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**MENTAL HEALTH DISPARITIES AMONG WOMEN IN MIDLIFE: A
LONGITUDINAL STUDY OF DEPRESSIVE SYMPTOMS, STATUS, AND
DISEASE IN THE UNITED STATES**

A Dissertation in

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by

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ABSTRACT

The literature on the effects of depressive symptoms on women's lives is quite extensive. However, much of the focus on depressive symptoms disparities in midlife has been on the role of hormonal changes either at childbirth or during menopause (Freeman et al 2004, 2006; Noble 2005). Many of these studies utilize small, cross-sectional studies to examine women's psychological well being. With over one billion women projected to enter menopause, and subsequently old age, by 2030 (Noble 2005), it is imperative to understand the effects of both social and biological factors on the onset and prevalence of depression among this burgeoning group of women. As the leading cause of disease-related impairments among women worldwide, preventing major episodes of depression will become one of the world's most pertinent health issues.

Drawing primarily upon 6 waves (1993-2003) of the National Longitudinal Surveys Young Women Cohort (NLS-YW), this study expands on previous depression studies by evaluating the impact of socioeconomic status and health-related on explaining differences in depressive symptoms over time. The NLS-YW is a nationally representative sample of women who were initially interviewed during emerging adulthood and were followed until midlife (ages 39 to 51). Specifically, I take a closer look at the depressive symptoms in women over time and how these symptoms vary by key indicators. Furthermore, I examine within-group differences on important demographic, SES, and health-related measures and evaluate which indicators predict membership into a particular trajectory.

Results indicate that four distinct depressive symptoms trajectories emerge over the 11-year span for this group of middle-aged women. Two consistently stable trajectories, stable low and stable high, and two fluctuating trajectories, decreasing and increasing, represent the primary patterns of depressive symptoms in the NLS-YW. A larger percentage of women in the stable high trajectory were black, not married, and had a prior hypertension and heart condition diagnosis. This same group of women, in turn, had the lowest percentage of married women, those with post-secondary education, and those who were employed. By all accounts, the women of the stable low depressive symptoms trajectory are polar opposites of those in the stable high trajectory.

Surprisingly, age was not a significant predictor of trajectory membership in any of the estimated models. In other words, a woman's age did not contribute to whether or not she experienced a less favorable pattern of depressive symptoms over time. Additionally, although within-group differences by race were found in abundance, race was not a significant predictor of group membership once health and SES factors were taken into account.

Socioeconomic status, especially employment, was influential in both within-group variation and in predicting group membership. A large percentage of black women were employed, regardless of their depressive symptoms trajectory. For health-related measures, reports of self-rated health had the biggest impact on predicting trajectory membership. The odds of women in the stable low and decreasing depressive symptoms trajectories indicating favorable health were tremendously higher than the odds of women in the stable high trajectory reporting similar health. Any effect of demographic

characteristics on trajectory membership was eliminated once SES was considered. In sum, a model including both SES and health-related predictors showed the complex nature of depressive symptoms reporting over this 11-year time span.

The results from this study show that research integrating socio-demographic and health characteristics are needed to fully capture why some segments of the female population report a given depressive symptoms trajectory. The inability of any of these factors to differentiate the decreasing and increasing depressive symptoms trajectories suggest the need for additional research that incorporates changes in key predictors over time. This line of research is important from a policy standpoint, as it can provide pertinent information in regards to what aspect of certain women's lives we must focus policy-driven prevention programs.

TABLE OF CONTENTS

LIST OF TABLES	ix
ACKNOWLEDGEMENTS	xi
Chapter 1 INTRODUCTION	1
Chapter 2 DEPRESSIVE SYMPTOMS AND WOMEN IN MIDLIFE: THEORETICAL BACKGROUND	6
What is Depression?	7
Women Across the Life Course: The Importance of Age and Age-Graded Events	9
What is Midlife?	13
The Relationship between Women's Life Domains and Depressive Symptoms in Midlife	25
Placing the Midlife Experience within a Longitudinal Framework	30
Chapter 3 DATA AND METHODS	30
Research Questions and Hypotheses	34
Overview of NLS-Young Women	35
Sampling Design	38
Dependent Variables: CES-D Scores	41
Independent Variables	42
Demographic Variables	44
Socio-Economic Variables	48
Physical Health Conditions	54
Research Methods	71
Chapter 4 ESTABLISHING PATTERNS OF DEPRESSIVE SYMPTOMS AMONG WOMEN IN MIDLIFE	73
Methods	76
Results	81
Summary	84
Chapter 4 Summary Points	84

Chapter 5 PREDICTING TRAJECTORIES OF DEPRESSIVE SYMPTOMS AMONG WOMEN IN MIDLIFE: THE IMPORTANCE OF SES VARIABLES.....	91
Describing the Relationship between SES Measures.....	92
Bivariate Analysis of Within-Trajectory Group Differences.....	94
Multinomial Logit Analysis of Depressive Symptoms Trajectories.....	99
Summary.....	101
Chapter 5 Summary Points.....	102
Chapter 6 THE EFFECTS OF PHYSICAL HEALTH CONDITIONS ON WOMEN'S DEPRESSIVE SYMPTOMS TRAJECTORIES.....	119.
Bivariate Analysis of Within-Trajectory Differences by Race.....	120
Multinomial Logit Analyses of Health Conditions.....	123
Full Model: SES and Health-Related Conditions.....	126
Summary.....	127
Chapter 6 Summary Points.....	129
Chapter 7 Conclusion and Future Directions.....	142
References.....	153

LIST OF FIGURES

Figure 4.1. Elbow Criterion to Determine the Appropriate Number of Clusters.....85

LIST OF TABLES

Table 3.1. Number and Percentages of Women in Each Wave of Analysis, 1993-2003, NLS-YW.....	
Table 3.2. Reason for Noninterview, 1993-2003, NLS-YW.....	
Table 3.3. Overall Characteristics of Non-Attriters vs. Attriters at the First Analysis Wave, 1993, NLS-YW.....	
Table 3.4. The Center for Epidemiologic Studies Depression (CES-D) Scale, Full 20-Item.....	
Table 3.5. Mean, Standard Deviation, and Reliability Coefficients, CES-D Scale, Reduced 7-Item, 1993-2003.....	
Table 3.6. Number of Completed Sets of CES-D Scores, NLS-YW, 1993-2003....	
Table 3.7. Descriptive Statistics for CES-D Women in Final Sample vs. Women with Incomplete CES-D Scores for a Given Wave, 1993-2003.....	
Table 3.8. Demographic Characteristics of Respondents with Complete CES-D Data vs. Respondents without Complete CES-D Data, 1993, NLS-YW.....	
Table 3.9. The Availability of Independent Variables by Survey Year, NLS-YW....	
Table 4.1. Differences in Means and Percentages of Demographic Characteristics by Cluster Membership, NLS-YW, 1993, Unweighted.....	
Table 4.2. Differences in Means and Percentages of Socioeconomic and Financial Well Being by Cluster Membership, NLS-YW, 1993, Unweighted.....	
Table 4.3. Differences in Means and Percentages of Health Indicators by Cluster Membership, NLS-YW, 1993, Unweighted.....	
Table 5.1. Correlations among Independent Variables, Socioeconomic Position, NLS-YW, 1993, Unweighted.....	
Table 5.2. Percentages and Means of Socioeconomic Position Variables by Race and Depressive Symptoms Trajectory, NLS-YW, 1993, Unweighted.....	
Table 5.3. Means and Percentages of Socioeconomic Position Variables by Education and Depressive Symptoms Trajectory, NLS-YW, 1993, Unweighted.....	

Table 5.4. Means and Percentages of Socioeconomic Position Variables by Marital Status and Depressive Symptoms Trajectory, NLS-YW, 1993, Unweighted.....	
Table 5.5. Estimates and Marginal Effects of Multinomial Logit Model of Demographic Characteristics of Depressive Symptoms Trajectory, NLS-YW, Unweighted.....	
Table 5.6. Estimates and Marginal Effects of Multinomial Logit Model of Demographic and Socioeconomic Characteristics of Depressive Symptoms Trajectories, NLS-YW, Unweighted.....	
Table 5.7. Logit Regressions Predicting Membership in HiS and LoS Trajectories for Black and White Women, Disturbance Variance Unconstrained, NLS-YW, 1993.....	
Table 6.1. Percentage of Health Variables by Race and Depressive Symptoms Trajectory, Unweighted.....	
Table 6.2. Multinomial Logit Analysis of Demographic and Health-Related Indicators, NLS-YW, Unweighted.....	
Table 6.3. Multinomial Logit Analysis of Demographic, Health-Related Indicators, and Self-Rated Health, NLS-YW, Unweighted.....	
Table 6.4. Multinomial Logit Analysis of Demographic, Health-Related Indicators, and Self-Rated Health Using Declining Trajectory as the Reference Category, NLS-YW, Unweighted.....	
Table 6.5. Full Model: Multinomial Logit Analysis of Demographic, Socioeconomic, and Health-Related Indicators, NLS-YW, Unweighted.....	

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Chapter 1

Understanding psychological health in middle-aged women requires an in-depth look into the biological, psychological, and social development of women's responses to different stressors across the life course. The adverse aspects of psychological health, such as depressive symptoms, are widely studied in human development research. According to Maughan (2002), depression is "a complex disorder reflecting influences of predisposing individuals' characteristics, early experiences, and more immediately precipitating stressors" (p. 161). Depression, which is often used synonymously with clinical depression, is typically diagnosed by a health professional using a proven psychological assessment criterion (NIMH 2007). Depression is different from depressive symptoms, which are self-reports of possible symptoms (Solomon et al 2001)¹. These symptoms may lie dormant in earlier periods of one's life; however, important stressors at various stages of life may trigger substantial (and negative) shifts in psychological symptoms.

Middle adulthood is an ideal stage in which to examine the heterogeneity of women's reports of depressive symptoms, or pre-clinical symptoms. Several studies show that the reproductive years leading up to and representing middle adulthood are when depression prevalence among women are at their highest (Avis et al 1994; Greene & Cooke 1980; Hunter 1990). These increases in depression prevalence coincide with

¹ Given the lack of biological data in this study, I focus primarily on depressive symptoms. From time-to-time, I discuss past research chronicling depression.

significant sociological and biological changes that typically occur in midlife. For a majority of midlife women, their responsibilities lie heavily within the family, and research examining the dynamics of family-related roles has illustrated the harmful consequences of these roles on women's psychological and physical health (Gove 1984; Moen et al 1995; Waldron et al 1998). Many women spend a large portion of this life stage rearing children, which adds a great deal of responsibility.

In addition to women's multiple roles, significant changes in one's roles are characteristic of middle adulthood and can lead to episodic occurrences of depressive symptoms. For example, middle-aged women who become widowers or divorcees during this life stage exhibit a drastic increase in depressive symptoms immediately following this marital transition (Marks 1996; Marks & Lambert 1998; Turner et al 2004). Similar increases in depressive symptoms occur for women who become caregivers during midlife (Abel 1991; Marks & Lambert 1998; Turner et al 2004), regardless of the relationship between the care provider and recipient (Strawbridge et al 1997). The nature of women's work during this time is linked to increases in depressive symptoms, as those who feel that they have little to no control at work report poorer psychological health (Griffin et al 2002). Occupations lacking autonomy, coupled with low levels of financial achievement, are primary culprits of high levels of depression through midlife and beyond (2002).

From a biological standpoint, the onset of potentially debilitating chronic conditions and the reproductive shift into the menopausal and post-menopausal experience are major factors of the incidence and prevalence of depressive symptoms throughout midlife. Higher levels of adult obesity, alcohol and tobacco consumption, as

well as low levels of physical activity are among several risk factors for persistently high levels of depression in midlife (NIMH 2007). It is no coincidence that these same risk factors are also primary indicators of major conditions such as cardiovascular disease, which is linked to depression in women. Approximately 20-40% of women with heart conditions report depressive symptoms (Rutledge & Hogan 2002). Likewise, middle-aged women who experienced increases in systolic blood pressure over time, regardless of hypertensive state, were also likely to exhibit increases in depressive symptoms over the same length of time (Raikkonen et al 2001). Intuitively, the first onset of declines in health can lead to a wide range of emotions, especially among women who view even the slightest decline as a sign of impending health complications associated with older age.

Despite the numerous studies chronicling the relationship between depression and various aspects of women's health, we still know very little about the manner in which social and other health-related factors collectively contribute to differences in reports of depressive symptoms. Two lines of research are typically used to understand the impact of various causes on disease and other health outcomes. On the one hand, a segment of this research focuses on social conditions as the fundamental cause of diseases. This theory contends that factors such as SES and social support play a crucial role in affecting multiple health outcomes through various mechanisms (Link and Phelan 1995; 1996; 2000). On the other hand, other health-based literature tends to focus on the impact of comorbidity on health outcomes (Markman 2007; Schellevis et al 1993; van de Akker et al 1998). Both status and health-related measures significantly affect depressive symptoms, but we have yet to fully grasp to what extent these characteristics influence the likelihood of reporting depressive symptoms in midlife.

Assessing how women rate their psychological well being over time is essential for establishing distinct patterns of depressive symptoms through middle adulthood. Depressive symptoms can fluctuate, recur, and persist during midlife, which makes it virtually impossible to evaluate differences in symptoms via cross-sectional methods. Longitudinal methods are more becoming more commonplace, although many of the recent studies involving women's depressive symptoms in midlife use only two or three waves of survey data to establish patterns for what is a considerable span of human development (Avis et al 1994; Freeman et al 1994; Woods, Mariella, & Mitchell 2002).

Drawing primarily upon 6 waves (1993-2003) of the National Longitudinal Surveys Young Women Cohort (NLS-YW), this study expands on previous depression-related studies by evaluating the impact of socioeconomic status and health-related variables on explaining differences in depressive symptoms over time. The NLS-YW is a nationally representative sample of women who were initially interviewed during emerging adulthood and were followed until midlife (ages 39 to 51). I examine four primary research questions in this study:

- 1) What are the major depressive symptoms trajectories for midlife women?
- 2) Does trajectory membership vary by race?
- 3) How does trajectory membership vary by SES and health status at baseline?

This research seeks to add to the existing literature on depression and health by providing a broad overview of significant factors attributing to the differences in depressive symptoms over time. Many of the prior depression-related studies are based on cross-sectional designs (Bromberger et al 2004; Kessler et al 1994) with small, non-representative samples (McDaniel et al 1995; Woods & Mitchell 1997). Additionally,

these smaller clinical samples do not include extensive sociological measures such as occupational prestige or job satisfaction. Although the NLS-YW lacks true biological data, this dataset is one of the few U.S.-based datasets equipped to specifically study the complexities of women's midlife. Surprisingly, with the exception of studies generated from the MIDUS, very few sociological studies have attempted to place the midlife experience within the life span development perspective. Typically, most demographic studies focus on the relationship between depressive symptoms and specific life events, transitions, or stages of development (e.g. childhood, aging) (Aneshensel 1986; Hann, Winter, & Jacobsen 1999; Link, Lennon, & Dohrenwend 1993; Onyike et al 2003;). To my knowledge, no U.S.-based study has incorporated six or more waves of data in order to examine differences in depressive symptoms trajectories.

This dissertation is divided into seven chapters. The next chapter provides a more detailed discussion of the emerging research on midlife and how this life stage is important in understanding women's depressive symptoms. I also discuss the social and biological occurrences that make women's midlife a unique experience. Chapter 3 offers a detailed description of the data, measures, and analytical framework of the study, with a comprehensive discussion of the hypotheses included. In chapters 4 through 6, I establish the depressive symptoms trajectories, discuss within-group differences, and evaluate the primary SES and health-related predictors for the trajectories. I conclude the study with a discussion of the overall results and provide directions for future research.

Chapter 2

Depressive Symptoms and Women in Midlife: Theoretical Background

Understanding changes in health has become a major research focus for a range of disciplines. Research highlighting the importance of chronic disease management (Ben-Shlomo & Kuh 2002; Kuh & Ben-Shlomo 1997), disability (Clark & Maddox 1992; Murray & Lopez 1996; Verbrugge 1995), and demographic characteristics (Gold et al 2000; Hayward & Heron 1999; Lynch 2003), among others, is instrumental in battling key health issues. At the forefront of multidisciplinary health research is the impact of disparities, such as race, on health outcomes (Bromberger et al 2004; Williams & Collins 1995; Williams, Lavizzo-Mourey & Warren 1994). The scientific community has increasingly emphasized the need to integrate research across disciplines to address the potential social, biological, and psychological consequences of health disparities (Ben-Shlomo & Kuh 2002).

Additionally, an important aspect of health research that is gaining more attention is disparities in mental health outcomes. Differences in the onset and prevalence of depression, a particular dimension of mental health, are widely documented as a major disease burden (NIMH 2007). Depression is a highly undiagnosed condition that, when left untreated, can greatly affect a person's ability to function on a daily basis and to develop and maintain social relationships (NIMH 2007). These concerns are often more pronounced among women, who have higher lifetime rates of depression than men (Bebbington 1998; Cyranowski et al 2000; Kessler 2003; Maciejewski, Prigerson &

Mazure 2001; Weissman & Klerman 1977). Biological literature points to hormonal changes at various stages of the life span (e.g. puberty, childbirth) as primary culprits of sex differences in depression. In turn, social science research has uncovered links between depression and social factors such as women's increasing work and caregiver responsibilities (Aneshensel, Frerichs & Clark 1981; Walen & Lachman 2000).

The following study attempts to add to the current literature on women's depression by examining the impact of a host of demographic, status, and disease variables on the likelihood of women reporting a particular pattern of depressive symptoms. The remainder of this chapter expounds on the importance of examining depressive symptoms among women during a crucial stage of the life span—middle adulthood.

What is Depression?

Depression is a debilitating health condition and is considered the fourth major contributor of the global burden of disease by the World Health Organization (WHO 2008). WHO defines depression as “a common mental disorder that presents with depressed mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration” (2008). Global burden is based on calculations of disability adjusted life years, or DALYs, which represents the sum of the total number of potential years of life lost due to premature mortality and the years of productive life lost due to a diagnosed disability (2008). An estimated 121 million people worldwide suffer from depression and depression-related symptoms (WHO 2008).

There are several different types of depressive disorders; however, most of the epidemiological-based literature focuses on two outcomes—major depressive disorder, or major clinical depression, and depressive symptoms, which are based on self reports (Belle & Doucet 2003; Judd et al 1998; Kessler 2003; Maughan 2002; Sherbourne et al 1994). Clinical depression is typically diagnosed by a health professional using the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), a criteria that is often used to diagnose various mental health disorders, and WHO's International Statistical Classification of Diseases and Related Health Problems (current version ICD-10) (NIMH 2007). In general, depression is defined via a host of symptoms that potentially affect a person's ability to sleep, eat, work, and function in their regular activities.

Similarly, depressive symptoms, as typically defined in population-based research, are essentially the symptoms one may experience that have not necessarily been formally diagnosed. These symptoms can include prolonged sadness, restlessness, feelings of guilt and hopelessness, and insomnia, among others (NIMH 2007; Radloff 1977). These symptoms are revealed in survey-based questionnaires and are often used as the first step in the process of diagnosis (Solomon et al 2001).

Past research has estimated that approximately 22% of middle-aged women exhibit clinically depressive symptoms (Kessler et al 1994; Noble 2005), with lifetime prevalence of depression ranging from 6 to 17% (Blazer et al 1994; Kessler 2003). Women are more likely to report and to be diagnosed with depression than their male counterparts. Sex differences in depression emerge as early as the pre-teen years (Kessler 2003). Although the likelihood of depression onset decreases with age among women (Bromberger et al 2004b; Weissman et al 1992), major depression still remains the

leading cause of disease-related disability among women globally (Kessler 2003; Murray & Lopez 1996).

While much attention is given to sex differences in depressive symptoms, in-depth analyses of the nature of women's depression-related trajectories are undoubtedly necessary. Are different patterns of depressive symptoms among midlife women influenced by differences in race, age, marital status, and/or socioeconomic status? Are there distinct patterns of depressive symptoms trajectories characteristic of middle adulthood? Even though numerous studies have evaluated the prevalence of depression among adult women, very few demographic studies examine the potential complexities of within- and between-group depressive symptoms trajectories using human development and sociological perspectives.

Women across the Life Course: The Importance of Age and Age-Graded Events

Studying depressive symptoms among midlife women is not complete without addressing the concept of aging within a life course framework. At the basic level, chronological age, which is occasionally used as a proxy for biological maturation, may represent membership in a larger social structure, cohort, or life stage (Settersten & Mayer 1997). When people share or are affected by an event or experience, the collective change serves as a catalyst for social change (Riley 1986). This collective change produces age structuring within the life course, where both formal (e.g. social institutions) and informal (individual-level behavior) norms regarding how individuals within a cohort operate become commonplace (Kertzer 1989; Settersten & Mayer 1997). So how do age structuring and the overall aging process impact women's reporting of

depressive symptoms in midlife? An in-depth assessment of midlife development is needed to explain the potential complexities of women during this time period.

What is Midlife?

To understand depressive symptoms in middle-aged women, one must first have a clear definition of this developmental stage. Unfortunately, defining midlife can be quite difficult, for there is no single definition for this stage of life. However, researchers have attempted to define midlife, often based on a particular age range. For instance, midlife is roughly defined as the years between ages 40 and 60 (Lachman 2004; Wahl & Kruse 2005), although some studies extend the tail end of the age boundary to 65 (200), thus making the typical retirement age the point where midlife ends and old age begins. In the case of women, past biological research has used the onset of menopause to denote the end of midlife (Wahl & Kruse 2005).

