exp(B)	Exp(B)-95%CI
Parent/ Caregiver Deceased Before 18	6.4	7.0**	1.5-31.7	.9	2.1	.5-10.1
Parent/ Caregiver Deceased After 19	2.7	2.8	.8-9.5	.4	.5	.1-4.8
	Cox & Snell R <sup>2</sup> .05			Cox & Snell R <sup>2</sup> .04		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses; \*\* $p < 0.01$



## Appendix E

*Interaction of Miscarriage and Parental Death on Major Depressive Disorder*

	Wald	Exp(B)	Exp (B)-95% CI
Parent/ Caregiver Deceased	.4	1.5	.4-5.9
Miscarriage	7.6**	4.6	1.6-13.4
Miscarriage X Parent/Caregiver Deceased	.01	.9	.2-5.2

Cox & Snell R<sup>2</sup> .04

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses; \*\* $p < .01$

## Appendix F

*Interaction of Miscarriage and Parental/Caregiver Death Before and After Age Eighteen on Major Depressive Disorder*

	Wald	Exp(B)	Exp (B)-95% CI
Parent/ Caregiver Deceased Before 18	2.0	2.9	.7-12.7
Parent/Caregiver Deceased After 19	.02	.8	.1-7.5
Miscarriage	3.6	2.5	1.0-6.7
Miscarriage X Parent/ Caregiver Deceased Before 18	.2	1.6	.2-11.9
Miscarriage X Parent/ Caregiver Deceased After 19	.6	2.8	.2-32.8
Cox & Snell R <sup>2</sup> .03			

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$ 10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses

Appendix G

*Logistic Regression Analysis for Age at first Parent/Caregiver Death on Major Depressive Disorder*

	Miscarriage			Community		
	Wald	Exp(B)	Exp(B)-95%CI	Wald	Exp(B)	Exp(B)-95%CI
Age When First Parent/Caregiver Died	.7	.9	.8-1.1	3.9	.7	.5-1.0
	Cox & Snell R <sup>2</sup> .14			Cox & Snell R <sup>2</sup> .18		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses; Analyses only include women with at least one deceased parent/caregiver (not restricted to parental/caregiver death prior to age eighteen)

Appendix H

*Logistic Regression Analysis for Gender of Primary Deceased Parent/Caregiver on Major Depressive Disorder*

	Miscarriage			Community		
	Wald	Exp(B)	Exp(B)-95%CI	Wald	Exp(B)	Exp(B)-95%CI
Gender of Primary Deceased Parent/Caregiver	.9	1.7	.6-5.4	.004	1.0	.3-3.2
	Cox & Snell R <sup>2</sup> .15			Cox & Snell R <sup>2</sup> .10		

*Note:* Age, Level of Education (1- < High School; 2- High School; 3- Some College; 4- College; 5- Post grad), Race (White vs. Other; Black vs. Other; Other Race vs. Other), Marital Status (Not Married vs. Other; Cohabiting vs. Other; Separated vs. Other), Income (1- \$9999; 2- \$10K-\$19999; 3- \$20K-\$39999; 4- \$40K+), and Number of Living Children (0- No Living Children; 1- At least 1 Living Child) were controlled for in all analyses; Analyses only include women with at least one deceased parent/caregiver (not restricted to parental/caregiver death prior to age eighteen)