The increase in popularity of life course and life span-based studies has led to more contemporary definitions of midlife. Instead of primarily using age to define middle adulthood, current research characterizes the middle stage of life as a time of pronounced heterogeneity, both between and within individuals. Middle adulthood is now representative of increasing diversity in roles and opportunities (Moen & Wethington 1999; Perrig-Chiello & Perren 2005). This new way of conceptualizing midlife reflects sociological literature on the deinstitutionalization of the life course, in that people in the same age cohort can vary on the stages of their careers, familial relationships, and other role expectations (Held 1986; Moen & Wethington 1999; Perrig-

Chiello & Perren 2005). The increase in the age at which women have their first child, for example, can alter one's perception of midlife. Based on some of the age ranges defining midlife, earlier generations were more likely to be grandparents than the middle-aged women of the last half of the 20th century. Similarly, if midlife is characterized by the absence of major health problems, an earlier than expected onset of a disease can lead to ambiguity in characterizing this life stage. In essence, defining midlife is subjective, as its meaning can vary by a host of different environmental, socio-cultural, and demographic factors. Typically, midlife tends to precede retirement and follow young adulthood.

Aside from its ambiguous definition, midlife development plays an important role in preparing individuals for the possible health, financial, and social changes of old age. In midlife, many people are at the height of their careers, and personal relationships, both familial and non-familial, are strengthened during this time period (Lachman 2004). Until very recently, a long-held belief of developmental psychology was that human development ceased after young adulthood (Wahl & Kruse 2005). Advances in life course sociology and life span psychology have shown that development is a continuous process, as individuals often experience improved emotional regulation (Magai & Halpern 2001), increased wisdom and intelligence (Baltes 1999), and a greater sense of control over their lives (Lachman 2004; Lachman & Bertrand 2001). Additionally, midlife is often a time of reflection and choices (Baltes & Baltes 1990). For example, the emergence of health problems and the possible death of parents are two of many characteristics of midlife that prepare women for the next stage in life.

A recent meta-analysis by Lachman (2004) attributed the increased attention towards middle adulthood within the social sciences to several key demographic trends. The unusually large size of the Baby Boom cohort, typically defined as people born between the years of 1946 and 1964 (Lachman 2004), mirrors the increase in midlife-based studies, as researchers are able to benefit from the unusually large number of people transitioning into this heterogeneous stage of life. Similarly, increases in the average life expectancy in industrialized countries not only led to a longer length of time in which researchers could study the life span but also resulted in a complete overhaul of the social, demographic, and health markers that were once indicative of midlife. In the past, people often experienced the death of a parent at earlier ages. Today, however, it is not uncommon for a middle-aged woman to have at least one parent alive. The advances in disease prevention, coupled with increases in both the average and active life expectancy, have resulted in a healthier middle-aged population.

Although positive aspects of life are evident in middle adulthood, cultural- and media-driven stereotypes have, in some cases, prevailed. Many individuals think of the middle adulthood as the time in which one undergoes his or her “midlife crisis” (Wethington et al 2004). Originally driven by fear of death (Jaques 1965), a midlife crisis is, in theory, quite similar to turning points within an individual’s life course (Lachman 2004; Wethington et al 2004). According to Wethington and colleagues (2004), turning points have a tendency to cluster together at various times throughout the life course. Because most turning points are career-related, the “midlife crises” that are often portrayed in the media as unique experiences for males occur at an earlier time for women (Moen & Wethington 1999). The highs and lows indicative of the complexities

of midlife have the ability to significantly influence the psychological well being of both men and women at this crucial life stage.

The Relationship between Women's Life Domains and Depressive Symptoms in Midlife

The multidimensional nature of midlife presents many challenges when attempting to pinpoint the primary social, demographic, or health factors that lead to divergent, and often adverse, pathways of psychological well being among women. While much of the literature on women's mental health in midlife focuses on specific issues, differences in the onset and prevalence of depressive symptoms can be influenced by a number of factors that are unique to middle adulthood. Deciphering the interplay between biological, psychological, and social aspects of the middle years can provide a better platform for which we can study the aging process.

Understanding depressive symptoms among middle-aged women requires an extensive look into the association between social relationships and midlife development. Social relationships are important during any life stage; however, the constant restructuring of role responsibilities in midlife is especially daunting. Middle-aged women are typically managing relationships with family members and co-workers. The degree in which women are engaged in interwoven roles is highly dependent upon their social class, marital status, and the age of their children (Ryff & Seltzer 1996). Women who gave birth to their children at early ages are more likely to become grandmothers during the latter half of midlife, thus adding another important relationship to their network system. An analysis of black women in Los Angeles revealed that early births

led to reassessments of roles and expectations that some mothers, and grandmothers, were not emotionally and financially prepared to handle. The birth “forced” them into roles that, in a sense, prematurely aged the women (Burton 1985).

Although many sociological studies address the effects of marriage on health, very few studies focus on this relationship within a midlife sample. In general, married women in midlife are less likely to report depressive symptoms than are non-married women (Earle et al 1998). Transitions from one marital status to another in middle adulthood adversely affect the prevalence of depressive symptoms and overall psychological well being of women. Separating or divorcing during midlife is more traumatic for women than for men (Marks & Lambert 1998). In turn, a study using the 1992 and 2000 waves of the Health and Retirement Study showed that women who marry in midlife typically experience fewer depressive symptoms than their non-married counterparts, whereas those who became widowers during the same time reported increases in depressive symptoms compared to those who are not widowed (Turner et al 2004).

The multitude of women’s social relationships differentiates their midlife experiences from those of men. At any given time, women are actively involved in others’ lives through their roles as a parent, an adult child, and a spouse, often to a larger degree than males (Lachman 2004). The degree of psychological distress generated from these roles is often dependent upon the health of one’s parent(s) and the age of one’s children. Women whose children are no longer in the home report improvements in their mood state and an overall reduction of daily hassles (Dennerstein et al 2002).

Social support can be both a benefit and a hindrance to the psychological well being of midlife women. Close ties with friends and family members have generally led to a decrease in the likelihood of reporting depression and other psychological measures (Antonucci et al 2001). Ironically, the same support system can also create social strain through negative interactions and dissolved relationships (Rook 2003; Walen & Lachman 2000). The effects of strained social relationships on health problems are particularly salient within the most intimate relationships. A recent study on social strain contends that heated exchanges between respondents and their intimate partners were highly predictive of declines in health status (Walen & Lachman 2000).

Gains in socioeconomic status in midlife in many ways reflect the accumulation (or lack thereof) of resources over time. Women's career trajectories, for example, are shaped by the extent to which educational, financial, and social opportunities were available to women in midlife. The heterogeneity of women's employment status and career paths are particularly important in explaining psychological health in midlife. Aside from people's roles as parents, siblings, or spouses, individuals are socially defined by their paid occupational careers. A fragmented work history, the lack of employment, and the absence of a meaningful career in midlife may lead to feelings of self-doubt and persistent struggles with depressive symptoms.

By most accounts, employed women are likely to report better health than non-employed women. Most studies attribute this finding to what is known as the "healthy worker effect" (Repetti et al 1989), which asserts that healthier women are more likely to secure and maintain a job. However, there are mixed results regarding the mental health-employment association among women, with some studies finding that employed women

were less depressed (Aneshensel 1986; Gore & Mangione 1983) while others found no impact of employment on depression (Aneshensel et al 1981; Cleary & Mechanic 1983; Parry 1986; Repetti & Crosby 1984).

The transitions in and out of the labor force are equally important to psychological well being. Women entering the labor force during midlife may find it quite difficult to secure employment because of extended spells of inactivity (Pavalko & Artis 1997). This variability in job entries intuitively leads to even more variability in the transitioning into retirement, which often starts in midlife. Because of family responsibilities, women have a greater tendency to enter and exit the labor force, which often translates into shorter work histories when compared to their male counterparts (Pavalko & Artis 1997). This disparity can negatively affect women's lifetime earnings as well as influence their outlook on retirement.

The SES gradient in health, which describes the consistent linear relationship between low SES groups and higher rates of health problems and mortality (Adler et al 1994; Adler & Ostrove 1999; Smith 2005), is clearly a factor in explaining the differences in midlife depressive symptoms. A recent meta-analysis of over 50 international studies found that low SES men and women have a slightly higher risk of onset of depression in adulthood and a moderately higher risk for depression prevalence (Lorant et al 2003). The magnitude of the relationship varied based on the definitions applied to both depression and socioeconomic status. Aside from the more traditional measures of SES, additional career and social status measures such as the lack of health care, job dissatisfaction, and hazardous work conditions, collectively strengthen the association between low SES and depression (Carr 2003).

For adult women, poverty is by far one of the most persistent predictors of depression (Belle & Doucet 2003). Additionally, poor women, who are also less likely to be married, encounter more persistent and adverse life events than do their peers (Brown et al 1975; Dohrenwend 1973; Makosky 1982). The presence of dependent children can also add to the financial and social despair. Poverty can also undermine the effectiveness of important social relationships. Women's advantage over men in having a larger social support system can be attenuated by poverty. While the presence of a social network of family and friends helps to reduce the likelihood of depression among some low-income women (Belle 1982; Galaif et al 1999), studies have shown that the support from close companions can in fact lead to more stress (Edin & Lein 1997). "Stress contagion" is likely to occur within low-income women's inner circles, as the people to whom they are close are likely to be in similar financially and socially stressful circumstances (Wilkins 1974). Thus, the exchanges between low-income women and their social support system can be just as time-consuming and stressful as those with little to no social support. Past research has found that higher income women are better able to remove themselves from harmful social relationships (Belle 1982).

Population-based literature examining race/ethnic differences in depressive symptoms among middle-aged women is quite rare. The exceptions are those studies using data from the Study of Women's health Across the Nation (SWAN), a U.S. longitudinal-based, multisite study that reports the experiences of blacks, whites, Chinese, Hispanic, and Japanese women who are approaching or experiencing menopause (Bromberger et al 2004). In general, black women are more likely to report depressive symptoms than are whites in midlife (Bromberger et al 2004; Myers et al

2002), with Hispanics' pattern of depressive symptoms typically mirroring those of blacks. Asian women reported, on average, lower odds of depressive symptoms than any other ethnic group. The differences in the association between race/ethnicity and depressive symptoms are eliminated once socioeconomic status is considered. This finding echoes results from midlife studies showing that women with lower SES, low social support systems, and poor physical health are more likely to report depressive symptoms (Bosworth et al 2001; Kaufert et al 1992; McKinlay et al 1987).

Cultural differences in the psychosocial risk factors related to depressive symptoms may provide better insight into the higher reports of depressive symptoms among minorities. Racial discrimination, language barriers, and the pressure to assimilate into one's environment are all related to the consistently higher levels of depression among black and Hispanic women (Ballenger et al 2001; Clark et al 1999; Myers et al 2002). Adverse life events spanning as far back as childhood place minorities at a disadvantage psychologically; the lack of financial resources coupled with fragmented social support systems, are potential explanations of minority women's reports of poor psychological well being.

Middle adulthood typically represents a time when women possess, in general, good physical health. The emergence of possible signs of disease onset may occur in women who are approaching the later stages of midlife. For most, these changes are still not enough to warrant substantial concerns. However, any noticeable changes may cause fear and anxiety in women, especially if they view themselves as being too young to have a particular ailment. For many of those who do experience early onset of declining health, the role of one's lifestyle and health behaviors becomes even more important.

Midlife habits significantly affect the aging process, as conditions such as heart disease, diabetes, and hypertension all have modifiable risk factors (Lachman 2004; Merrill & Verbrugge 1999). The importance of lifestyle factors in the physiological changes that are beginning to occur does not go unnoticed among most midlife women. Although declines in exercise are reported with increasing age, women at this stage of life are more likely to take significant steps to improve their health than are men of the same age (Cleary et al 2004; Lachman 2004).

The historical use of white men as the gold standard for researching chronic health conditions during middle adulthood and beyond has led to our lack of knowledge regarding the impact of physical and mental diseases on women's lives. For example, this ambiguity has translated into a 10-15 year lag in heart disease diagnosis among women, which has led to a higher probability of recurrent heart attacks and premature mortality in adulthood (Eaker et al 1987). Compared to their male counterparts, women diagnosed with coronary heart disease find it harder to return to their jobs and other normal day-to-day activities (Brezinka & Kittel 1996). Age and severity of conditions did not explain this disparity; however, researchers suggest that the lack of economic incentives to return to the workforce, lower occupational prestige jobs, and marital status (e.g. married women having another source of money to rely on) are all potential factors that may explain these findings (Chirikos & Nickel 1984; Brezinka & Kittel 1996). Thus, research evaluating the trajectories associated with cardiovascular disease and other potentially fatal conditions in midlife women are still underdeveloped.

Obesity, physical inactivity, smoking, alcohol consumption, and genetic predisposition, among others, are common risk factors contributing to divergent health

trajectories in middle adulthood and later life. Current research, however, is turning to depression and other measures of psychological well being to gain a better understanding of the mental and physical changes occurring simultaneously in midlife. An excellent example of this research is the increase in studies linking depressive symptoms to heart disease. An estimated 20-40% of women diagnosed with heart problems also exhibit depressive symptoms (Rutledge et al 2006). Previous studies have also shown that middle-aged women with pre-existing heart conditions were three times more likely to have depressive symptoms than the rest of the midlife U.S. population. After controlling for standard demographic, behavioral and physiological risk factors, the presence of plaque equated to a two-fold risk of depression among the sample of middle-aged women (Jones et al 2003).

Moreover, substantial increases in studying the link between depressive symptoms and women's physical health outcomes in midlife underscore the importance of examining both the severity and direction of the mental health-physical health association. While some studies report a significant relationship between current depressive symptoms and diagnosed condition, other studies contend that depression's role in the onset of physical health conditions is the result of a lifetime of recurring depressive symptoms (Jonas et al 1997; Rutledge et al 2006). For example, research examining the effect of mental health trajectories on incident hypertension in midlife women revealed no association between depression and hypertension at baseline. However, after 9 years, increases in depressive symptoms were highly related to increases in systolic blood pressure in both hypertensive and non-hypertensive women (Raikkonen et al 2001).

With any physical ailment comes the potential for functional decline. Functional limitations have been linked to the onset and prevalence of hypertension, diabetes, arthritis, osteoporosis, and several other major health conditions (Pope et al 2001). However, the factors driving the relationship between functional limitations and disability and psychological well-being in midlife are poorly understood. Most studies find a significant association between depressive symptoms and poor functioning (Coryell et al 1993; Dew 1998; Wells et al 1989), yet the variability in defining poor functional health makes it difficult to ascertain the true nature of poor functional health among midlife women. For example, while some studies use common scales such as the Activities of Daily Living (ADL), other studies define limitations based on inability to engage in moderate and vigorous activities (Weyerer 1992; Wray & Blaum 2001). The differences between definitions can have a huge effect on the association between depressive symptoms and functional decline (Strawbridge et al 2002), as some women may not engage in these activities due to personal reasons and not because of any physical limitation.

Several studies focusing on midlife women have found links between depressive symptoms and complaints of body pain. Specifically, prior bouts of depressive symptoms are associated with elevated levels of body pain and current medical treatment for back pain (Bromberger et al 2005; Holzberg et al 1996). This relationship has proven to be long-lasting, as another longitudinal study of midlife women found that the presence of major depression at the baseline interview was a predictor of severe back pain thirteen years later (Larson et al 2004). Additionally, women in the same sample with

recurring depressive symptoms were four times more likely to have been treated for back pain over a decade later even after being treated for their depressive symptoms.

Aside from the effects of chronic health conditions, explanations for this strong relationship between back pain and depressive symptoms among women are speculative. Since most researchers interested in functional limitations and disability do not focus on populations under age 65, our understanding of the onset of chronic body pain and its effects on well-being in midlife are limited. The lifetime prevalence of any type of body pain ranges from 24% to 37% in the general American population (Bair et al 2003; Regier et al 1984), thus suggesting that the poor functioning reported among older adults in aging studies likely started in midlife.

Unlike men of the same age, middle-aged women have a clear demarcation between the end of midlife and old age in the reproductive changes associated with menopause. A simple definition of menopause is the permanent cessation of menstruation (Kuh & Hardy 2002). Women first begin to experience signs of menopause in the pre-menopause stage, where reproductive hormones begin to fluctuate. Women then move into an early transition phase of perimenopause, as the length of menstrual cycle changes for at least two consecutive cycles. The late transition, or post-menopause, is characterized by at least 3 to 11 months of amenorrhea, or the cessation of menstrual bleeding (Freeman et al 2004).

Entering menopause at an earlier stage in life increases the risk of depression in women with no prior history of major depression (Cohen et al 2006). While the probability of depression increases during menopause, some reports show that the likelihood of being depressed decreases after menopause, when taking into account a host

of social and biological factors (Freeman et al 2004). Moreover, women in their late 40's and early 50's who have undergone a hysterectomy or are taking hormone replacement therapy medication report higher levels of depression and anxiety than do their female counterparts in all stages of the natural menopause experience (Kuh et al 1997).

Past public perception of menopause was that it served as the gateway to aging and denoted the beginning of significant deterioration in health (Aneshensel 1986; Lachman 2004). Additionally, negative views of this time period were once driven by the urgency of some women to complete the normal life transition of reproducing before entering menopause, an important, and perhaps final, "developmental deadline" in the female life span (Heckhausen 2001; Lachman 2004; Neugarten 1968). Today, increases in women's average life expectancy, substantial improvements in the well being of older women, and the rising number of women who decide not to have children have created a much more positive, and heterogeneous, outlook on both menopause and later life. In fact, previous research on the attitudes of middle-aged women showed that most American women have discarded old views of menopause being a marker for impending ill health (Bowles 1986; Kay et al 1982; Lachman 2004; Leiblum & Swartzman 1986).

The possibility of a connection between depressive symptoms and menopause is vast, given the length of time women experience both the menopause transition and the actual event. Although the median age of menopause is between 50 and 52, the entire experience itself, including the transition phase, can last anywhere from 3 to 10 years (Avis 1999; Rossi 2004). The substantial variability in the length of menopause undoubtedly leads to heterogeneity in women's management of psychological and physical symptoms related to menopause.

Many physiological and social reasons are given as to why the depression prevalence is at its highest during middle adulthood. From a biological standpoint, the constant fluctuation of hormones that occur during pregnancy and the reproductive years as well as the drastic changes in estradiol levels during menopause are often cited as key components of elevated depression prevalence in midlife. The effects of hormonal-related changes, such as hot flashes and night sweats, have been directly linked to increases in reports of depression (Lachman 2004). However, social scientists often argue for more socially driven explanations of the depression-menopause link. Possibly the strongest argument for the effects of life events and social stressor on depression is found in studies on estrogen replacement. When women are given estrogen-based oral contraceptives, depressive symptoms typically do not decline (Bancroft & Rennie 1993), thus supporting the need for more integrative studies on the social and biological effects of menopause on psychological well being.

Several studies have suggested that social conditions are more important in explaining midlife depressive symptoms than the hormonal changes associated with menopause (Greene & Cooke 1980; McKinlay et al 1987). For example, Kuh and colleagues found that, among a British cohort of 47-year old women, a strong relationship existed between depressive symptoms and family and career-related stress. Surprisingly, menopause had little to no effect on depressive symptoms (1997). Similarly, Woods and others identified three main pathways to depressed mood among a Seattle-based sample of women—stressful life, health status, and menopause. The researchers ultimately found that the menopause pathway did not explain depression in

midlife, whereas the pathway characterizing stressful life events accounted for most of the depression reported in the sample (Woods et al 2002).

As detailed in the prior section, several factors contribute to the likelihood of women reporting depressive symptoms throughout midlife. What most of the preceding literature does not address is the degree in which both health and status measures affect reports of depressive symptoms. Some researchers, however, do argue for placing greater importance on social support and SES's role in depressive symptoms (Belle 1982; Belle & Doucet 2003). This argument is in line with research emphasizing the significance of social conditions as the fundamental causes of disease (Link & Phelan 1995; 1996; 2000). According to this theory, factors such as SES are important in that they have a far-reaching effect on not only depressive symptoms, but a host of other conditions as well (Link & Phelan 1995). In turn, Link and Phelan have argued that many in the epidemiological arena are increasingly focusing their research on more proximate measures of diseases (1995), such as the impact of chronic health conditions on depressive symptoms. Both proximate and distal causes of diseases appear to play an instrumental role in depressive symptoms reporting; yet, the manner in which both sets of causes interact to affect differences in depressive symptoms among midlife women remains unclear.

Placing the Midlife Experience within a Longitudinal Framework

The preceding section described in detail the issues midlife women collectively endure. However, a review of sociological literature characterizing midlife women

would reveal a complex story. For example, while some women are experiencing empty-nest syndrome (e.g. children leaving home), others still may have children in their household or are taking care of parents (Leiblum 1990; Lippert 1997). Also, many women find themselves re-orienting their lives, as this change in household structure can lead to changes in marital relationships (Dennerstein, Dudley, & Gunthrie 2002; Leiblum 1990).

These changes in the social structure women experience in midlife undoubtedly affect the likelihood of reporting depressive symptoms. However, the impact of these social changes remains unclear. The changing social structure may not affect women in the same manner. For instance, the departure of children in a household may be viewed as a welcome change to some. In turn, this same occurrence may lead to feelings of despair for another person. Discussing these changes within a longitudinal framework is important to understanding differences in patterns of depressive symptoms in midlife.

The heterogeneity among women on various dimensions of midlife are rooted in the broader framework of examining change and growth across the life span. Studies in life course sociology and life-span developmental psychology have been widely used measure trajectories of change, although only recently have researchers attempted to integrate these two frameworks to address the intricacies of human development (Diewald 2001; Mayer 2003; Settersten Jr 2005). The largest distinctions between life course sociology and life span psychology are the unit of analysis studied and the perceived differences in the causal forces driving variability in human development over time. Sociology seeks to explain the "social by the social," or the creation, progression, and end results of "social facts" or phenomena (Durkheim 1964—original in 1895;

(Settersten Jr 2005)). Subsequently, the life course has a long history of operating on what Karl Mayer (2003) describes as a “black box of the actor.” Essentially, life course sociology tends to focus on average group-level behavior that does little in the way of connecting decision-making processes across the life course (Mayer 2003). This specialization is apparent in the constructs of interest in life course studies.

Typically, life course research is interested in external factors that shape and alter individuals’ and groups’ trajectories within particular social institutions. For example, many life course sociologists are interested in examining the impact of the timing, duration, and/or frequency of social factors such as education and marriage on various aspects of life chances. Individuals are often characterized based on experiences (e.g. work, school) and the variability in their trajectories is often described within the context of demographic factors such as birth year, SES, race, or gender (Diewald 2001; Mayer 2003; Settersten Jr 2005).

In contrast, traditional life span research rarely concentrates on the effect of structural constraints beyond the individual, though some studies have focused on family-level differences (Kohli & Kunemund 2005). The foundation of life span psychology rests upon the notion that human development does not end in childhood or at a particular stage, but is a life-long process (Baltes 1999). Historically, life span research has focused on the formation and persistence of interindividual similarities and differences in behavioral outcomes. Unlike life course’s emphasis on diverging trajectories within evolving social constraints, life span psychological research often discusses variability over time within changing, genetically defined constraints (Baltes 1987; Diewald 2001).

Recent efforts to unite life span and life course studies have highlighted our need to understand the pivotal social, psychological, and biological changes occurring in midlife (Alwin & Wray 2005). Middle adulthood did not become a relevant life stage until longitudinal-based studies highlighted the increasing interplay of multiple roles and the continued personal growth of women in adulthood. Life course research has enhanced our knowledge of women's developmental pathways within the context of age-related norms and institutions. For instance, differences in disease prevalence among midlife women are often explained via life course-based paradigms such as the cumulative disadvantage perspective, which emphasize how inequalities arise and accumulate over time (O'Rand 1996; Willson 2007). Interest on disparities in midlife have been fueled by advances in research linking early life circumstances to adult health outcomes (Hayward & Gorman 2004; Kuh 1997; Kuh & Hardy 2002; Lawlor et al 2005; Wray et al 2006). Early exposure to adverse events in childhood, such as stressful family lives, childhood sexual abuse, and parent's marital discord, are all detrimental precursors to women's poor psychological health in adulthood (Bebbington 1998; Maughan 2002; Roesler & McKenzie 1994).

From a life course perspective, these early adversities set in motion a continual path of multiple hardships that lead to poor psychological well being. Early life experiences can foster feelings of entrapment and uselessness, which may translate to recurring depressive symptoms in middle adulthood (Maughan 2002). Whereas a life course framework provides a glimpse of how women's experiences within the scope of institutionalized norms and age-related transitions vary over time, the life span perspective is historically interested in understanding women's own individual growth

and change over the life span. For example, life span researchers have begun to address psychological well being and its relationship to changes in cognition (Martin & Zimprich 2005), personality (Lachman & Bertrand 2001; Pulkkinen et al 2005), and emotional regulation (Magai & Halpern 2001).

In summary, this study evaluates the impact of multiple measures, both status and health characteristics, on the likelihood of women reporting a given depressive symptoms trajectory over an 11-year period. Rather than using a latent growth curve approach that estimates the average effects of covariates on between-person differences in reports of depressive symptoms over multiple time points, I initially examine patterns of overtime change in reported symptoms to develop a subset of trajectories with an emphasis on patterns of within-person variability. Then, I evaluate the extent to which that within-person variability can be classified into identifiable and meaningful groups. Aging represents the concept of time in this study. I examine the multidimensional ways in which both status and health/illness characteristics predict differences in depressive symptoms trajectories, while paying close attention to the impact of age and race on these differences.

Chapter 3

Data and Methods

As discussed in the introduction, the overall objective of this study is to decipher and explain longitudinal patterns of depressive symptoms among a sample of midlife women. This study seeks to establish the major patterns of depressive symptoms that span an 11-year period among midlife women. In doing so, this study takes a closer look at the impact of socio-demographic, SES and other health-related measures on women's likelihood of reporting a distinct pattern of depressive symptoms over time.

This chapter offers background information on the data and final sample and establishes the analytical framework detailed in the subsequent chapters. First, I discuss the research questions and the accompanying hypotheses that drive this study. Next, I provide an overview of the NLS-YW cohort, detailing the research design, attrition, and basic characteristics of the sample. Finally, I present a detailed description of the dependent variable, CES-D scores over time, and the key independent variables used within each set of analyses.

Research Questions and Hypotheses

Rather than addressing differences in depressive symptoms among midlife women cross-sectionally, this study utilizes six waves of data to establish and predict the characteristics that initially set women on different mental health-related pathways. This study also acknowledges the significance of changes in demographic, economic, and

health statuses in maintaining these differences. I examine three main research questions in this study:

- 1) What are the major depressive symptoms trajectories for midlife women?
- 2) How does trajectory membership vary by SES and health status at baseline?
- 3) Do changes in demographic, SES, and health status over time affect depressive symptoms trajectory membership?

Previous literature on psychological well being and midlife development among women provides the foundation for studying possible trajectories of depressive symptoms in this population-based sample. Based on this prior knowledge, I offer several hypotheses that may potentially account for disparities in depression-related trajectories of women in midlife.

Hypothesis 1: Since midlife represents a time of constant change and variability in different life domains (Almeida and Horn 2004; Lachman and James 1997), that variability is reflected in distinct patterns of depressive symptoms reporting. The "peaks and valleys" or fluctuations (Lachman 2004) that characterize the physical, psychological, and social aspects of adults in midlife to several patterns of reporting depressive symptoms; women's self-reports of depressive symptoms can increase, decrease, fluctuate, or remain unchanged throughout midlife. Historically, women's developmental change in midlife has primarily focused on negative perceptions of reproductive changes that occur during this time (Sampsel et al 2002). Past research tends to emphasize negative occurrences in midlife, such as the onset of chronic disease, the undesirable symptoms of menopause (e.g. bone deterioration, hot flashes), and significant changes to household structure (children leaving the home) (McQuaide 1998).

However, the complexity of women's lives in midlife can also foster positive changes, from improvements in emotional regulation (Magai and Halpern 2001) and intelligence (Baltes et al 1999) to achievements in greater self-awareness (Lachman and Bertrand 2001; Lachman 2004).

Hypothesis 2: Race differences in depressive symptoms at baseline are both mediated and moderated by socioeconomic characteristics. Reasons for the higher rates of depression for African Americans, and women in particular, are often attributed to blacks' higher rates of other health conditions as well as social factors such as a lack of healthcare coverage (Dunlop et al 2003) and lower rates of educational and financial attainment (Belle and Doucet 2003). At first glance, processes of socioeconomic achievement appear to mediate race differences in depression. However, past research suggests socioeconomic processes operate differently by race, which is reflected in race-specific relationships between SES processes and depressive symptomatology (Kessler and Neighbors 1986). Higher rates of chronic conditions, such as hypertension, among black women can prove to be detrimental for these women in regards to their reports of depression over time.

Hypothesis 3. Women reporting poor self-ratings of health and the presence of a major chronic disease are less likely to report favorable depressive symptoms over the 11-year period. A diagnosis of a potentially debilitating condition can affect reports of depressive symptoms in several ways. Intuitively, having a condition that can cause long-lasting impairment may lead to feelings of despair and sadness that can last as long, if not longer, than the diagnosed condition itself. Diseases such as hypertension and cancer often lead to increases in the amount of sick days missed from work, which, in

turn, results in a decrease in financial revenue. Therefore, chronic conditions, coupled with declines in financial well being, are significant contributors to depression in midlife.

Hypothesis 4. Age is a key identifier in understanding the differences in depressive symptoms in midlife. Literature detailing both the onset and prevalence of depression among female cohorts is mixed. However, current studies suggest increases in reports of depression in recent cohorts (Kessler 2003). It is important to explore the possibility that women at the “tail ends” of cohorts (e.g. the youngest and oldest cohort members) may possess behavioral or physical characteristics that are uniquely different than trends found in the overall cohort. For instance, the youngest women of the cohort are typically women who have younger children in the household and therefore possess a greater potential for reporting depressive symptoms. In turn, older women in the cohort may have a greater susceptibility as well, as the presence of debilitating health conditions appear.

Hypothesis 5: Changes in marital status and health conditions, such as self-rated health and disease prevalence, from baseline to the final timepoint will have an adverse impact on women with relatively higher levels of depressive symptoms. The health benefits of marriage are well-known. Married women, on average, report lower levels of depression in midlife (Earle et al 1998). Recent changes in marital status may affect women’s psychological well being, with those who move into marital unions possibly reporting lower levels of depression while women undergoing marital dissolution may exhibit increases in depressive symptoms. Likewise, how women feels about themselves, particularly as it relates to their peers, can have a strong and direct impact on depression rates. In a sense, both self-reports of health and CES-D-based depression measure self-

assessed psychological well being. In turn, new reports of major health changes, such as the onset of hypertension or heart disease, can lead to mounting stress levels, thus affecting how women view themselves.

Overview of NLS-Young Women

The data used for this study are drawn from the Young Women cohort of the National Longitudinal Surveys (NLS)². Created by the U.S. Department of Labor, the NLS is designed to assess the personal and occupational landscape of American women during the mid-20th century. Given the changing social and political climate of this time period, the NLS provides researchers with a wonderful opportunity to examine significant educational, familial, and career transitions at key points in women's lives. The Young Women cohort is a nationally representative sample of 5,159 teenage and young women who were between the ages of 14 and 24 at the initial year of 1968. These women were roughly between the ages of 39 and 49 in 1993, the initial, and primary, wave of this study's data analyses. These women were surveyed on a regular basis over three decades, with a final interview occurring in 2003.

The Young Women cohort was chosen for this series of analyses because of the extensive time period it covers in women's lives. The respondents were initially questioned during what developmental scientists define as emerging adulthood, which covers the crucial period of life occurring roughly between late adolescence and early

² Unless otherwise noted, the information provided in this chapter is derived from the NLS Young Women's Guide (2001).

adulthood (Arnett 1998; Arnett 2000). The NLS Young Women (NLS-YW) data also capture the complexities of midlife by providing a wealth of information on health status, financial and occupational careers, as well as familial responsibilities.

Specifically, the survey originally assessed the various labor force transitions and behavior of women. Over the years, the interviews also evaluated respondents' marital status, fertility, and educational experiences. In the earlier years, expectations regarding childbearing and childcare issues were addressed, as fertility is an important aspect of women's lives during these ages. As these women grew older, interviews were expanded to cover information about health, insurance (mainly retirement-related), and financial transfers of respondents and their families. In all, this extensive longitudinal survey offers information on key transitions in life, such as school-to-work, while providing a detailed backdrop for emerging (and prevailing) trajectories across the life course. Since the majority of the health-related questions were not implemented until 1993, the forthcoming set of analyses focuses on the survey years encompassing 1993 to 2003³.

Sampling Design

Approximately 5,533 women were designated on December 31, 1967 to be interviewed in the initial survey. This group of women represents those who were not institutionalized, in the Armed Forces, or who were not currently living outside of the United States. Approximately 93%, or 5,159 women, were actually interviewed during the initial wave of data collection in 1968. This longitudinal survey of young women

³ This time frame includes waves 1993, 1995, 1997, 1999, 2001, and 2003.

covers a 35-year time period with 22 interviews. During these 35 years, the young women, who were first interviewed at ages 14 to 24 in 1968, were last interviewed when aged 49 to 59 in 2003. The initial design plan was to interview respondents annually over a five-year period. However, given the high retention rate after the first five years, the NLS-YW was extended and a 2-2-1 interview schedule was adopted. In this interviewing pattern, each respondent was interviewed by phone approximately every two years and interviewed in person the year following the second phone-based interview. The 2-2-1 scheme was conducted until 1988, when a decision was made to conduct bi-annual interviews⁴.

Table 3.1 displays the number and percentage of women interviewed in each wave of the targeted 11-year time span (1993-2003). The NLS Young Women's cohort benefits from a relatively successful retention rate of its respondents. Approximately 62% of the entire initial sample was interviewed in 1993. By 2003, a little over half of the initial respondents (55.4%) remained in the study. The retention rate for blacks and whites was 51% and 57%, respectively.

Reasons for women not completing an interview during this 11-year span are provided in table 3.2. The majority of the noninterviews at each wave were the result of non-specific and congressional refusals. A larger percentage of women at baseline (13%) and at time two (12%), as compared to the later waves, were missing because of their inability to complete an interview in two or more years. Additionally, approximately 5% or less of women at each survey wave were deceased.

⁴ Due to 1990's decennial census, an interview was not conducted at that time.

Previously published analyses aimed at establishing a clear pattern of attrition by socio-demographic factors found that women of lower SES attainment and non-whites were more likely to not continue with additional waves of the survey (Rhoton and Nagi 1991; Zagorsky and Rhoton 1998). Attempts to chart attrition patterns are based on questions assessing the reason for not being interviewed in a given wave. Beginning with the 1971 survey, women were dropped if they had not been interviewed in two consecutive waves for reasons not related to death or refusal. However, in 1985, conductors of the NLS-YW made a concerted effort to re-interview the women that were previously dropped based on this criterion. Therefore, while the NLS Young Women's surveys span a considerable number of years, one must be cognizant of the occasional departure and re-entry of women into the survey at various points in time.

Table 3.3 provides a glimpse of key socio-demographic differences between women who dropped out of the survey prior to the 1993 wave and those who remained in the eligible sample (N=3,153). These differences are based on socio-demographic measures collected in 1968, the baseline year of the NLS-YW⁵. Overall, a larger percentage of blacks had dropped out of the survey by 1993. Attriters' average family income during 1968 was significantly lower than those who remained in the study. Because respondents were adolescents and young adults at the initial wave, an additional proxy for financial circumstances is the socioeconomic status of one's father or the head of one's household during early life (Davey Smith et al 1998; Lawlor et al 2004; Wannamethee et al 1996). One example of an efficient proxy is the Duncan Index for

⁵ With the exception of race and age, I use variables collected during the baseline year in order to capture responses collected at the same point in time.

respondents' fathers at the start of the survey, which revealed a marked difference in father's employment (and possible financial stability) between non-attriters and attriters. The Duncan Index scores for the fathers of attriters were, on average, five points lower than the scores of the fathers of women who remained in the sample. Although this measure does not account for women whose fathers are not in the household, it provides a general picture of the possible financial experiences women encountered earlier in life.

Dependent Variables: CES-D Scores

With increasing attention given to the importance of affect, personality, and depressive symptoms on health outcomes in adulthood, this study focuses on gaining further knowledge of mental health disparities among women in midlife. This particular time in life provides a complex backdrop for examining the interplay between mental and physical health. Changes in family structure, the evolution (or lack thereof) of financial and career trajectories, as well as the possible manifestation of chronic illness can all lead to alterations in psychological health that create feelings of despair and anxiety.

Additionally, examining what types of women (e.g. socioeconomically disadvantaged, African-American) suffer from higher levels of psychological distress can provide an excellent starting point to understanding psychological health throughout the life course.

In most national and international-based surveys, depression and overall psychological well being are often depicted by well-devised psychometric scales assessing depression. The primary tool in the NLS-YW for assessing psychological health is the widely used CES-D (Center for Epidemiological Studies Depression) scale.

Created by Radloff for the National Institute of Mental Health (NIMH), the goal of the CES-D scale is to evaluate population-level depressive symptomatology, usually over a two-week span (1977). Numerous studies have addressed the reliability and validity of the CES-D scale across different populations (Radloff 1977; Roberts 1980; Weissman et al 1977). The CES-D scale is often considered a “case-finding” questionnaire in evaluating clinical depression in community settings (Williams et al 2002). Once an individual is identified as having depressive symptoms through the CES-D scale, specific questions regarding the intensity and duration of the symptoms are typically addressed in the diagnostic criteria for assessing depressive disorders. Past studies have shown that self-reports of depressive symptoms often resemble reports of major clinical depression (Solomon et al 2001).

Although both longer and shorter versions of the scale exist, the original CES-D consists of twenty questions that assess whether individuals rarely, a little of the time, occasionally, or mostly experience specific feelings. Based on previous literature, the CES-D scale was found to measure roughly four separate factors: depressive mood, positive affect, somatic complaints, and interpersonal problems (Cole et al 2000; Radloff 1977). Table 3.4 shows the twenty questions that comprise the full-item CES-D scale. CES-D scores can range from 0 to 60, with scores equal to or greater than 16 and 23 signaling possible depression and apparent depression, respectively (Thombs et al 2001). Both of the sensitivity and specificity estimates for the full CES-D scale is quite high. Most studies report sensitivity estimates between 70-99% whereas specificity of the scale ranges from 56-94% (Gotlib et al 1995).

In the NLS-YW, respondents were asked to complete the full-item CES-D scale in the 1993 and 2003 waves. However, from 1995 to 2001, respondents were asked questions based on a reduced form of the CES-D scale, as highlighted in bold text in Table 3.4. Given the comparability of this particular shorter form to the full CES-D scale here and elsewhere (Miech and Shanahan 2000) and its availability in the waves spanning 1993 to 2003, the short 7-item version of the CES-D is used as the primary dependent variable and principal indicator of depressive symptomatology. Since the sum of the 7-item form is highly skewed with a mode of 0, I use the log transformation of the CES-D scores for each wave. The log transformation is achieved by taking the natural log of the sum of CES-D scores plus one, a procedure that is common in social science analyses (Anshensel, Rutter, and Lachenbruch 1991; Cole et al 2005; Miech and Shanahan 2000). Table 3.5 displays the mean, standard deviation, and alpha reliability for the transformed, short form CES-D scores for each wave. The alphas are all at or above 0.80, an acceptable indicator of reliability.

Table 3.6 illustrates the breakdown of the response patterns of depressive symptoms during the 11-year period. Out of the 3,153 women who were in the sample in 1993, approximately 60% (N=1,904) of the respondents provided data on depressive symptoms in each of the six consecutive survey waves. In order to consistently capture possible changes in depressive symptoms reporting, I chose to use only these women for the final analytical sample. Based on the average CES-D score of women in the final sample, these respondents are possibly less likely than those with incomplete CES-D data to be prone to depressive symptoms at each wave in the 11-year period (Table 3.7).

A further look at the demographic differences between the final sample and women without a complete CES-D history is illustrated in table 3.8. The final sample of women are older, less likely to be black, and more likely to be married. Women with completed CES-D responses throughout the survey also reported more favorable socioeconomic conditions in 1993. These women were, on average, slightly more educated and had higher family incomes and individual Duncan Index scores.

Independent Variables

Understanding depressive symptoms among midlife women requires an in-depth look into the biological, psychological, and social aspects of measures of health and illness. Table 3.9 provides a schematic view of the availability of all independent variables by survey year. In this study, the core covariates are characteristics of women's health, socioeconomic status, and familial experiences through all of adulthood. These indicators are important in establishing both the characteristics of the sample population as well as distinguishing key differences in the patterns of depressive symptoms reporting over time. The following section discusses the manner in which each covariate is included in the ensuing analyses. Since CES-D-related questions were not implemented until 1993, the covariates utilized for these analyses are largely derived from this survey year. A few exceptions, however, are incorporated into the study and are further described in this section.

I first discuss key demographic factors at baseline that potentially affect depression in women over time. Next, I incorporate a discussion on the inclusion of baseline socioeconomic indicators. Then, I include a discussion on the dimensions of

health utilized in the next set of analyses. Finally, I conclude with a discussion of the demographic, SES, and health variables created to incorporate change into the final set of analyses.

Demographic Variables

The impact of *age* on depressive symptoms proves to be an important, yet unclear, factor. By most accounts, the percentage of women reporting depressive symptoms has increased significantly over the latter half of the 20th century (Fonbonne 1999; Kasen et al 2003). However, this trend is not clear-cut; a recent study examining age by cohort interactions suggests that these increases in depressive symptoms are primarily confined to earlier cohorts of women (e.g. those born before 1944). Younger cohorts of women (post-1944 birth cohorts), in turn, exhibited slight declines in depression with age (Kasen et al 2003). The NLS-YW survey, which encompasses women born during the years of 1944 to 1954, provides a perfect backdrop in which to examine whether declines in this particular cohort indeed occur with age.

I calculate the age of each respondent by using their 1968 date-of-birth variable and an interview date of January 1st of each survey year. This method is consistent with the NLS's initial handling of the age variable. The 1968 age variable was calculated using a fixed interview date of December 31st, 1967 along with the 1968 date of birth. The women were between the ages of 39 and 49 at the beginning of the analyses in 1993 and approximately ages 49 to 59 at the end of the 2003 survey.

Race is another crucial demographic indicator that is included in these analyses. Although reports are mixed, most studies contend that black adult women typically report more depressive symptoms than their white counterparts (Gazmarariah, James, and

Lepkowski 1995), though the mechanisms driving this disparity remain unclear. Recent studies suggest that socio-demographic factors such as income, education, and marital status of black women across the life course, and particularly during middle adulthood, can provide insight into the disparities in reporting patterns of depressive symptoms.

Race is initially treated at the beginning of the data collection (1968) as a three-category variable encompassing responses of “black”, “white”, and “other.” This variable is based on interviewer observation at the initial household screening. Because race differences are one key focus of this study, I limit the analysis sample to black and white women and exclude the “other” category. This final category is too small to treat as a separate group. Moreover, the observation-based reporting of race precludes an assessment of ethnicity.

Both the occurrence and change in *marital status* can play an important role in women’s reports of depressive symptoms. In general, marriage is often viewed as a protective factor against psychological and physical illness. Married women in the U.S. are less likely to exhibit depressive symptoms than married men and non-married women (Bebbington 1998; Maughan 2002; Weissman and Klerman 1977; Weissman et al 1984). Single women (as opposed to married, widowed, or divorced) usually report higher rates of depression (Maughan 2002). Changes in marital status also affect reports of depressive symptoms among women. While an entry into a union typically fosters few reports of depressive symptoms whereas marital dissolution, including widowhood, often leads to a greater likelihood of reporting depressive symptoms (Stroebe and Stroebe 1987; Umberson, Wortman, and Kessler 1992; Willitts, Benzevel, and Stansfeld 2004).

The current marital status for each respondent in the NLS-YW is available in every interview year. Women are asked if they are married, widowed, divorced, separated, or never married. I created dummy variables indicating whether women were married, never married, or not married.

Additionally, having *children under the age of 18 in the home* can have a significant impact on depressive symptoms. Studies have shown that single mothers (regardless of age) are at a higher risk of experiencing depression (Brown and Moran 1997; Maughan 2002). According to a study using the National Survey of Families and Households, middle-aged, childless women are approximately 46% more likely to report depressive symptoms compared to women with children (Koropeckyj-Cox 1998). Although sufficient evidence links childlessness to depression, mothers with dependent children in midlife may experience bouts of depression as well. The stress of having to care for others, coupled with possible career responsibilities and potentially growing health concerns for oneself and others, could lead to depression. I compiled questions surveying the age of each family member named by the respondents in 1993 and created a count variable indicating the number of children in each household under age 18, the legal age of adulthood. This variable is created for the baseline year only.

Socio-economic Status Variables

Since the NLS was initially designed to assess labor market trends among American women, the NLS-YW is an excellent source for analyzing the socio-economic achievement processes of midlife women. The health literature draws heavily from prior sociological research in its definition of SES (Duncan 1961; Hauser and Featherman

1977; Sewell and Hauser 1975). Traditionally, SES is comprised of three main indicators: educational attainment, income, and occupational status. When used separately, each of these three indicators are strongly related to adverse health outcomes and mortality (Adler et al 1994; Duncan et al 2002; Krieger, Williams, and Moss 1997; Miech and Hauser 2001; Smith 1998; Winkleby et al 1992). Yet, recent studies suggest that these measures are not necessarily interchangeable (Duncan et al 2002; Krieger, Williams, and Moss 1997; Liberatos, Link, and Kelsey 1988; Winkleby et al 1992). In following with a more comprehensive view of SES, I utilize five different measures of SES—educational attainment, household income, employment status, Duncan Index, and job satisfaction—to capture women’s financial well being.

Though *education* is negatively correlated with depression (Glenn and Weaver 1981; Kessler 1982; Lennon and Rosenfield 1992; Link, Lennon, and Dohrenwend 1993; Miech and Shanahan 2000; Mirowsky and Ross 1989, 1995; Pearlin et al 1981; Ross and Van Willigen 1997), its role in the onset and persistence of depressive symptoms remains unclear. Low levels of educational attainment are associated with an increased risk of a number of chronic conditions, which in turn can lead to a greater likelihood of major depression. Contextual effects are important in the analysis of this relationship, as individuals with little to no education are more likely to inhabit disadvantaged neighborhoods. In these impoverished areas, women are less likely to be financially mobile and have fewer institutional and personal coping resources, leading to higher levels of adult depression (Ross 2000).

I utilize the discrete variable assessing the *highest grade completed*, which is provided in each wave of the survey. Since educational attainment of most women in this

sample is completed by middle adulthood, I only use the education variable for 1993 as a status indicator at baseline. I recode education in 1993 into dummy variables indicating whether respondents have less than a high school education, post-secondary education, or a high school diploma (reference).

In order to assess financial well being, I utilize the dataset's information on *total family income*, a time-varying variable, at baseline. Evaluating individual income would do little in the way of gauging women's financial well being. Additionally, focusing primarily on individual income could potentially lead to conservative estimates of SES, as women who have lower yearly income levels may be in dual-earner households, thus providing them with additional means of financial support. The overwhelming stress created by poverty is a strong and consistent predictor of depression in women (Belle and Doucet 2003). Poor women, on average, experience more frequent and severe negative life events, as a vast majority of women are in poverty with children (Bassuk et al 1998). I adjust for the skewed distribution of total family income by adding constants to eliminate negative reports of income and then computing the natural log of the variable for each wave.

Women's usual activities on a given day are important in establishing their work experiences in midlife. The NLS-YW provides a Census Bureau-created *employment status* measure that consistently recodes responses to various labor-related questions. Questions regarding women's activities, the number of hours they worked, occupational and worker class, as well as job patterns chronicling absences and job searches were all documented to create a single question characterizing women's current activities. From this compilation an employment status variable is produced placing women's activities in

1993 into the following categories as either: 1) working; 2) with a job but not at work; 3) looking for work or on layoff; 4) going to school; 5) keeping house; 6) unable to work; or 7) other. I create a dichotomous variable for each wave where (1) represents individuals who are employed –that is, those who report either currently working or with a job, but not at work at the time of the interview.

Because careers are the focal point of the lives of many individuals in middle adulthood, *job satisfaction* can greatly influence psychological well being. The relationship between job satisfaction and depression is well documented in occupation-specific literature, from research on stress and job satisfaction of academic physicians (Linn et al 1985) to studies highlighting the correlation between job satisfaction and psychological distress among hospital nurses (Decker 1997; Packard and Motowidlo 1987). In the NLS-YW, women were asked if they liked their job very much, liked it fairly well, disliked it somewhat, or disliked it very much. I create a variable indicating those who liked their jobs (either very much or fairly well) versus those who did not like their jobs, regardless of the degree of dissatisfaction. Women were asked about their attitudes towards their careers at baseline.

An additional measure I use to illustrate the socioeconomic attainment processes in these women is the *Duncan Index of Dissimilarity*. The index is a categorical variable and is assigned based on an occupational, 3-digit code. The index, which is a measure of occupational atypicality, can have a significant impact on depression. Previous research shows that low occupational prestige is linked to a greater likelihood of depression for women in adulthood (Levenstein, Smith, and Kaplan 2001).

Physical Health Conditions

Health status measures were incorporated into the analyses as well. As with the other predictor variables, table 3.9 illustrates the availability of the health indicators. Unlike the prior demographic and SES variables used in these analyses, the health status measures are not uniformly integrated into the baseline year. The following section describes these health status measures and how they are utilized in detail.

Self-reports of general health status can directly impact one's reports of depressive symptoms. Past studies have shown that *self-rated health* is strongly and independently related to depressive symptoms in adulthood (Leibson et al 1999; Mulsant, Ganguli, and Seaberg 1997). At baseline, women were asked how they perceive their general health status when compared to women of the same age. Based on this criterion, respondents rated their health as excellent, good, fair, or poor.

Two variables, BMI and health limitations, were asked only during the 1991 wave prior to the start of 1993. Because these variables are important in understanding risk factors related to depression, I include the lagged measures of BMI and health limitations. Previous studies suggest that obese women are at a greater risk for depression, with poor body image becoming an important aspect for psychological decline (Dixon, Dixon, and O'Brien 2003). Similarly, poor physical functioning is associated with an increased risk for depression in population-based studies (Geerling et al 2000).

Body Mass Index (BMI) is an indicator of body composition and the susceptibility to various diseases. BMI is defined as weight in pounds divided by height in meters squared, multiplied by a conversion factor of 703. Although BMI is often studied within

the context of physical health problems, BMI is linked to declines in mental health as well. Past population-based research has shown that obesity accounts for a 37% increase in the odds of major depression in adult women (Carpenter et al 2000; Stunkard, Faith, and Allison 2003). This relationship is mediated by other key mechanisms. For example, obesity greatly increases the likelihood of hypertension, cardiovascular disease, and a host of other chronic conditions, which in turn can also have a significant impact on psychological well being (Onyike et al 2003; Visscher and Seidell 2001).

The NLS-YW includes the height, in feet and inches, and weight, in pounds, of women in 1991. From these variables, I created dummy variables representing underweight (BMI below 18.5), overweight (BMI between 25.0 and 29.9), obese (BMI greater than 30.0) and the reference category of normal weight (BMI between 18.5 and 24.9). These guidelines are widely used and are based on federal guidelines for classifying weight (Centers for Disease Control 2007; National Institutes of Health 1998). Difficulty in performing *Activities in Daily Living (ADLs)* are included as an independent variable and is used as a measure of disability in long-term care research (Freedman, Martin, and Schoeni 2002; Kasper et al 1999; Manton, Corder, and Stallard 1997; Travis and McAuley 1990). Respondents were asked whether health is limited by any of the specified activities. Women were asked if they had problems with any of the following activities: 1) walking; 2) lifting or carrying up to 10 lbs; 3) using stairs or inclines; 4) reaching; 5) standing for long periods of time; 6) sitting for long periods of time; 7) using hands and fingers; 8) stooping, kneeling, and/or crouching; 9) seeing; 10) hearing; and 11) dealing/interacting with people on a regular basis. This indicator is dichotomous; respondents answered yes if they had problems with any of these activities in 1991.

Therefore, there is no way one can decipher the severity (e.g. number of limitations) of limitations with this particular question.

The presence of *major chronic health conditions*⁶ can directly impact the occurrence of depression for women in midlife. Past research has shown that conditions such as heart disease are associated with depressive symptoms and can act as both a precursor as well as a comorbid condition (see Rugulies 2002 for a review) Middle adulthood represents a period in life when health conditions are of great concern, as obvious signs of the onset of chronic ailments surface. Subsequently, the increasing symptoms of diseases such as cardiovascular disease and diabetes can have a tremendous impact on psychological well being. For instance, chronic depression is a key independent risk factor for cardiovascular-related mortality (Sesso et al 1998; Wassertheil-Smoller et al 2004).

Measurements of chronic conditions among women in these analyses are based on self-reports of a doctor's diagnosis of major health problems in 1995. This set of questions asks, "has a doctor ever told respondent she had [health condition]?" On the surface, this question does an adequate job of obtaining information on the occurrence of a debilitating condition. However, it is worth mentioning that estimating disease prevalence in a population in this manner may lead to conservative reporting. By asking whether a professional diagnosis is established assumes that respondents have actually visited a healthcare facility because of either a routine care visit or because of noticeable

⁶ The major chronic health conditions used in the analysis are restricted to the doctor-diagnosed conditions available during the targeted survey waves. Conditions such as diabetes were asked once prior to 1993 and do not necessarily reflect physician/health professional diagnoses (e.g. "Do you have....").

symptoms (Kehoe et al 1994; Vargas et al 1997). Respondents are asked whether or not a doctor ever told them they had *a heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems*. Since heart disease is the leading cause of mortality of women in adulthood, the presence of any type of heart condition is imperative in establishing disparities in depression of women in midlife.

Additionally, women were asked if a doctor ever told them they had *high blood pressure or hypertension*. Hypertension is associated with depression in women, both directly and through other factors such as lower levels of social support and a greater number of stressful life events (Levenstein, Smith, and Kaplan 2001).

The occurrence of *cancer or a malignant tumor of any kind* (except skin cancer) as of 1995 is also addressed. Literature documenting the relationship between women's depression and cancer is heavily concentrated on the processes by which psychological distress is shaped by breast cancer. The rigorous chemotherapy and other medical treatments for cancer have been directly associated with depression prevalence in adult women. Persistent bouts of depression can negatively affect cancer treatment, impede quality of life, and increase the number of hospital stays (Hann, Winter, and Jacobsen 1999; McDaniel et al 1995). Although treatment regimen is notoriously rigorous, past research suggests that the link between treatment and depression is no higher than the depression percentages attributed to other major chronic conditions (see Spiegel and Giese-Davis 2003 for a review).

By definition, *menopause* is the permanent cessation of menstruation (Hardy and Kuh 2002). Naturally occurring menopause is when a woman has no menses for over 12 or more consecutive months, in the absence of pregnancy or other known cause

(McKinlay 1996; World Health Organization 1981). In 1995, respondents are asked if they *have gone or are going through menopause*. The menopause transition, not the act itself, has been targeted in women's health research as a contributor to both the incidence and prevalence of depression. Entering menopause at an earlier stage in life increases the risk of depression in women with no prior history of major depression (Cohen et al 2006). Additionally, other studies contend that a long perimenopausal or transitional period (at least 27 months) increases the likelihood of depression in women.

As indicated in table 3.9, a host of variables are available not only at baseline but also in subsequent waves as well. However, my primary research questions evolve around establishing distinct patterns of depressive symptoms over time and evaluating the impact of demographic, SES, and health status measures at baseline. In other words, I am interested in how these differences in symptoms reporting are initiated. My inclusion of health status measures occurring both before and after the baseline are implemented to provide a more robust measure of physical health that is not achieved by the self-rated health measure at baseline.

Although it is important to understand the manner in which different circumstances set women on different depressive symptoms pathways, it is also imperative to assess the impact of any potential change in significant status measures on the perpetuation of disparities in symptoms reporting. In order to examine my final research objective, I create crude change variables using only the 1993 and 2003 responses to specific status measures.

The calculated change variables for the analyses of this chapter represent measures that historically have had a significant impact on the health and overall well

being of women in midlife. Among the demographic measures, I created two dichotomous variables assessing possible change in marital status between the periods of 1993 and 2003. One variable represents women who were married in 1993, but stated that they were not married, for whatever reason, in 2003. Conversely, the second variable represents women who were not married in 1993 but who were indeed married in 2003. Previous research on midlife women show that married women report lower levels of depression (Earle et al 1998); therefore, potential changes in marital status may have an adverse (or beneficial) effect on women's psychological well being.

Changes in SES-related indicators are also important in examining the various depression-related transitions that occur in midlife. I created two dichotomous variables assessing changes in employment status similar to those indicating marital change. One variable characterizes women who were employed at the time of the 1993 survey, yet were not employed by the 2003 wave. In turn, the contrasting variable is indicative of those who were not employed in 1993 but were working in 2003. Changes in employment status where women are transitioning out of the labor force, for example, may correlate with increases in depression prevalence, given the inverse relationship between paid employment and depression rates in previous population-based studies (Anthony & Petronis 1991; Brown & Harris 1978; Cochrane & Stopes-Roe 1981; Gutiérrez-Lobos et al 2000). Additionally, I incorporated the log of the annual household income for 1993 as well as for 2003 in order to compensate for significant changes in household income over the 11-year period.

For the self-rated health variables, I created two dichotomous variables each for the three sub-categories of self-rated health, similar to the recoding executed in the

previous change variables. For instance, the first variable indicates whether a woman reported a particular perception of herself in 1993 (e.g. excellent, good, or poor) but not in 2003. The second variable is the opposite of the preceding variable. Potential changes in self-reports of health may be indicative of subsequent changes and fluctuations of psychological health.

Finally, I created one change variable each for hypertension, heart problems, and menopause. For each measure, dichotomous variables characterized women who had not experienced the specific condition as of 1995, but had been diagnosed with the condition by the 2003 survey year. Unlike the prior change variables, it is unnecessary to create contrasting change variables for these three health occurrences, since one cannot undo incidences of hypertension, heart problems, or menopause.

Because I use a longitudinal dependent variable (CES-D) and independent variables collected during different waves, I present unweighted results throughout the entire dissertation. The NLS-YW includes wave-specific sampling weights that are extremely useful for cross-sectional analyses. However, these sampling weights cannot accurately account for responses of women who do not report any information at any time point between 1993 and 2003.

Research Methods

The overarching theme of this research agenda is to uncover the disparities in depressive symptoms of women in midlife. This research takes a first pass at establishing both the change and overall pattern of depressive symptoms among women and how

these depressive symptom patterns differ by key demographic, social, and health variables.

In general, the analyses are divided into four primary sections covering the 11-year span in which the CES-D scores were provided (1993-2003). First I set out to tackle my first research objective of establishing distinct patterns of depressive symptoms among women across six waves. In chapter 4, I use a series of k-means cluster analyses to identify the longitudinal patterns over this 11-year span. I propose that the variability found in life's various domains during this period would lead to substantial variability in patterns of depressive symptoms. Next, I performed a series of bivariate analyses to characterize women's membership in each depressive symptoms cluster and to tease out any compositional differences in cluster membership. Based on previous literature, I hypothesize that both age and race would play a prominent role in understanding differences in patterns of depressive symptoms.

The next three chapters follow the same format. Each of the analysis chapters is divided into two main sections. The first section employs bivariate analyses to evaluate how women within the same depressive symptoms group vary on important status measures. Next, I examine multinomial logit models (mnl) using the cluster groups identified in chapter 4 to decipher what status measures predict being in a particular depressive symptoms trajectory.

Multinomial logit analyses are ideal for evaluating models with multiple, unordered outcomes (Borooah 2002). As part of the generalized logit model, multinomial logit models seek to analyze individuals as the primary unit of analysis and their individual-based characteristics as the predictor variables (Hoffman & Duncan

1988). The corresponding statistical model for multinomial logit analysis can be written as the following:

$$P_{ij} = \exp(X_i\beta_j) / \sum_{k=1}^J \exp(X_i\beta_k),$$

where X_i represents the attribute of the individual (i) and β is the corresponding vector for the parameter. J stands for the number of unordered categories in the dependent variable, while P_{ij} represents the probability of an individual (i) being in a given category j (Hoffman & Duncan 1988). Because the individual-based explanatory variables (X) are constant across the categorical dependent variable, multinomial logit analysis estimates a set of $J - 1$ coefficients (β_j) for each of the predictors. Thus, the computed coefficients in a multinomial logit model represents X variables' impact on the probability of being in one category of the dependent variable relative to the category that serves as the reference group. As a result, one set of coefficients are normalized, with the coefficients set to zero. In the end, only J parameter vectors are needed to solve a multinomial logit model where there is $J + 1$ parameters (Greene 2003). The probabilities, then, are (Hoffman & Duncan 1988):

$$P_{ij} = 1 / \sum_{k=1}^J \exp[X_i(\beta_k - \beta_j)].$$

Figure 3.1 provides an overview of the main covariates utilized in each chapter. Chapter 5 incorporates a basic demographic mnl model (1) and then adds SES indicators (2) to examine the role socioeconomic circumstances. Given the importance of age in studying any type of trajectory across the life span, I attempt to explain whether changes

in depressive symptom trajectories is an artifact of aging by testing for a potential quadratic form of the age variable, both centered and non-centered. Interactions involving race and various measures of socioeconomic status are included to examine the interactive nature of race differences in explaining depression trajectories. Chapter 6 follows a similar format, where physical health indicators (3) are added to the SES measures.

**Table 3.1 Number and Percentage of Women in Each Wave of Analysis, 1993-2003^a,
National Longitudinal Surveys of Young Women**

	Number	Percentage of Original
Survey Year	Interviewed	Sample Interviewed
1993	3,153	61.86%
1995	2,985	58.56%
1997	3,017	59.19%
1999	2,868	56.27%
2001	2,775	54.44%
2003	2,825	55.42%

^a primary years of analysis

Table 3.2. Reason for Noninterview, 1993-2003, National Longitudinal Surveys of Young Women

Survey Year	Number Not Interviewed	Unable to Contact	Moved	Failed after			In an Institution ^a	Refused ^b	Deceased	Other	Dropped, not in survey 2 years	% Original Sample
				repeated attempts	Temp. Absent							
1993	1944	58 2.98%	194 9.98%	45 2.31%	5 0.26%	16 0.82%	1239 63.73%	104 5.35%	30 1.54%	253 13.00%	38.14%	
1995	2112	37 1.75%	182 8.61%	99 4.69%	11 0.52%	12 0.57%	1342 63.55%	123 5.82%	53 2.51%	253 11.98%	41.44%	
1997	2080	102 2.00%	182 3.57%	88 1.73%	12 0.24%	18 0.35%	1261 24.74%	162 3.18%	2 0.04%	253 4.96%	40.80%	
1999	2229	96 1.88%	213 4.18%	12 0.24%	19 0.37%	17 0.33%	1370 26.87%	194 3.81%	55 1.08%	253 4.96%	43.73%	
2001	2322	119 2.33%	184 3.61%	91 1.79%	22 0.43%	21 0.41%	1307 25.64%	233 4.57%	92 1.80%	253 4.96%	45.56%	
2003	2272	57 1.12%	131 2.57%	69 1.35%	19 0.37%	18 0.35%	1414 27.74%	269 5.28%	42 0.82%	253 4.96%	44.58%	

^aThis category encompasses women who were institutionalized or in the armed forces at the time of the survey questioning.

^bThis category includes non-specific and congressional refusals.

Table 3.3. Overall Characteristics of Non-Attriters vs. Attriters at the First Analysis Wave, 1993, National Longitudinal Surveys of Young Women

	Non-Attriters	Attriters	t-value
Age in 1993 (avg. in years)	44.15	44.3	1.70
Race (percentage)			
Non-Hispanic Black	24.42	35.44	8.46***
<i>Status & Values in 1968</i>			
Married, (percentage)	29.63	31.24	1.22
Years of Schooling (average)	10.82	10.72	1.52
Employed (percentage)	40.31	38.89	1.01
Family Income (average, in \$1,000s)	6,136	5,665	2.47*
Duncan Index (average)	32.07	31.78	0.42
Father's Duncan Index (average)	36.34	31.83	5.31***

N	3,153	1,944
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Table 3.4. The Center for Epidemiologic Studies Depression (CES-D) Scale, Full 20-Item^{ab}

In the past week ,

Somatic Complaints:

- 1) I was bothered by things that usually don't bother me.
- 2) I did not feel like eating; my appetite was poor.
- 3) I had trouble keeping my mind on what I was doing.**
- 4) I felt that everything I did was an effort.**
- 5) My sleep was restless.**
- 6) I talked less than usual.
- 7) I could not "get going".**

Positive Affect:

- 15) I felt that I was just as good as other people.
- 16) I felt hopeful about the future.
- 17) I was happy.
- 18) I enjoyed life.

Depressed Mood:

8) I felt that I could not shake off the blues even with help from my family.

9) I felt depressed.

10) I thought my life had been a failure.

11) I felt fearful.

12) I felt lonely.

13) I had crying spells.

14) I felt sad.

Interpersonal Problems:

19) People were unfriendly.

20) I felt that people disliked me.

^aShort-form, 7-item scale is in bold.

^bScale: (0) Rarely or none of the time/0 days; (1) Some or a little of the time/1-2 days; (2) occasionally or a moderate amount of the time/3-4 days; (3) most or all of the time/5-7 days

Table 3.5. Mean, Standard Deviation, and Reliability Coefficients, CES-D Scale, Reduced 7-item, 1993-2003

	1993	1995	1997	1999	2001	2003
Mean	3.71	2.76	3.38	3.3	3.42	3.19
Standard Deviation	4.32	3.62	4.07	4.07	4.28	4.08
Reliability Coefficient	0.82	0.81	0.8	0.8	0.8	0.81
Skewness	1.52	1.94	1.73	1.71	1.71	1.67
N	1904	1904	1904	1904	1904	1904

^aRange of scale: 0 to 21

Table 3.6. Number of Completed Sets of CES-D Scores, National Longitudinal Surveys of Young Women, 1993-2003

Number of Waves/ CES-D Data Completed	Number of Women	Percent of Eligible Sample
No CES-D information	11	0.35%
1 Wave of Data	121	3.84%
2 Waves of Data	139	4.41%
3 Waves of Data	222	7.04%
4 Waves of Data	258	8.18%
5 Waves of Data	498	15.79%
All 6 Waves of CES-D Data	1,904	60.39%
N	3,153	100.00%

Table 3.7. Descriptive Statistics for CES-D of Women in Final Sample vs. Women with Incomplete CES-D Scores for a Given Wave, National Longitudinal Surveys of Young Women, 1993-2003				
	Final Sample (Complete CES-D)		Incomplete CES-D	
	Mean	St. Dev.	Mean	St. Dev.
CES-D Availability				
Wave 1	3.71	4.32	4.14	4.80
Wave 2	2.76	3.62	3.19	4.21
Wave 3	3.38	4.07	3.69	4.85
Wave 4	3.30	4.07	3.51	4.53
Wave 5	3.42	4.28	3.86	4.83
Wave 6	3.19	4.08	3.35	4.30

Table 3.8. Demographic Characteristics of Respondents with Complete CES-D Data vs. Respondents**Without Complete CES-D Data, 1993, National Longitudinal Surveys of Young Women**

	Respondents w/ Complete CES-D Scores	Respondents w/out Complete CES-D Scores	t-value
Age in 1993, (avg. in years)	44.28	43.95	-2.93**
Race (percentage)			
Non-Hispanic Black	21.06	29.54	5.42***
Married in 1993, (percentage)	68.96	59.78	5.30***

# of Children in Household in 1993 (average)	0.91	0.80	-1.22
Years of Schooling as of 1993 (average)	13.58	13.04	-5.62***
Avg. Family Income (in \$1,000s)	53,348	38,873	-10.16***
Employed (percentage)	81.57	74.94	4.47***
1993 Duncan Index (average)	47.27	44.15	-3.79***
Perception of Health Compared to Women of Same Age, 1993			
Excellent, (percentage)	39.02	33.74	2.98**

68

Good, (Percentage)	46.59	45.70	0.49
Fair, (Percentage)	11.19	14.00	2.34*
Poor, (Percentage)	3.20	6.55	4.40***
Any Health Limitations in 1991 (percentage)	30.46	33.19	1.56
N	1,904	1,249	

Table 3.9. The Availability of Independent Variables by Survey Year, National Longitudinal Study of Young Women

Independent Variable	Survey Year						
	1991 ^a	1993	1995	1997	1999	2001	2003
Demographic Variables							
Age		X	X	X	X	X	X
Race ^b		X					
Marital Status		X	X	X	X	X	X
# of Children in Home		X					
Socioeconomic Status							
Years of Schooling		X	X	X	X	X	X
Household Income		X	X	X	X	X	X
Employed		X	X	X	X	X	X
Job Satisfaction		X	X	X	X	X	X
Duncan Index		X	X	X	X	X	X
Health Conditions							
Self-rated health		X	X	X	X	X	X
Body Mass Index	X						
Chronic Conditions ^c			X	X	X	X	X
Menopause			X	X	X	X	X
Any Health Limitations	X						

^a Several key indicators of potential depressive symptoms are asked prior to 1993 and are included in the analyses.

^b Respondents reported their race during the initial wave in 1968.

^c Chronic Conditions include doctor-diagnoses of cancer, hypertension, and heart problems.

Chapter 4

Establishing Patterns of Depressive Symptoms among Women in Midlife

In Chapter 3, I discussed the two primary goals of establishing profiles of depressive symptoms among middle-aged women as well as deciphering the key health, financial, and socio-demographic variables that distinguish each trajectory in this population. In this chapter, I identify and characterize patterns of depressive symptoms, as measured by CES-D scores across time, in this adult female population. By doing so, I evaluate depressive symptoms using methods highlighting interindividual differences in intraindividual change.

The study of development rests on three key precepts of variability: intraindividual variability, intraindividual change, and interindividual differences (Nesselroade 1991). Used initially to study personality, intraindividual variability is commonly defined as reversible fluctuations and changes that occur over short, rapid periods of time (Nesselroade 1991; Nesselroade and Featherman 1997; Nesselroade and Ram 2004). An example of this form of change would be the analysis of moods and emotions, two individual-based behavioral states that are likely to change over different time periods. Identifying and studying patterns of association are important in addressing intraindividual variability. For example, intraindividual variability seeks to examine whether a given individual who possesses extreme variability on one dimension will also possess similar patterns of variability on other dimensions (Nesselroade and Featherman 1997). In contrast to intraindividual variability, intraindividual changes are often slower

processes that represent a person's changing characteristics at both a given period as well as over time. Finally, another aspect of change involves interindividual differences (or similarities), which are characterized by highly stable rates of change occurring over extended periods of time between individuals. This stability between people is a result of the magnitude of intraindividual variability and intraindividual change.

Identifying both intraindividual and interindividual differences in reports of depressive symptoms is important in explaining the nature of the onset and prevalence of depression in midlife and beyond. Understanding what drives the patterns of depressive symptoms within individuals can provide further insight into group-level differences in patterns of midlife depression. Past research has shown that intraindividual variability can predict additional interindividual characteristics, as intraindividual variability in variables such as infants' heart rates forecasts temperament and other adult personality traits (Fox and Porges 1985; Kagan 1994; Nesselroade and Ram 2004).

Additionally, by looking at change over multiple points in time within individuals, we can gain better insight on the individual-level effects of sociodemographic characteristics on health. Although most studies tackle disparities by partitioning and analyzing data based on well-known differences such as race or SES, individual variability over time may lead to the grouping of people in datasets based on other characteristics. For instance, would poor African American and white women report similar depressive symptoms over time or would the timing of major life events, such as menopause or job loss, play a major role in characterizing those who exhibit a particular depressive symptoms trajectory? These questions benefit from the advances of research on interindividual differences in intraindividual change.

As stated earlier, the primary goal of this chapter is to provide a first pass at establishing patterns of depressive symptoms over an 11-year time frame for middle-aged women in the NLS-YW. Once distinct patterns are achieved, I examine the characteristics of women in each depressive symptoms profile in an attempt to gain a clearer understanding of women's reports of depressive symptoms over time. Surprisingly, very little research has focused on presenting longitudinal profiles of depressive symptoms for women in midlife. When depressive symptoms profiles are examined among midlife women, research tends to narrowly focus on the relationship between depressive symptoms and distinct life outcomes, such as menopause (Avis et al 1994; Cohen et al 2006; Woods, Mariella, and Mitchell 2002). To my knowledge, this is the only study that has examined patterns of depressive symptoms among American women over more than three survey waves.

Methods

I utilize clustering analysis (SPSS version 15.0) as the main analytical method for identifying distinct clusters based on CES-D scores. Often used in theory building exercises, cluster analysis is a helpful tool in determining the intrinsic shape of clustered data when the only information available is the observed values (Fraley and Raftery 1998; Milligan and Cooper 1987). Cluster analysis achieves this grouping through the partitioning of available data into a meaningful, pre-determined number of subgroups. By creating mutually exclusive groups, cluster analysis attempts to reduce within-group variance while maximizing between-group variance. As a result, cluster analysis

produces groups that share similar patterning of variables on the outcome, but vary on other factors that may be predictors of the outcome. Therefore, significant between-group differences can exist while individuals within a given group can exhibit similar characteristics on some dimension, such as depressive symptoms (Aldenderfer and Blashfield 1984; Hartigan 1975). Past research has viewed clustered data as "mixtures of multivariate normal populations," mainly because one can create subgroups of data and form smaller, distinct subpopulations, thus forming a mixture of populations within a dataset (Blashfield 1976; Fleiss and Zubin 1969; Wolfe 1970).

Given its efficiency in handling a large number of cases, I specifically use the K-means (quick means in SPSS) algorithm of the cluster analysis method to group women in the NLS-YW based on their depressive symptoms scores. This popular method seeks to capture within-cluster homogeneity through the calculation of the sums of squares within each cluster. Cluster membership is achieved by conducting iterative passes through the data that moves cases from cluster to cluster until the sum of squares within clusters is minimized and the defined iteration limit is obtained (Aldenderfer and Blashfield 1984; Ding and Xe 2004; Jain and Dubes 1988). In essence, K-means clustering minimizes the maximum distance of a case from its cluster center, or the average value of all observations in each cluster (Kristeller and Rodin 1989). The basic premise of the K-means algorithm is as follows:

K-means assigns a set of cases into K clusters in order to minimize the within cluster sum of squares.

Let x_{cj} represent the observational value of case c in variable j and \bar{u}_{kj} denote the center (mean) of cluster k in variable j :

$$SQ_{in}(K) = \sum_k \sum_{g \in k} \sum_j (u_{cj} - \bar{u}_{kj})^2 \rightarrow \min. \quad 4.1$$

The preceding function subsequently minimizes the sum of squares. $\sum_j (u_{cj} - \bar{u}_{kj})^2$

represents the squared (Euclidean) distance $d_{c,k}^2$ of case c to the cluster's (k) mean. As a result, the K-means algorithm can be written in the following manner (Bacher 1996). The cluster centers are then computed iteratively.

$$SQ_{in}(K) = \sum_k \sum_{g \in k} d_{c,k}^2 \rightarrow \min. \quad 4.2$$

The initial, and possibly most debatable, step in K-means cluster analysis is to determine the optimal number of clusters before running any analyses. There are numerous heuristic approaches to this problem (Milligan and Cooper 1987; Halkidi, Batistakis, and Vazirgiannis 2001; Sugar and James 2003) and little consensus as to which technique best validates the optimal number of clusters. One of the oldest and most popular validations of the number of clusters is the "elbow" criterion (Jain, Murty, and Flynn 1999). This criterion is based on the premise that as one increases the number of clusters, the within-cluster distance between any give data points in that cluster will decrease. When graphed, this decrease is shaped similar to an elbow (Chen et al 2007). An elbow criterion graph shows that there are an optimal number of clusters. Once that

number is achieved, adding additional clusters does not substantially improve the classification with regards to meaningful information.

Results

Figure 4.3 illustrates the elbow criterion, which utilizes the NLS-YW sample that had available data on CES-D scores for all years (N=1902). The proportion of total variance explained is plotted against the number of clusters examined⁷. The variance explained begins to bend, creating an "elbow" around k=4 and k=7. Therefore, I conducted K-means cluster analyses designating the number of clusters as both four and seven⁸. For the remaining analyses, I chose to utilize the four groups to represent possible trajectories of depressive symptoms for several reasons. First, I could not discern any clear pattern of depressive symptoms reports over the 11-year period with the seven clusters. Aside from two groups exhibiting steady low and high depressive symptoms over time, the remaining five clusters showed considerable variability from each wave, thus making it difficult to establish significant trends in the data. Also, because the N's for the seven clustered groups were relatively low, increasing the number of clusters reduced the power of subsequent statistical procedures without gaining any appreciable conceptual clarity of distinction among patterns⁹.

⁷ The proportion of total variance is calculated as one minus the ratio of the sum of the within-cluster sum of squares to the entire dataset's sum of squares.

⁸ As a precautionary measure, I also ran K-means cluster analyses with K= 2 through 10.

⁹ The results from the seven cluster analyses are not presented here.

Figure 4.4 illustrates the four groups identified through the clustering of the CES-D scores from the six waves of data. Listwise deletion was used to account for missing cases in the analysis. Approximately 1,902 women provided answers to the seven questions on the CES-D's short version. Based on the available data, four key clusters emerged.

Cluster 1 included 648 women whose CES-D scores were consistently low throughout the entire 11-year period, as compared to the logged transformation of CES-D scores for the rest of the sample. I labeled this trajectory *stable low depressive symptom (LoS)*.

Cluster 2 is comprised of 405 women whose CES-D scores remain relatively high, as compared to others within the population, across each wave. This group is therefore labeled as *stable high depressive symptoms (HiS)*.

Cluster 3 (N=505) represents women who reported relatively higher scores of depressive symptoms in the first wave and subsequently reported lower scores that level off from 1999 to 2003. These women are characterized by *decreasing depressive symptoms (Dec)*.

Finally, in cluster 4, approximately 344 women saw an increase in the number of depressive symptoms throughout the time period until 2001, when reports of depressive symptoms leveled off. These women are classified as respondents who exhibited *increasing depressive symptoms (Inc)*.

These four groups represent four interesting trends in the trajectory of depressive symptoms in midlife. In general, the prevalence of depressive symptoms among women is higher than among men, and this disparity is evident as early as age 11 (Kessler et al

1994). High depression rates are also known to continue through the end of midlife in some groups of women (Kessler 2003). Therefore, those exhibiting consistently higher rates of depressive symptoms (cluster 2) throughout this sample are possibly representative of women suffering from persistent bouts of depressive symptoms spanning over the life course. In turn, women displaying consistently low levels of depressive symptoms (cluster 1) throughout this 11-year period are intriguing in their own right. Regardless of the numerous physiological, social, and developmental changes that are occurring during middle age, these women are perhaps most adaptive to their life circumstances. Additionally, both the increasing and decreasing of levels of depressive symptoms in clusters 3 and 4 may represent a response to major life events within this time frame that can only be captured through a more detailed look at the women of each group.

In order to characterize the groups, I conduct several bivariate analyses with important predictors assessed in the initial wave of CES-D reporting (1993). The ensuing tables provide results for the differences between women in the stable high depressive symptoms group and those in the other three depressive symptoms groups. Specifically, I use univariate analysis of variance (ANOVA) and two-sample t-tests to compare the differences between the means and percentages of predictor variables for the HiS women versus other women, respectively.

Table 4.1 shows the means and percentages of key demographic variables by cluster membership. Black women are overrepresented in the HiS cluster, compared to women in the stable low (LoS) and decreasing (Dec) groups. Significant differences also exist between HiS women and LoS women in marital status at the start of the analysis.

HiS women are less likely to be married, although the percentage of women married in 1993 for both groups exceeds 60%. A majority of all women have less than four children under the age of 18 in their household; approximately half of all women in each cluster have no underage children. HiS women are less likely to have 1 to 3 children, compared to LoS women. Discrepancies also exist between HiS and Inc women. HiS women are more likely to have four or more underage children than Inc women, although both percentages are considerably low. Perhaps one of the most important findings in table 4.1 is the fact that the average age of women does not vary across the four depressive symptoms groups.

Table 4.2 illustrates significant baseline SES differences between HiS women and other respondents who completed depressive symptoms questions at each wave. Women reporting consistently high levels of depressive symptoms are least likely to have a high school diploma and are generally less well-educated than women in the other clusters. HiS women also have the lowest average family income in 1993, reporting incomes fifty percent lower than the 1993 average family income of LoS women, and almost one-third lower than women in the Dec and Inc clusters.

Further evidence of HiS women's socioeconomic disadvantages are exhibited in employment indicators. These women are less likely to be employed at baseline when compared to women in each of the other depressive symptoms clusters. Only 67% of HiS women are employed, whereas over 80% of women in each of the additional three depressive symptoms clusters are working for pay during the same time. In addition, the HiS women who are working are in less desirable occupations, as evident in the significantly lower average Duncan Index scores. Moreover, HiS women are less likely

to report that they like their job “very much” when compared to LoS and Inc women and are more likely to hold some level of displeasure for their job when compared to women in the same two depressive symptoms group.

Differences between the health of HiS women and other women in the sample are shown in table 4.3. While over 60% of HiS women report either excellent or good health when compared to women of the same age, this percentage is noticeably lower than for women in the stable low, decreasing, and increasing depressive symptoms groups. The difference in reports of excellent health between HiS women and other respondents is substantial; the percentage differential ranges between 18% and 43%. HiS women also report a significantly higher percentage of fair or poor health than women in all three depressive symptoms groups during the 1993 survey wave.

As stated elsewhere, reports of height and body weight are not consistently available. Therefore, I utilize the height and weight measurements from 1995, the only wave during the 11-year span that provides these results, to compose a body mass index (BMI) score. Women who continuously reported high levels of depressive symptoms from 1993 onward were less likely to be of normal weight in 1995 when compared to women with consistently low depressive symptoms and decreasing depressive symptoms over time. A larger percentage of HiS women were obese than those in the LoS, Dec, and Inc groups.

Middle adulthood often signals greater susceptibility to major chronic health conditions. The percentage of hypertensive women in the HiS group is the largest of all the clusters. The impact of underlying heart problems have already begun to set in with this population, with approximately 12% of women with consistently high levels of

depressive symptoms reporting a doctor-diagnosed heart condition. In comparison with the other three cluster groups, this percentage is fairly high, as the percentages of those with a heart condition is less than 5% for the other three depressive symptoms groups.

Midlife is also a time of significant change in women's reproductive health, as many women begin the transition into menopause. Over 40% of the HiS women have already gone through menopause by 1993, which is a significantly larger percentage than any of the other groups. Likewise, discernible changes in functioning occur during this time. Reports of whether women suffer from any limitation were asked in 1991 and are considered here as a potential cause of later depressive symptoms. More than half of HiS women had experienced a health limitation prior to this study's analysis in 1993. This percentage is in stark contrast to those reported for the other depressive symptoms groups. Compared to the HiS cluster of women, only 16% of LoS women had experienced a prior health limitation.

Summary

In this chapter I take an exploratory approach to identifying and characterizing the patterns of depressive symptoms based on CES-D scores over an 11-year time period. In general, I found support for my first hypothesis regarding the presence of variability in depressive symptoms among this cohort of midlife women. From the series of cluster analyses, I found two stable and two dynamic patterns of varying levels of depressive symptoms, one indicating a reduction in depressive symptoms and the second registering an increase in depressive symptoms. The stable trajectories, labeled stable low depressive symptoms (LoS) and stable high depressive symptoms (HiS) are comprised of

women who consistently reported either low or high levels of depressive symptoms. In turn, one group of women reported higher CES-D scores with each interview (increasing depressive symptoms or Inc), while another group's scores appeared to decline with each wave (decreasing depressive symptoms or Dec). The initial scores of women reporting decreasing depressive symptoms were on par with those of the HiS group, but their level of symptoms ebbed over time.

Based on the bivariate associations presented in this chapter, clear differences between the stable high and stable low clusters emerged. Women consistently reporting relatively frequent depressive symptoms were disproportionately black, less likely to be married, more likely to be high school dropouts, and less likely to have had post-secondary education. Additionally, these women were less likely to be employed and among those who are employed, more likely to be in lower status jobs that they dislike. In other words, women who display opposite patterns of depressive symptoms also exhibit opposite patterns of socio-economic status. Whereas the LoS group displays clear status advantages, the HiS women are characterized by status disadvantages.

What of those whose levels of depressive symptoms change over time? Again, I identify two opposing patterns—one of increasing symptoms, one of decreasing symptoms. Given these opposite trends, it is surprising that these groups seem to share similar characteristics. Levels of educational achievement, household income, employment, health, and racial composition are virtually the same. In addition, the means and proportions of these descriptive factors almost uniformly lie between the values for the two stable groups, and they are always closer to the stable low group than to the stable high group. Because results are patterned in this way, I can identify

relatively few differences between the stable and dynamic groups. Although this series of analyses illustrates significant between-cluster differences on several important demographic, SES, and health characteristics, little information exists that can explain why some women report stable (either high or low) depressive symptoms over time while other women exhibit significant within-person variability over the years.

Interestingly enough, the average age of women in each depressive symptoms group did not vary. The fact that the depressive symptoms of this cohort of women do not vary suggests that variability in different domains of midlife play a greater role in determining the pattern of reporting for depressive symptoms over time. The relationship between age and depressive symptoms warrants additional attention.

Even though these analyses offer a dynamic view of depressive symptoms over a substantial amount of time, issues regarding censoring are still left unanswered. This chapter provides a solid platform for characterizing each group, but we still know very little about what factors influence certain women to report depressive symptoms in the first place. Reports of depressive symptoms can be the result of changes in health conditions, socioeconomic achievement processes, and major life events that occur prior to midlife. One of the first steps, however, in understanding the stable and dynamic patterns of depressive symptoms are to decipher the manner in which key covariates not only predict group membership but how they also shape within-group differences.

Chapter 4 Summary Points

- Cluster analysis yielded four primary groups: stable high depressive (HiS), stable low depressive (LoS), decreasing depressive (Dec), and increasing depressive (Inc) symptoms.
- HiS women were different from LoS women on demographic characteristics such as marital status (e.g. less likely to be married, more likely to not be married) and race (larger percentage of African Americans). HiS women were not statistically different than Dec and Inc women on demographic characteristics.
- HiS women were the most disadvantaged out of all four clusters on SES and health status measures.
- Although HiS women were, overall, more disadvantaged, the bivariate associations presented in this chapter did not provide clear distinctions as to differences between stable vs. non-stable groups.
- The average age does not differ across the four depressive symptoms groups.

Figure 4.1. Elbow Criterion to Determine the Appropriate Number of Clusters

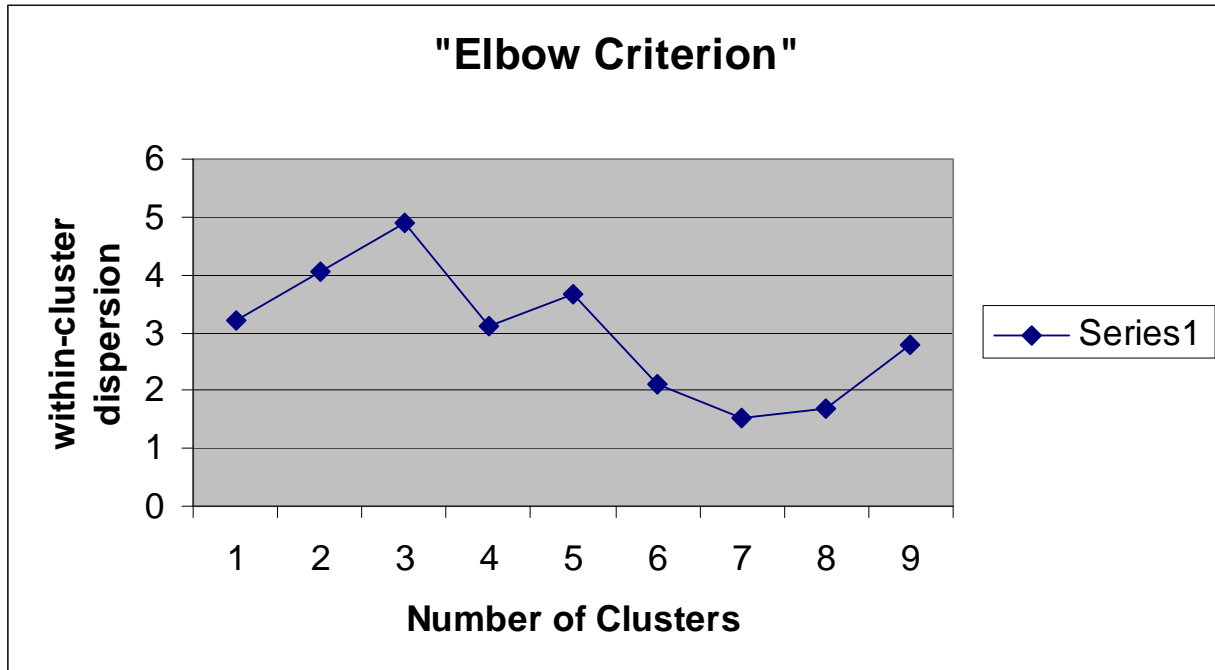


Table 4.1. Differences in Means and Percentages of Demographic Characteristics by Cluster Membership, National Longitudinal Surveys of Young Women, Unweighted, 1993.^{abc}									
			Stable High		Stable Low		Decreasing		Increasing
			(N=405)		(N=648)		(N=505)		(N=344)
Demographics Characteristics									
Age (Average in years)									
			44.40		44.29		44.29		44.12
			(3.25)		(3.08)		(3.05)		(2.99)
Race (percentage)									
			27.90%		17.90%***		19.21%**		21.80%
Marital Status									
			62.72%		73.50%***		67.79%		69.48%
			26.17%		18.64%**		23.92%		20.35%
			11.11%		7.86%		8.30%		10.17%
# of Children under 18 in the home									
			50.62%		45.92%		49.60%		52.03%
			44.69%		51.46%*		47.63%		46.22%
			4.69%		2.62%		2.77%		1.74%*

^aEach depressive group is compared to the stable high depressive symptoms group.

^b *** p < 0.001; ** p < 0.01; * p < 0.05

^c Not married includes those who stated they were either widowed, divorced, or separated in 1993.

Table 4.2. Differences in Means and Percentages of Socioeconomic and Financial Well Being by Cluster Membership, National Longitudinal Surveys, Young Women, Unweighted, 1993.^{ab}									
			Stable High		Stable Low		Decreasing		Increasing
			(N=405)		(N=648)		(N=505)		(N=344)
Socioeconomic Position									
Years of Schooling									
Less than HS			20.49%		5.86%***		10.50%***		9.59%***
High School Grad			40.99%		31.43%**		38.02%		38.66%
HS +			38.52%		62.71%***		51.68%***		51.74%***
Household Income (in \$1,000s)									
			40,455		60,527***		54,365***		53,482
			(38,181)		(44,021)		(41,091)		(39,354)
Currently Employed (percentage)									
			67.16%		89.06%***		83.17%***		82.27%***
1993 Duncan Index (avg)									
			40.14		51.88***		47.94***		45.65***

			(23.88)		(21.50)		(22.59)		(22.19)
Job Satisfaction									
	Like very much		46.15%		63.82%***		52.07%		58.78%***
	Like fairly well		42.95%		30.72%***		36.87%		36.49%
	Dislike somewhat		10.90%		4.44%***		8.29%		3.38%***
	Dislike very much		0.00%		1.02%*		2.76%***		1.35%*

^aEach depressive group is compared to the stable high depressive symptoms group.

^b*** p <0.001; ** p <0.01; *p<0.05

Table 4.3. Differences in Means and Percentages of Health Indicators by Cluster Membership, National Longitudinal Surveys, Young Women, Unweighted, 1993.^{abc}									
			Stable High		Stable Low		Decreasing		Increasing
			(N=405)		(N=648)		(N=505)		(N=344)
Health Indicators									
Perception of health compared to women of same age									
	Excellent		15.31%		58.40%***		36.96%***		33.43%***
	Good		46.42%		38.37%**		50.40%		56.69%**
	Fair		26.67%		2.93%***		10.67%***		9.30%***
	Poor		11.60%		0.31%***		1.98%***		0.58%***
Body Mass Index, 1995									
	Underweight (BMI<18.5)		12.84%		13.73%		13.07%		15.70%
	Normal (BMI 18.6-24.9)		30.37%		44.91%***		40.99%***		34.01%
	Overweight (BMI 25.0-29.9)		23.21%		26.08%		26.14%		24.13%
	Obese (BMI>30)		31.85%		14.04%***		18.61%***		23.26%**
Presence of Chronic Conditions, 1995									
	Hypertension		35.80%		12.65%***		17.03%***		22.67%***
	Heart Condition		12.35%		2.62%***		4.75%***		4.65%***
	Cancer		5.19%		3.70%		3.96%		4.36%
Gone through Menopause, 1995									
			40.99%		28.86%***		31.49%**		27.33%***
Any health limitations, 1991									
			53.83%		16.36%***		29.11%***		28.78%***

^aEach depressive symptoms group is compared to the stable high depressive symptoms group.

^b *** p < 0.001; ** p < 0.01; * p < 0.05

^c Predictor variables are examined based on the wave in which they were first implemented; the years of the initial reporting for a given predictor are indicated.

Chapter 5

Predicting Trajectories of Depressive Symptoms among Women in Midlife: The Importance of Socioeconomic Status Variables

The results from chapter 4 suggest that four main depressive symptoms trajectories emerge over an 11-year span for this cohort of midlife women: a stable, low depressive (LoS) trajectory, a stable, high depressive trajectory (HiS), a decreasing depressive trajectory (Dec), and an increasing depressive symptoms trajectory (Inc). In examining bivariate associations of cluster membership with a host of socio-demographic variables, I find distinct contrasts in group membership characteristics, particularly among women in the consistently low and consistently high depressive symptoms groups. Differences in the mean and percentages of income, educational attainment, employment status, and other noteworthy socioeconomic indicators imply a strong link between overall financial well being and reports of depressive symptoms over time.

Most studies on psychological well being refer to the literature on the connection between the SES-health gradient and life stressors at different pivotal points in people's lives. In general, SES is often viewed as affecting depressive symptoms via mediating mechanisms such as poor overall health, stressful life events, and inadequate social network systems (Bromberger et al 2004; Lynch et al 1997; McEwen 2001). Historically, women's socioeconomic status has been tied heavily to their marital status, with married women reporting a lower prevalence of depressive symptoms than unmarried women (Gazmararian et al 1995). Coupled with age, race, and various other

demographic and social factors, the link between socioeconomic status and depressive symptoms represents the complexity of women's lives throughout the life course.

My analytical strategy for this chapter is to use the SES factors described earlier in this dissertation to predict women's membership in the four diverging trajectories. Specifically, I am interested in determining how demographic factors such as age and race interact with SES to predict depressive symptoms among midlife women. Recent reports suggest statistical models encompassing a collection of both demographic and SES-related indicators (as opposed to more parsimonious models) do a much better job of explaining disparities in women's reports of depressive symptoms (Bromberger et al 2004). As previously discussed, I first evaluate in detail the characteristics of women's membership in each depressive symptoms cluster by examining within-group SES and demographic differences. Then I turn to a series of multinomial logit models to investigate the predictive nature of the independent variables.

Describing the Relationship between Socioeconomic Status Measures

Table 5.1 displays correlations among the independent variables used in the analysis. In all, the correlations are in the expected directions and are all well below 0.50, the typical acceptable cut-off value in examining for multicollinearity. Minority status is positively correlated with never married and not married, while it is inversely correlated with being married. In regards to educational achievement, being a black woman is positively related to having less than a high school diploma and negatively related to post-secondary educational attainment. For occupational-related measures,

minority status is negatively correlated with both Duncan Index scores and annual household income.

As expected, having underage children in the home is significantly related to other covariates. Minority status is negatively correlated with having no children in the home, whereas having four or more underage children in the household is positively related to being African American. Also, having underage children in the home and marital status are interrelated. Being married is positively correlated with having children in the home, while negative correlations appear among the non-married and never married. Marital status and income are interrelated, with non-married and never married exhibiting inverse associations to income.

The most important reason for presenting the correlations in table 5.1 is to establish whether the various measures of SES are highly correlated¹⁰. Higher levels of education are positively correlated with the SES-related measures of employment status, job satisfaction, Duncan Index, and income. However, aside from a modest correlation with Duncan Index (0.40), the strength of these correlations is quite low. There is very little intercorrelation involving job satisfaction and the other independent variables. Job satisfaction exhibits a weak positive correlation with employment status and post-secondary education. There are very few correlations involving age, and most of these associations are rather weak. However, age is inversely correlated with having underage children in the home and educational attainment beyond high school.

¹⁰ When analyzing the relationship between job satisfaction and Duncan Index, the sample is restricted to only those who are employed.

Bivariate Analyses of Within Trajectory Group Differences

I examine the differences between socioeconomic indicators within each trajectory by three key demographic measures—race, education, and marital status. Two-tailed t-tests for differences between means as well as chi-square tests for differences between grouped percentage distributions are presented in the preceding tables. Table 5.2 shows these differences by race within the four depressive symptoms trajectories. There are noticeable race differences within each trajectory, particularly in regards to marital status. Across all four depressive symptoms trajectories, a larger percentage of whites are married—approximately 70% or more when compared to married black women. Blacks in each trajectory are significantly more likely to be either never married or not married. Differences between black and white women in the number of underage children in the household are apparent in the LoS group only. A greater number of white women in the LoS do not have any children under the age of 18 in their household when compared to black women who report similar levels of depressive symptoms. In turn, white women are also less likely than their black counterparts to have four or more underage children in the home.

While there appears to be no difference in the percentage of black and white high school graduates, there are distinct differences across the trajectories among women with less than a high school diploma. Black women in the HiS category report a significantly higher percentage of having less than a high school diploma. About 39% of blacks in this group did not complete high school versus only 13% of white females in the same trajectory. Though no significant differences exist among women with some post-secondary education in the LoS, white women have a significantly higher percentage of

those obtaining schooling beyond high school in the other three trajectories. Over 50% of white women in both the Inc and Dec, while less than half of white women in the HiS have post-secondary education.

In general, over half of all women were employed in 1993. There are no significant differences between the percentages of those working between black and white women in the Inc and Dec; over 80% of these women are employed. However, discrepancies exist between black and white women in the LoS and HiS. Interestingly, in the stable low depressive trajectory, about 95% of blacks are working, as opposed to 88% of white women. Conversely, black women experiencing consistently high depressive symptoms over time report a lower percentage (58%) of employment than white women in the same trajectory (71%). Both black and white women in the HiS trajectory report lower percentages of working than women, regardless of race, in the other three trajectories. No distinct differences by job satisfaction are found between blacks and whites for any of the trajectories.

The race gap in financial status is further illustrated in differences in Duncan Index scores and income within each trajectory. On average, white women in all four trajectories report a higher Duncan score than blacks. Black women are also concentrated at the lower end of the income distribution in each trajectory. In the LoS, white women have an income of over \$64,000, while black women report around \$39,000. In turn, the average annual household income for white women in the HiS is approximately \$45,576. Black women in the same trajectory report a very low average of around \$27,000.

Next, I examine the differences in SES-related measures within each trajectory by the three educational categories of less than a high school education, high school graduate (reference category), and some post-secondary education (Table 5.3). When I differentiate each group by educational attainment, I find that, across all categories, there are a higher percentage of blacks who received less than a high school diploma. Surprisingly, there is no variation in marital status among women in any of the trajectories after breaking each group down by education.

The relationship between educational status and underage children in the household within each depressive symptoms trajectory is minimal. When compared to LoS high school graduates, a larger percentage of LoS women with some schooling beyond high school reported having four or more children in their home. Significant differences are also found between Dec trajectory women in these two educational categories. High school graduates are more likely to have no underage dependents when compared to more educated women. Women who continued their education beyond high school are more likely to have 1 to 3 dependents in their household in 1993.

Educational differences exist within each trajectory on important factors that can contribute to financial well being. In each trajectory, women with less than a high school diploma are significantly less likely to have job. Again, there are no stark contrasts in the percentages of women reporting job satisfaction in each of the four trajectories. However, in the LoS, women without a high school diploma are less likely than high school graduates to be satisfied with their job. Those with some post-secondary education in the Inc, on the other hand, report a lower percentage of job satisfaction.

There are vast disparities in the average Duncan Index score across all trajectories. It is also important to note the glaringly low scores of the index for women without a high school diploma. For example, for uneducated women in the HiS and Inc trajectories, the Duncan Index scores are 17.71 and 18.82, respectively. This disparity found among women with less than a high school diploma in each trajectory is evident in the differences in average income as well.

Table 5.4 shows the means and percentages of SES measures if I decompose each trajectory by marital status. A small percentage of black women represent the married population in each trajectory. In turn, blacks represent a large percentage of women who have never married in all four depressive symptoms groups as well. There are no significant differences in the percentages of educational attainment by marital status within each trajectory. However, it appears that a large percentage of women in the LoS have some schooling beyond high school, as over 60% of women in the not married, never married, and married categories report some post-secondary education.

Whether underage dependents are in the household varies by marital status within each depressive symptoms group. For the HiS group, women who were not married as well as women who had never married (as of 1993) were significantly more likely to have no children in their household. Approximately half of HiS married women reported up to three dependents, whereas only a quarter of never married women do so. A substantial percentage of LoS women report the absence of underage children, regardless of marital status. However, married women have a lower percentage of women with no dependents than both not married and never married women. 90% of never married women in the LoS group have no dependents. This pattern found in the LoS group is

more or less echoed in the two dynamic trajectories. The one exception is within the Inc. group, where differences in household composition are seen only between married and not married women. It is important to note that the breakdown of these trajectories by marital status leads to fairly small N's in cells, particularly involving the four or more underage dependent category. In fact, none of the never-married women in the LoS, Dec., and Inc. groups reported more than four children under the age of 18 in the home.

The discrepancies in SES indicators continue when each trajectory is demarcated by marital status. For women who consistently report high levels of depressive symptoms over time, only half of the never married women in this category are employed. Overall, LoS women have a high percentage of women working, regardless of marital status. Yet, there are differences in the percentages of employed women in this trajectory. Both categories of non-married women (not married and never married) have higher percentages of employment than married women in the same trajectory. As illustrated in earlier analyses, there is no variation in the percentages of women who are satisfied with their jobs. The occupational prestige of the careers of Dec. and Inc. women is practically identical when decomposed by marital status. However, differences exist among women in the HiS group. Never married women have, on average, lower Duncan Index scores (28.56) than both married women (41.52) and not married women (35.33). Married women also have a higher mean annual household income than non-married women in all four trajectories.

Multinomial Logit Analysis of Depressive Symptoms Trajectories

Table 5.5 illustrates the parameter estimates and odds ratios for the demographic-based multinomial logit model. It is important to note that I initially included both a centered¹¹ and quadratic form of the age variable. The preliminary results indicated that age squared is not significant and is therefore not considered a predictor of depressive symptoms over time. The linear form of age is also not significant. Yet, since age is a central component of my hypothesis, I include it in all of the ensuing models. Race, however, proves to be a noteworthy predictor of depressive symptoms group membership. The likelihood of black women being in both the LoS and Dec groups and not the HiS is significantly less their white counterparts.

Marital status is predictive of group membership among the two stable trajectories only. When compared to married women, non-married women are less likely to report consistently low levels of depressive symptoms than they are to report high levels of depressive symptoms over time. A further look into women's household structure reveals the importance of the presence of dependents in the home. The odds of women with four or more underage children reporting increasing depressive symptoms over time are 0.31 the odds of women without dependents reporting increasing depressive symptoms when compared to the HiS trajectory.

The inclusion of the SES explanatory variables provides further insight into women's likelihood of membership in a given trajectory (table 5.6). The pseudo-R² for this full model is higher than the previous model, therefore indicating that the addition of SES measures improves the fit of the model. The inclusion of SES provides partial

¹¹ Age is centered from its mean.

support for my hypothesis of its role as a mediator in the race-depressive symptoms relationship. Black women's likelihood of being in the HiS trajectory group as opposed to the LoS trajectory group is eliminated once I account for SES. Additionally, SES serves as a mediator in the prior marital- and household dependent-depressive symptoms association.

The variables used to measure SES exhibit strong associations with trajectory membership. Educational attainment plays a role in whether women report either consistently high or low levels of depressive symptoms over time. The odds that women who continued their education beyond high school report being in the LoS and not the HiS group are 1.51 the odds of high school graduates. In other words, additional years of schooling increases the women's likelihood of not having depressive symptoms. The significance of employment status found in the bivariate analyses carries over into these analyses. Employment is a strong predictor of membership in each trajectory. Employed women are significantly more likely than non-employed women to be in either the LoS, Dec, and Inc groups than the HiS group. This difference is especially pronounced between the LoS and HiS trajectory groups, where the odds of employed women reporting low levels of depressive symptoms is over two times as high as those of unemployed women. A similar pattern exists in regards to household income. A one unit increase in income increases the odds of being in the LoS, Dec, and Inc trajectory groups by 73%, 77%, and 84%, respectively, rather than the HiS trajectory group.

In assessing the impact of SES on the likelihood of women belonging to a specific trajectory, I initially estimated interactions involving race and two of the SES predictors—educational attainment and Duncan Index. Past research suggests that

inequalities in mental health may arise from the complex, and potentially interactive, nature of the race-SES relationship (Lorant et al, 2003; Ulbrich, Warheit, and Zimmerman 1989). The women in this study came of age during the 1960's, at a time where females experienced both an increase in labor force participation and a shift in occupational structure. Black women also began to gradually move away from the domestic service sector and continued to steadily move into more professional arenas over the next two decades (Conrad 2001). These changes may well translate into drastic changes in African-American women's physical and mental health.

The inclusion of interactions involving race and SES predictors in the multinomial logit models initially revealed a significant interaction between race and Duncan Index for the likelihood of reporting LoS versus HiS. However, comparing these logit coefficients are often problematic, since differences in residual variation may exist (Allison 1999). In order to test for unequal residual variation, I use the PROC NLIN procedure in SAS. First, I test whether all coefficients are the same for blacks and whites (table 5.7). The first column shows the parameter estimates of the variables when residual is set to 1.0. Changes in the disturbance standard deviation by race are denoted δ . Though this estimate is not significant, it provides the difference in the standard deviation of the disturbance variance for black and white women across groups. The latter half of table 5.7 provides the estimates for the model allowing the effect of Duncan Index to vary across groups. A test of the Wald chi-square for the interaction is not significant at the 0.05 level $(-0.010/0.011)^2$. Thus, I can conclude that the race by Duncan Index interaction is an artifact of residual varying degrees of residual variation between black and white women.

Summary

The primary goal of this chapter was to expand our knowledge of the characteristics of the four depressive symptoms trajectories found via cluster analysis in chapter 4. Bivariate analyses illustrating within-group differences by race, educational attainment, and marital status provided a detailed glimpse into the characteristics of each trajectory. Although these four trajectories represent distinct patterns of symptoms over time, significant variation exists within each group on a host of demographic and socioeconomic status.

Multinomial logit models assessed which variables predicted the likelihood of women's reporting a particular pattern of depressive symptoms over an 11-year span. In the initial model, race, marital status (non-married), and the number of children under the age of 18 in the home (four or more) played a role in deciphering group membership. Surprisingly, I found no support for my hypothesis regarding the importance of age in understanding the differences in depressive symptoms trajectories. Using both the centered and quadratic form, age is not a significant predictor of group membership in this study. Since this variable represents age at 1993, these results warrant a more detailed look into the actual aging process via other techniques such as growth curves.

The inclusion of SES indicators in the second model provided partial support for my second hypothesis. SES mediates the relationship between race and the likelihood of being in the LoS trajectory, as opposed to the HiS trajectory. SES also mediated both the marital status and household dependent and trajectory associations. Individually, the SES indicators were strong predictors of group membership.

Although this chapter provides additional information on the characteristics of each of the four depressive symptoms groups, we still know very little as to what differentiates those who consistently report stable depressive symptoms from those who indicate either declining or increasing depressive symptoms over time. I re-calculated the multinomial logit models using the Dec trajectory group as the reference category, in hopes of capturing any differences between those in the stable vs. non-stable groups¹². The underlying assumption is that women who are seen as improving their psychological well being potentially would exhibit different demographic and SES characteristics. However, this is not the case; models using Dec group as the reference mirrored the models presented in this chapter. Therefore, differences between the stable and dynamic trajectories are the result of other predictors not provided in this chapter.

Chapter 5 Summary Points

- Bivariate analyses of within-group differences by race, educational attainment, and marital status show significant variation in each group.
- Age is not a significant predictor of trajectory membership.
- SES mediates the relationship between race and depressive symptoms trajectory membership.
- Additionally, any effect of demographic characteristics on the trajectory membership is eliminated once SES is taken into account.
- There are no significant interactions between any of the predictor variables.

¹² These results are not included.

Table 5.1. Correlations among Independent Variables, Socioeconomic Position, National Longitudinal Surveys Young Women Cohort, 1993, Unweighted.^a

	Black	Never Married	Married	Not Married	No Kids	1 to 3 Kids	4 + Kids	Age	Less HS	HS Grad	HS +	Employed	Job Satisf.	Dun Index	Income
Black	1.00	.17***	-.25***	.16***	-0.05*	0.03	0.06**	-.05*	.25***	-.01	-.25***	-.02	.00	-.25***	-.26***
Never Married	.17***	1.00	-.47***	-.17***	0.17***	-0.17***	-0.00	-.06*	.03	-.03	-.03	-.01	-.02	-.04	-.19***
Married	-.25***	-.47***	1.00	-.79***	-0.19***	0.18***	0.04	-.00	-.06**	.02	.06**	-.04	.02	.08***	.40***
Not Married	.16***	-.17***	-.79***	1.00	0.10***	-0.08***	-0.04	.04	.05*	.00	-.05*	.05*	.01	-.06**	-.32***

No Kids	-0.05*	0.17***	-0.19***	0.10***	1.00	-0.94***	-0.17***	0.32***	0.06**	0.02	-0.06**	0.09***	-0.01	0.00	-0.09***
1 to 3 Kids	0.03	-0.17***	0.18***	-0.08***	- 0.94***	1.00	-0.17***	-0.28***	-0.09***	-0.01	0.06**	-0.04	0.02	0.02	0.09***
4 + Kids	0.06**	-0.00	0.04	-0.04	- 0.17***	-0.17***	1.00	-0.12***	0.08***	-0.05*	0.00	- 0.14***	-0.03	- 0.08***	0.00
Age	-0.05*	-0.06*	-0.00	.04	0.32***	-0.28***	-0.12***	1.00	.06***	.01	-0.06**	-0.01	-0.03	-0.03	.01
Less HS	.25***	.03	-0.06**	.05*	0.06**	-0.09***	0.08***	.06**	1.00	-.27***	-1.00***	-.20***	-.07***	-.40***	-.28***
HS Grad	-0.01	-0.03	.02	.00	0.02	-0.01	-0.05*	.01	-.27***	1.00	.27***	-0.00	.03	-.21***	-.10***
HS +	-.25***	-0.03	.06***	-.05*	-0.06**	0.06**	0.00	-0.06**	-1.00***	.27***	1.00	.20***	.07***	.40***	.28***
Employed	-0.02	-0.01	-0.04	.05*	0.09***	-0.04	-0.14***	-0.01	-.20***	.20***	-0.00	1.00	.22***	.19***	.22***

Job Satisf.	.00	-.02	.02	-.01	-0.01	0.02	-0.03	-.03	-.07***	.03	.07***	.22***	1.00	.03	.05*
Duncan Index	-.25***	-.04	.08***	-.06**	0.00***	0.02	-0.08***	-.03	-.40***	-.21***	.40***	.19***	.03	1.00	.35***
Income	-.26***	-.19***	.40***	-.32***	-0.09***	0.09***	0.00	.01	-.28***	-.10***	.28***	.22***	.05*	.35***	1.00

^a p<0.001; **p<0.01; *p<0.05

Table 5.2. Percentages and Means of Socioeconomic Position Variables by Race and Depressive Symptoms Trajectory, National Longitudinal Surveys Young Women Cohort, 1993, Unweighted.^a

	Stable High		Stable Low		Decreasing		Increasing		
	Blacks (N=113)	Whites (N=292)	Blacks (N=116)	Whites (N=532)	Blacks (N=97)	Whites (N=408)	Blacks (N=75)	Whites (N=269)	
Marital Status									
Never Married	21.24%	7.19%	15.52%	6.20%***	18.56%	5.88%***	20.00%	7.43%**	
Married	42.48%	70.55%	50.86%	78.38%***	44.33%	73.28%***	48.00%	75.46%***	
Not Married	36.28%	22.26%	33.62%	15.41%***	37.11%	20.83%***	32.00%	17.10%***	
Children under 18 in the home									
None	39.66%	47.28%	40.71%	54.45%**	46.39%	50.37%	52.00%	52.04%	
1 to 3	56.90%	50.28%	49.56%	42.81%	49.48%	47.19%	46.67%	46.10%	
4 or more	3.45%	2.44%	9.73%	2.74%***	4.12%	2.44%	1.33%	1.86%	
Education									
Less than HS	38.94%	13.36%***	12.07%	4.51%**	26.80%	6.62%***	26.67%	4.83%***	
HS Grad	34.51%	43.49%	31.03%	31.58%	39.18	37.75%	38.67%	38.66%	
HS +	26.55%	43.15%**	56.90%	63.91%	34.02%	55.64%***	34.67%	56.51%***	
Employed									
Employed	58.41%	70.55%*	94.83%	87.78%*	82.47%	83.09%	85.33%	81.41%	
Job Satisfaction									
Likes Job	32.74%	34.93%	44.83%	42.29%	38.14%	37.99%	44.00%	40.15%	
Duncan Index (avg)									
Duncan Index (avg)	25.33	43.54**	47.76	52.35*	35.22	50.05***	31.05	48.70***	
Household Income (avg)									
Household Income (avg)	27,221.58	45,576.52***	39,319.39	64,262.36***	32,969.96	59,337.53***	36,583.97	58,193.99***	

^a***p<0.001;**p<0.01;*p<0.05; significance indicators at the end of each row represent the significance between the given variable on that row.

Employed	65.06%	48.20%*	79.49%		88.73%	73.00%*	90.64%		84.90%	62.00%***	85.77%		84.96%	66.70%*	83.15%
Job Satisfaction															
Likes job	36.75%	25.30%	36.54%		43.63%	26.00%*	43.84%		39.06%	26.42%	39.62%		47.37%	45.45%	35.40%*
Duncan Index (avg)	36.26	17.71***	51.84***		42.37	26.47***	58.48***		40.87	20.83***	57.26***		40.18	18.82***	53.17***
Household Income (avg)	38,496	20,800***	52,997**		52,159	24,970***	68,036***		48,169	28,005***	64,134***		50,534	27,894**	60,429*

***p<0.001; **p<0.01; *p<0.05

^YEach education group is compared to the reference (high school graduate) category.

	Stable High			Stable Low			Decreasing			Increasing		
	Married (ref)	Not Married	Never Married	Married (ref)	Not Married	Never Married	Married (ref)	Not Married	Never Married	Married (ref)	Not Married	Never Married
	(N=254)	(N=106)	(N=45)	(N=476)	(N=121)	(N=51)	(N=342)	(N=121)	(N=42)	(N=239)	(N=70)	(N=35)
Black	18.90%	38.68%***	53.30%***	12.39%	32.20%***	35.30%***	12.57%	29.75%***	42.90%***	15.06%	34.29%***	42.86%***
Education												
Less HS	18.11%	21.70%	31.11%*	5.04%	9.09%	5.88%	10.23%	11.57%	9.52%	8.37%	14.29%	8.57%
HS Grad	42.52%	40.57%	33.33%	33.40%	25.62%	27.45%	37.72%	42.98%	26.19%	38.49%	38.57%	40.00%
HS +	39.37%	37.74%	35.56%	61.55%	65.29%	66.67%	52.05%	45.45%	64.29%	53.14%	47.14%	51.43%
Children under 18 in the home												
None	44.88%	58.49%*	64.44%*	38.66%	56.20%***	90.20%***	42.69%	61.98%***	71.43%***	48.12%	54.29%	74.29%**
1 to 3	50.39%	39.62%	24.44%**	58.61%	41.32%***	9.80%***	53.80%	37.19%**	28.57%**	49.79%	44.29%	25.71%**
4 or more	4.72%	1.89%	11.11%	2.94%	2.48%	0.00%	3.80%	0.83%	0.00%	2.09%	1.43%	0.00%

Employed	69.29%	68.87%	51.11%*	86.34%	96.69%***	96.08%*	79.82%	89.26%*	90.48%	82.43%	82.86%	80.00%
Job Satisfaction												
Likes job	33.86%	34.91%	35.56%	42.23%	44.63%	43.14%	38.30%	38.02%	35.71%	43.93%	35.71%	31.43%
Duncan Index (avg)	41.52	35.33*	28.56***	51.53	50.98	52.88	47.59	45.20	49.81	46.62	40.97	40.57
Household Income (avg)	51,961	21,433***	20,317***	69,833	34,793***	34,543***	64,884	31,941***	32,196***	63,323	31,420***	30,404***

***p<0.001; **p<0.01; p<0.05

^bEach marital group is compared to the married (reference) category.

Table 5.5. Estimates and Marginal Effects of Multinomial Logit Model of Demographic Characteristics of Depressive Symptoms Trajectories, National Longitudinal Surveys Young Women Cohort, Unweighted^a										
			Stable Low		Decreasing			Increasing		
			Parameter Estimate	Odds Ratio				Parameter Estimate	Odds Ratio	
<i>Characteristics</i>										
<i>Age</i>										
Centered			-0.01	0.99		-0.02	0.98		-0.04	0.96
			(0.02)			(0.02)			(0.03)	
<i>Race (ref. NH White)</i>										
Non-Hispanic Black			-0.47**	0.63		-0.44**	0.64		-0.24	0.79
			(0.16)			(0.17)			(0.18)	
<i>Marital (ref. Married)</i>										
Never Married			-0.32	0.73		-0.24	0.79		-0.18	0.84
			(0.23)			(0.24)			(0.26)	
Not Married			-0.39*	0.68		-0.08	0.92		-0.33	0.72

			(0.16)			(0.16)			(0.18)	
<i>Children under 18 in the home (ref. no children)</i>										
1 to 3			0.17	1.19		0.03	1.03		-0.11	0.90
			(0.14)			(0.15)			(0.16)	
4 or more			-0.51	0.60		-0.51	0.60		-1.17*	0.31
			(0.36)			(0.38)			(0.49)	
Constant			0.63***	1.88		0.37**	1.45		0.08	1.08
			(0.11)			(0.12)			(0.13)	
-2 log likelihood			5125.61							
Chi-square, (df)			38.69, (df=18)**							
Pseudo-R ²			0.007							
N			1902			1902			1902	

^a*** p <0.001; ** p <0.01; *p<0.05

Table 5.6. Estimates and Marginal Effects of Multinomial Logit Model of Demographic & SES Characteristics of Depressive Symptoms Trajectories, Full Model, National Longitudinal Surveys Young Women Cohort, Unweighted^a.										
			Stable Low		Decreasing			Increasing		
			Parameter Estimate	Odds Ratio				Parameter Estimate	Odds Ratio	
<i>Characteristics</i>										
<i>Age</i>										
Centered			0.01	1.01		-0.01	0.99		-0.03	0.97
			(0.02)			(0.02)			(0.03)	
<i>Race (ref. NH White)</i>										
Non-Hispanic Black			0.03	1.03		-0.08	0.92		0.03	1.03
			(0.19)			(0.20)			(0.22)	
<i>Marital (ref. Married)</i>										
Never Married			-0.16	0.85		-0.03	0.97		0.00	1.00
			(0.25)			(0.25)			(0.27)	
Not Married			-0.25	0.78		0.09	1.09		-0.16	0.85

		(0.18)			(0.18)			(0.20)	
<i>Children under 18 in the home (ref. no children)</i>									
1 to 3		0.22	1.25		0.08	1.08		-0.09	0.91
		(0.15)			(0.15)			(0.17)	
4 or more		0.02	1.02		-0.18	0.84		-0.92	0.40
		(0.39)			(0.39)			(0.50)	
Socioeconomic Status									
<i>Education (ref. HS Grad)</i>									
Less than HS		-0.23	0.79		-0.07	0.93		-0.37	0.69
		(0.25)			(0.23)			(0.26)	
HS +		0.41**	1.51		0.11	1.12		0.22	1.25
		(0.16)			(0.16)			(0.17)	
Employed		1.07***	2.92		0.61***	1.84		0.54**	1.72
		(0.18)			(0.17)			(0.19)	
Duncan Index, centered		0.01*	1.01		0.01	1.01		0.00	1.00
		(0.00)			(0.00)			(0.00)	

Income (log)		0.55**	1.73		0.57**	1.77		0.61**	1.84
		(0.18)			(0.18)			(0.20)	
Constant		-6.68***	0.00		-6.67***	0.00		-7.32***	0.00
		(1.97)			(2.05)			(2.24)	
-2 log likelihood		4957.42							
Chi-square, (df)		184.08, (df=36)***							
Pseudo-R ²		0.040							
N		1902			1902			1902	

^a*** p <0.001; ** p <0.01; *p<0.05

^bThis interaction is the result of differences in the disturbance variance of the race coefficient, which is illustrated in the following table.

Table 5.7. Logit Regressions Predicting Membership in HiS and LoS Trajectories for Black and White Women, Disturbance Variances Unconstrained, National Longitudinal Surveys Young Women Cohort, 1993^a							
						Duncan Index	
			All Coefficients Equal			Coefficient Unconstrained	
Variable			Coefficient	SE		Coefficient	SE
Intercept			5.293**	2.017		5.753**	2.133
Age			-0.003	0.021		-0.005	0.022
Black			0.257	0.144		0.153	0.198
Not Married			0.186	0.162		0.228	0.178
Never Married			0.028	0.219		0.025	0.245
1 to 3 Children			-0.267	0.140		-0.288	0.150
4 + Children			-0.1078	0.339		-0.144	0.378
Less HS			0.254	0.213		0.269	0.235
HS +			-0.334*	0.146		-0.366*	0.155
Employed			-0.989***	0.175		-1.032***	0.190

Duncan Index			-0.011***	0.003		-0.008*	0.004
Income			-0.417**	0.163		-0.445**	0.171
δ			0.542	0.291		0.243	0.349
Race x Duncan Index						-0.010	0.011
Log likelihood			-616.34			-615.76	

*** p < 0.001; ** p < 0.01; *p < 0.05 (Wald chi-square)

Chapter 6

The Effects of Physical Health Conditions on Women's Depressive Symptoms Trajectories

In this chapter, I continue to assess differential membership in the four calculated depressive symptoms trajectories by incorporating physical health predictors. Physical health can affect whether or not a woman becomes or remains, depressed. The presence of major chronic diseases, such as hypertension and heart disease, can add physical, psychological, and financial burden during a demanding time in women's lives. Coupled with the compounded familial and career responsibilities so characteristic of midlife, the impact of additional health ailments can take a tremendous toll on women's psychological well being.

Literature on health outcomes tends to follow two prominent lines of research. One segment of this research focuses on social conditions as the fundamental cause of diseases. This theory contends that factors such as SES and social support, unlike individual-level risk factors, signify access to valuable resources and play a crucial role in affecting multiple health outcomes through various mechanisms (Link and Phelan 1995; 1996; 2000). While this line of research emphasizes the importance of social conditions on health outcomes, other health-based literature tends to focus on the impact of comorbidity on health (Markman 2008; Schellevis et al 1993; van de Akker et al 1998). The presence of two or more health problems can have a cascading effect, where existing conditions ultimately lead to additional health problems.

Whereas chapter 5 addressed differences in trajectory membership by traditional fundamental social causes of depressive symptoms, this chapter tackles differences in trajectory membership based on various health issues. The analyses in this chapter mirror that of chapter 5, where I first examine the within-trajectory differences of demographic characteristics and indicators of socio-economic status by race. Next, I run an analogous series of multinomial logit models to predict trajectory membership. Lastly, I combine both SES and health predictors to assess the combined effects of these indicators on trajectory membership.

Bivariate Analysis of Within-Trajectory Group Differences by Race

Table 6.1 shows the percentage of key health conditions by race within each depressive symptoms trajectory. Significant differences in the percentages of hypertensive women exist within each group. Black women report a significantly higher percentage of physician-diagnosed hypertension within each depressive symptoms trajectory than their white counterparts. In the HiS group, more than 50% of blacks report that they have hypertension, making this group the most hypertensive women in the sample by far. These differences are in stark contrast to those of cancer and heart problems, which yielded no distinct differences in the percentages within each trajectory. There are no black women in the LoS group who have had a diagnosed heart disease. The absence of significant group differences in the proportion of women reporting cancer and heart conditions likely reflects the small number of reported diagnoses, particularly for cancer, throughout the entire sample.

Significant race differences exist within each trajectory for those reporting normal weight. Approximately half of white women in the LoS trajectory group are of normal weight. This differs dramatically from blacks within the same category, with only 19% of black women reporting body weight within the normal BMI range. In all, a larger percentage of white women report normal body weight within each trajectory. Moreover, there is little variation in reports of being overweight between blacks and whites within all trajectories except for LoS. About 37% of black women are overweight in the LoS group as compared to 23% of white women within the same group. Although there are significant differences in the percentages of black and white overweight women in the LoS group only, much of the within-group differences in obesity levels are found in the HiS, Dec., and Inc. trajectory groups. Again, the percentage of black women reporting obesity in these three trajectories is significantly larger than among white women within the same trajectories.

Past research on depression among midlife women often linked changes in psychological well being to the menopausal transition. Table 6.1 illustrates the within-group percentages of women who have already experienced, or were currently experiencing, menopause as of 1995. In each of the depressive symptoms trajectories, there were no apparent race differences in the percentages of women reporting menopause. These non-significant findings could possibly be a reflection of the cross-sectional nature of the menopause question. Recent reports suggest that race differences exist in the *timing* of menopausal transition (Henderson et al 2008).

Differences in self-rated health, which is measured on a four-point scale, are evident between black and white women. Disparities between the percentages of black

and white women reporting excellent health exist among all trajectories. White women report higher percentages of excellent health in each depressive symptoms trajectory. In the LoS group, 62% of whites are in excellent health versus 39% of blacks. Among women who report consistently high depressive symptoms, a fairly low proportion of both black (5%) and white (19%) women view their overall health as excellent. Black women report a higher percentage of good health than white women in the LoS and Inc groups. There is a significant difference between those reporting fair health within the Dec.group, where 19% of black women and 8% of white women view their health as fair, when compared to women of the same age. Higher percentages of poor health can be found in the HiS group; 20% of blacks feel that their overall health is poor. With the exception of the HiS group, the number of women in the entire sample reporting poor health is low. For example, none of the black women in the LoS group reported poor health.

Additionally, I examined whether there were race differences in physical limitations. As described in the methods chapter, women were asked if they were suffering from any health limitations by the 1991 wave. There were no significant differences in the race-specific number of reported health limitations within any of the trajectories in this sample of midlife women. However, it is interesting to note that close to 50% of blacks and over half of whites in the HiS group had at least some form of health limitation prior to the initial round of depressive symptoms questions in 1993.

In order to capture the potential severity of women's health problems, I constructed a count variable indicating the number of possible health problems women had experienced. Responses were based on whether a woman reported having none, one,

or two or more of the following health problems: hypertension, heart disease, cancer, obesity, and functional limitations. Table 6.1 shows that a smaller percentage of black women than white women in the LoS, Dec., and Inc. groups experience none of the aforementioned health issues. In turn, a significantly larger percentage of black women in the HiS, Dec., and Inc. groups report two or more health problems.

Multinomial Logit Analyses of Health Conditions

Tables 6.2 and 6.3 present the results of the multinomial logit models assessed with the independent health-related measures. The first model, reported in table 6.2, specifies demographic variables and health problems on the right-hand side of the equation¹³. Similar to chapter 5 results, age is not a significant net predictor of trajectory membership. Race also becomes a non-issue when health indicators are taken into account, suggesting that the race disparity I identified is mediated through race-differences in health conditions. However, marital status and the number of underage dependents play significant roles in determining patterns of depressive symptoms reporting over time once health differences are controlled. When compared to married women, non-married women are less likely to report either stable low or increasing depressive symptoms than women who consistently report relatively high levels of depressive symptoms. Also, women with four or more children under the age of 18 who

¹³ Models assessing the health problems independently were computed initially to compare the fit to the model in table 6.2 I also ran all of the multinomial logit models displayed in this chapter with the severity (number of conditions) variable presented in table 6.1. This variable was not statistically significant and is therefore not shown in these analyses.

still live at home are significantly less likely to be in the Inc. group than the HiS group when compared to women without underage dependents.

The presence of chronic health conditions reflects the differences in the likelihood of belonging to a given trajectory group. Hypertension and heart disease appear to be of greater concern to women who consistently report depressive symptoms. Women who have been diagnosed with hypertension or a heart condition are less likely to report stable low, decreasing, or increasing depressive symptoms over time than those who do not suffer from either ailment. Cancer, on the other hand, does not appear to be a factor in determining trajectory membership, perhaps because it is a relatively rare event for these women during this period of time.

Obesity serves as a significant indicator of trajectory membership as well. In this model, obesity is indicative of sustained bouts of depressive symptoms during midlife when compared to LoS and Dec. symptoms paths. Women reporting both menopause and physical limitations are also less likely to report low, decreasing, and increasing symptoms over time than those who have yet to experience menopause and physically limiting ailments.

The addition of self-rated health to the first multinomial logit model (table 6.3) provides insight into not only diagnosed physical health conditions but also into how women assess their own health in comparison to others within the same age group. Several significant relationships established in the initial model are altered once I account for subjective ratings of individual health, suggesting that these relationships are mediated through differences in self-assessed health. For instance, there is no longer a distinction between non-married and married women in the likelihood of belonging to

either the HiS group or the Inc. group. Likewise, hypertensive women are no longer less likely than non-hypertensive women to be in the Inc group than the HiS group. Women who have had heart problems are still less likely to belong in the LoS group than the HiS group. However, there is no longer a significant difference between the likelihood of women who have had heart conditions reporting either of the two fluctuating trajectories versus the stable high trajectory. Furthermore, the inclusion of self-reported health channels the impact of body weight. Obesity is no longer a net predictor of depressive symptoms over time.

Moreover, positive self-ratings of health appear to be overwhelmingly strong predictors of group membership. Women reporting excellent health are much more likely to belong in either the LoS, Dec., or Inc. groups. For example, women in excellent health are 57 times as likely as women in poor health to report consistently low levels of depressive symptoms over time. Similarly the odds that women in excellent health belong to the Inc group when compared to the HiS group are about 28 times the odds of women reporting poor self-ratings of health. This pattern continues, albeit at a smaller magnitude, when assessing those who are in good health versus those who are in poor health. As with the multinomial logit models in the last chapter, tests for possible interactions between race and all of the health conditions were conducted. However, none of these interactions were significant.

In order to assess possible differences in predictors of stable versus dynamic trajectories, I also ran a full model similar to the previous one (table 6.3), using the declining trajectory as the reference category. Table 6.4 shows that, overall, there are no

significant distinguishing predictors in these models that account for the fluctuating depressive symptoms patterns we see in the Dec. and Inc. groups.

Full Model: SES and Health-Related Predictors

This chapter, along with chapter 5, has utilized multinomial logit analyses to decipher the importance of SES and health-related indicators on trajectory membership. Table 6.5 displays the combined effect of these two sets of indicators on the likelihood of belonging to a given trajectory. Not being married at the first wave continues to be a significant predictor of trajectory membership. When compared to married women, these women are notably less likely to report consistently low levels of depressive symptoms over time. Having several underage children demarcates women in the HiS trajectory from those in the Inc trajectory. Women with four or more underage children in the home are less likely than women without children to exhibit increasing levels of depressive symptoms than those in the reference category.

Socio-economic status proves to be a salient predictor of depressive symptoms over time. Employed women are more likely to be in the LoS trajectory than in the HiS trajectory. Among those who are working, women with more prestigious occupations are typically representative of the LoS trajectory, when compared to HiS women. Differences in income, however, are concentrated between those in the HiS trajectory and women in the two fluctuating trajectories, with a greater likelihood of more financially stable women belonging to the Dec. and Inc. trajectories. Perhaps one of the most interesting findings is the lack of an education effect on trajectory membership once health variables are controlled. Based on this model, employment and economic factors,

and not education, are directly influential in determining depressive symptoms patterns over time, whereas the influence of education appears to be mediated through differences in health indicators.

Health problems persist in this full model, with hypertension and heart disease playing an integral role in predicting trajectory membership. Compared to non-hypertensive women, hypertensive women are less likely to be included into the LoS and Dec. trajectories than in the HiS trajectory. Heart disease sufferers also are less likely than non-sufferers to report consistently low levels of depressive symptoms. Women who have experienced menopause by 1995 were less likely to report increasing depressive symptoms. As shown earlier, the signs of physical limitations among this cohort of midlife women are mostly indicators of consistently high levels of depressive symptoms over time. Likewise, positive reports of self-rated health remain a strong predictor of trajectory membership and of high levels of depressive symptoms through midlife. Both cancer diagnosis and BMI fail to predict trajectory membership when both SES and health-related issues are considered.

Summary

Overall, this chapter presents the key health-related measures that affect the likelihood of women being in particular trajectories of depressive symptoms. This chapter also addresses my hypothesis regarding the importance of self-rated health in predicting depressive symptoms trajectory membership. When compared to women reporting poor health, those reporting either excellent, good, or even fair health are much more likely to be in all other trajectories than in the HiS trajectory. This finding mirrors other research highlighting the negative association between self-rated health and mental

health outcomes (Leibson et al 1999; Tessler and Mechanic 1978; Ormel et al 1998).

This relationship is often independent of other factors such as chronic conditions and physician visits (Leibson et al 1999; Schneider et al 1994).

Again, race and age were not significant predictors of group membership when health factors were taken into account. The bivariate analysis of within-group differences by race indicated, however, that significant variability exists within each group. These findings suggest that both distal factors of health outcomes, as seen in the previous chapter, and more proximate, individual-level factors contribute to women's depressive symptoms over time, and that these differences reflect compositional differences between women of different races. The incorporation of both the socio-economic status measures and the health conditions provided a more comprehensive view of each trajectory, yet similar models using a different reference category did not provide any additional information on what factors differentiate the more stable patterns from the fluctuating patterns.

Chapter 6 Summary Points

- Although within-group differences by race were found in abundance, race is not a significant predictor of group membership once health-related measures are taken into account.
- Age remains a non-issue in predicting depressive symptoms over time.
- Self-ratings of health are strong predictors of depressive symptoms trajectories, net of demographic factors.
- A model including both SES and health-related predictors shows that both sets of indicators are crucial to understanding patterns of depressive symptoms reporting.
- These analyses, however, do little in the way of distinguishing the differences leading to dynamic reports of depressive symptoms versus more stable reports of depressive symptoms

Table 6.1. Percentages of Health Variables by Race and Depressive Symptoms Trajectory, National Longitudinal Surveys Young Women Cohort, Unweighted^{ab}.

		Stable High		Stable Low		Decreasing		Increasing	
		Blacks (N=113)	Whites (N=292)	Blacks (N=116)	Whites (N=532)	Blacks (N=97)	Whites (N=408)	Blacks (N=75)	Whites (N=269)
Diagnosed Chronic Conditions, 1995									
Hypertension		51.33%	29.79%***	22.41%	10.53%***	26.80%	14.71%**	38.67%	18.22%***
Heart Disease		14.16%	11.64%	0.00%	3.20%	5.15%	4.66%	5.33%	4.46%
Cancer		1.77%	6.51%	1.72%	4.14%	3.09%	4.17%	1.33%	5.20%
Body Mass Index, 1995									
Underweight		10.62%	13.70%	23.28%	11.65%***	10.31%	13.73%	10.67%	17.10%
Normal Weight		19.47%	34.59%**	18.97%	50.38%***	21.65%	45.34%***	21.33%	37.55%**
Overweight		23.01%	23.29%	37.07%	23.68%**	28.87%	25.49%	26.67%	23.42%
Obese		45.13%	26.71%***	18.97%	12.97%	36.08%	14.46%***	37.33%	19.33%***
Reproductive, 1995									
Menopause		39.82%	41.44%	35.34%	27.44%	36.08%	30.39%	28.00%	27.14%
Self-Rated Health, 1993									
Excellent		5.31%	19.18%***	39.66%	62.41%***	25.77%	39.71%**	21.33%	36.80%**
Good		43.36%	47.60%	56.03%	34.59%***	52.58%	49.75%	66.67%	53.90%*
Fair		30.97%	25.00%	4.31%	2.63%	19.59%	8.58%**	10.67%	8.92%
Poor		20.35%	8.22%***	0.00%	0.38%	2.06%	1.96%	1.33%	0.37%

Physical Limitations, 1991									
Any Limitations		48.67%	55.82%	16.38%	16.35%	28.87%	29.17%	26.67%	29.37%
Count of Possible Conditions ^b									
None		16.81%	24.32%	51.72%	63.35%*	36.08%	51.47%**	30.67%	46.47%*
One		33.63%	38.01%	37.93%	27.44%*	35.05%	33.33%	36.00%	34.94%
2 or More		49.56%	37.67%*	10.34%	9.21%	28.87%	15.20%**	33.33%	18.59%**

^a*** p<0.001; **p<0.01; *p<0.05

^bCount variable consists of positive responses to hypertension, heart disease, cancer, obesity, and any functional limitations.

Table 6.2. Multinomial Logit Analysis of Demographic and Health-Related Indicators, National Longitudinal Surveys Young Women Cohort, Unweighted^{ab}.									
		Stable Low		Decreasing		Increasing			
		Parameter Estimate	Odds Ratio	Parameter Estimate	Odds Ratio	Parameter Estimate	Odds Ratio	Parameter Estimate	Odds Ratio
<i>Characteristics</i>									
<i>Age</i>									
Centered		0.04	1.04	0.02	1.02	-0.00	1.00		
		(0.02)		(0.02)		(0.03)			
<i>Race (ref. NH White)</i>									
Non-Hispanic Black		-0.21	0.81	-0.24	0.78	-0.12	0.89		
		(0.18)		(0.18)		(0.19)			
<i>Marital (ref. Married)</i>									
Never Married		-0.22	0.81	-0.17	0.84	-0.15	0.86		
		(0.25)		(0.25)		(0.26)			
Not Married		-0.44**	0.64	-0.13	0.88	-0.37*	0.69		
		(0.17)		(0.17)		(0.19)			
<i>Children under 18 in the home (ref. no children)</i>									
1 to 3		0.05	1.06	-0.04	0.96	-0.17	0.85		
		(0.15)		(0.15)		(0.17)			
4 or more		-0.43	0.65	-0.44	0.64	-1.13*	0.33		
		(0.39)		(0.40)		(0.50)			
<i>Health Problems</i>									
Hypertension		-0.96***	0.38	-0.72***	0.49	-0.42*	0.66		
		(0.18)		(0.17)		(0.18)			

Heart Disease		-1.21***	0.30		-0.73**	0.48		-0.79*	0.45
		(0.31)			(0.27)			(0.31)	
Cancer		-0.19	0.83		-0.22	0.80		-0.05	0.95
		(0.33)			(0.33)			(0.36)	
<i>BMI (ref. normal weight)</i>									
Underweight		-0.09	0.91		-0.11	0.90		0.16	1.18
		(0.22)			(0.22)			(0.24)	
Overweight		-0.01	0.99		0.04	1.04		0.06	1.06
		(0.18)			(0.18)			(0.21)	
obese		-0.70***	0.50		-0.44*	0.64		-0.17	0.84
		(0.19)			(0.19)			(0.21)	
Menopause		-0.38*	0.69		-0.32*	0.73		-0.54**	0.58
		(0.15)			(0.15)			(0.17)	
Any Limitations		-1.60***	0.20		-0.91***	0.40		-0.93***	0.39
		(0.15)			(0.14)			(0.16)	
Constant		1.76***	5.81		1.21***	3.35		0.84***	2.32
		(0.17)			(0.17)			(0.19)	
-2 log likelihood		4862.98							
Chi-square, (df)		254.83, (df=42)***							
Pseudo-R²		0.058							
N		1902			1902			1902	

^areference group is HiS

^b***p<0.001; **p<0.01; *p<0.05

Table 6.3. Multinomial Logit Analysis of Demographic, Health-Related Indicators, and Self-Rated Health, National Longitudinal Surveys Young Women Cohort, Unweighted^{ab}.									
		Stable Low		Decreasing		Increasing			
		Parameter Estimate	Odds Ratio	Parameter Estimate	Odds Ratio	Parameter Estimate	Odds Ratio		
<i>Characteristics</i>									
<i>Age</i>									
Centered		0.03	1.03	0.01	1.01	-0.01	0.99		
		(0.03)		(0.03)		(0.03)			
<i>Race (ref. NH White)</i>									
Non-Hispanic Black		0.11	1.12	-0.09	0.92	0.05	1.05		
		(0.19)		(0.18)		(0.20)			
<i>Marital (ref. Married)</i>									
Never Married		-0.26	0.77	-0.17	0.84	-0.14	0.87		
		(0.27)		(0.26)		(0.27)			
Not Married									
		-0.46*	0.63	-0.13	0.88	-0.36	0.70		
		(0.18)		(0.17)		(0.20)			
<i>Children under 18 in the home (ref. no children)</i>									
1 to 3		0.02	1.03	-0.06	0.94	-0.20	0.82		
		(0.16)		(0.16)		(0.17)			
4 or more									
		-0.53	0.59	-0.51	0.60	-1.18*	0.31		
		(0.42)		(0.40)		(0.51)			
<i>Health Problems</i>									
Hypertension		-0.78***	0.46	-0.62***	0.54	-0.31	0.73		
		(0.19)		(0.18)		(0.19)			
Heart Disease									
		-0.93**	0.40	-0.54	0.58	-0.53	0.59		

		(0.33)			(0.28)			(0.32)	
Cancer		0.12	1.12		-0.06	0.95		0.16	1.17
		(0.36)			(0.34)			(0.38)	
<i>BMI (ref. normal weight)</i>									
Underweight		0.17	1.19		0.05	1.05		0.32	1.38
		(0.23)			(0.23)			(0.25)	
Overweight		0.22	1.24		0.17	1.19		0.19	1.21
		(0.19)			(0.19)			(0.21)	
obese		-0.18	0.84		-0.15	0.86		0.14	1.15
		(0.21)			(0.20)			(0.22)	
Menopause		-0.33*	0.72		-0.30*	0.74		-0.52**	0.59
		(0.16)			(0.15)			(0.17)	
Any Limitations		-1.18***	0.31		-0.66***	0.51		-0.65***	0.52
		(0.16)			(0.15)			(0.17)	
<i>Self-Rated Health (ref. Poor)</i>									
Excellent		4.05***	57.52		1.99***	7.35		3.33***	27.99
		(0.75)			(0.40)			(0.75)	
Good		2.72***	15.21		1.36***	3.88		2.84***	17.07
		(0.74)			(0.38)			(0.74)	
Fair		1.10	3.01		0.64	1.90		1.79*	5.98
		(0.78)			(0.40)			(0.76)	
Constant		-1.66*	0.19		-0.41	0.66		-2.19**	0.11
		(0.76)			(0.41)			(0.76)	

-2 log likelihood		4661.07							
Chi-square, (df)		366.50, (df=51)***							
Pseudo-R ²		0.097							
N		1902			1902			1902	

^areference group is HiS

^b***p<0.001; **p<0.01; *p<0.05

Table 6.4. Multinomial Logit Analysis of Demographic, Health-Related Indicators, and Self Rated Health Using Declining Trajectory as the Reference Category, National Longitudinal Surveys Young Women Cohort, Unweighted^a											
			Stable Low		Stable High			Increasing			
			Parameter Estimate	Odds Ratio				Parameter Estimate	Odds Ratio		
<i>Characteristics</i>											
<i>Age</i>											
Centered			0.01	1.01				-0.01	0.99		
			(0.02)					(0.03)		(0.03)	
<i>Race (ref. NH White)</i>											
Non-Hispanic Black			0.20	1.22				0.09	1.09		
			(0.17)					(0.18)		(0.19)	
<i>Marital (ref. Married)</i>											
Not Married			-0.33*	0.72				0.13	1.14		
			(0.15)					(0.17)		(0.18)	
<i>Health Problems</i>											
Hypertension			-0.16	0.85				0.62***	1.86		
			(0.18)					(0.18)		(0.19)	
Menopause			-0.03	0.97				0.30*	1.35		
			(0.14)					(0.15)		(0.16)	
Any Limitations			-0.51***	0.60				0.66***	1.94		
			(0.15)					(0.15)		(0.16)	
<i>Self-Rated Health (ref. Poor)</i>											
Excellent			2.05**	7.77				-1.99***	0.14		
			(0.79)					(0.40)		(0.79)	
Good			1.37	3.94				-1.36***	0.26		
										1.48 4.39	

		(0.79)			(0.38)			(0.79)	
Constant		-1.25	0.29		0.41	1.51		-1.78*	0.17
		(0.79)			(0.41)			(0.80)	
-2 log likelihood		4661.07							
Chi-square, (df)		366.50, (df=51)***							
Pseudo-R ²		0.097							
N		1902			1902			1902	

***p<0.001; **p<0.01; *p<0.05

Table 6.5. Full Model: Multinomial Logit Analysis of Demographic, SES, and Health Indicators National Longitudinal Surveys Young Women Cohort, Unweighted^{ab}.									
		Stable Low		Decreasing		Increasing			
		Parameter Estimate	Odds Ratio	Parameter Estimate	Odds Ratio	Parameter Estimate	Odds Ratio	Parameter Estimate	Odds Ratio
<i>Characteristics, 1993</i>									
Age, Centered		0.03	1.03	0.02	1.02	-0.01	0.99		
		(0.03)		(0.03)		(0.03)			
<i>Race (ref. NH White)</i>									
Non-Hispanic Black		0.27	1.31	0.03	1.03	0.16	1.17		
		(0.20)		(0.19)		(0.21)			
<i>Marital (ref. Married)</i>									
Never Married		-0.21	0.81	-0.03	0.97	-0.01	0.99		
		(0.28)		(0.27)		(0.28)			
Not Married									
		-0.40*	0.67	0.00	1.00	-0.22	0.80		
		(0.20)		(0.19)		(0.21)			
<i>Children under 18 in the home (ref. no children)</i>									
1 to 3		0.05	1.05	-0.04	0.96	-0.20	0.82		
		(0.16)		(0.16)		(0.17)			
4 or more									
		-0.24	0.79	-0.38	0.69	-1.15*	0.32		
		(0.43)		(0.41)		(0.52)			
<i>Socio-economic Status, 1993</i>									
<i>Education (ref. HS Grad)</i>									
Less than HS		-0.09	0.92	0.05	1.05	-0.21	0.81		
		(0.27)		(0.24)		(0.27)			
HS +									
		0.25	1.29	0.01	1.01	0.11	1.12		
		(0.17)		(0.17)		(0.18)			

Employed	0.62**	1.86		0.25	1.29		0.12	1.13
	(0.21)			(0.19)			(0.21)	
Duncan Index, Centered	0.01*	1.01		0.01	1.01		-0.00	1.00
	(0.00)			(0.00)			(0.00)	
Income, (log)	0.25	1.28		0.38*	1.46		0.41*	1.51
	(0.20)			(0.20)			(0.22)	
<i>Health Problems</i>								
Hypertension	-0.77***	0.46		-0.62***	0.54		-0.30	0.74
	(0.19)			(0.18)			(0.19)	
Heart Disease	-0.93**	0.40		-0.54	0.58		-0.53	0.59
	(0.34)			(0.28)			(0.33)	
Cancer	0.11	1.12		-0.07	0.93		0.13	1.14
	(0.36)			(0.35)			(0.38)	
<i>BMI (ref. normal weight)</i>								
Underweight	0.20	1.22		0.06	1.06		0.34	1.41
	(0.23)			(0.23)			(0.25)	
Overweight	0.22	1.25		0.17	1.18		0.20	1.22
	(0.19)			(0.19)			(0.21)	
obese	-0.12	0.89		-0.12	0.89		0.16	1.17
	(0.21)			(0.20)			(0.22)	
Menopause	-0.30	0.74		-0.29	0.75		-0.52**	0.59
	(0.16)			(0.16)			(0.17)	
Any Limitations	-1.18***	0.31		-0.64***	0.53		-0.63***	0.53
	(0.17)			(0.15)			(0.17)	

<i>Self-Rated Health (ref. Poor)</i>									
Excellent		3.42***	30.44		1.64***	5.14		3.05***	21.20
		(0.77)			(0.42)			(0.77)	
Good		2.19**	8.94		1.06**	2.89		2.60***	13.51
		(0.76)			(0.40)			(0.75)	
Fair		0.78	2.18		0.46	1.59		1.67*	5.32
		(0.79)			(0.42)			(0.77)	
Constant		-4.65*	0.01		-4.68*	0.01		-6.80**	0.00
		(2.33)			(2.23)			(2.51)	
-2 log likelihood		4618.26							
Chi-square, (df)		388.77 (df=66)***							
Pseudo-R ²		0.106							
N		1902			1902			1902	

^areference group is HiS

^b***p<0.001; **p<0.01; *p<0.05

Chapter 7

Conclusion and Future Directions

Until very recently, research on middle adulthood could best be described as uncharted territory in the social sciences (Lachman 2004; Wahl & Kruse 2005), as studies focusing on women's lives in emerging adulthood and old age dominated sociological and human development research agendas. However, the substantial gains in average life expectancy, the aging of the Baby Boom cohorts, as well as the increasing popularity of integrating life course and life span perspectives into health research have all contributed to the recent surge of interest in the complexities comprising midlife.

The heterogeneity that is so characteristic among individuals in midlife is particularly pronounced among women. Studying women's health in midlife requires an in-depth look into the multiple roles and role transitions women experience. Career and family responsibilities are often at an all-time high during this time period, which can potentially lead to stress-related health conditions. The complexity surrounding women's lives therefore can shape how they view both their physical and mental well being.

Drawing upon six waves of empirical data, this study attempts to uncover the important factors contributing to disparities in depressive symptoms among women throughout midlife. Specifically, this study merges prior knowledge of socio-demographic and health-related risk factors for women's depression in order to identify common depressive symptoms trajectories in a population-based sample of midlife women. Using a series of k-means cluster analyses, I first identify distinct depressive

symptoms trajectories based on CES-D scores from each wave. From there, I use bivariate analyses to describe each trajectory. I also utilize bivariate analysis to examine within-trajectory differences based on key socioeconomic and demographic factors. Next, I conducted a series of multinomial logit models that analyzed the importance of socioeconomic status and health-related characteristics, both individually and combined, as significant predictors of trajectory membership. Of particular importance in this study were the possible race and age differences in the reporting of depressive symptoms. The NLS-YW cohort is an excellent source for addressing potential health disparities. The NLS-YW is one of the only longitudinal datasets that include a host of questions regarding the financial, occupational, familial, and health history of a population-based sample of black and white American women.

The first hypothesis of this study stated that the depressive symptoms trajectories found in this sample would be indicative of the variability characteristic of middle adulthood. As stated earlier, I tested this hypothesis in chapter 4 by conducting a k-means cluster analysis to identify and differentiate viable depressive symptoms trajectories, as defined by the log transformation of the CES-D short-item form for each wave between 1993 and 2003. Once coherent patterns of depressive symptoms were established, I examined the socio-demographic and health characteristics of each trajectory.

Results from these analyses show that four distinct depressive symptoms trajectories emerged over this 11-year time frame. Supporting the prior hypothesis, these four patterns of depressive symptoms represent, in a sense, the heterogeneity of psychological well being in midlife. The first cluster, the stable low trajectory (LoS),

described women who report a consistently low score on the CES-D scale, thus indicating little to no problems in regards to depressive symptoms over this eleven-year window. In contrast, the second trajectory, stable high (HiS), represented women who repeatedly report high CES-D scores in each survey year. Their accounts of symptoms are not only 'high' relative to what other women in the sample were reporting; they are also high enough to suggest that these women are bordering on, or managing to remain just below, a combination of behaviors and feelings that are consistent with a diagnoses of clinical depression (Solomon et al 2001). The responses of all women, however, are not concentrated at the extreme ends of the scale. For instance, one group, labeled as the decreasing depressive symptoms trajectory (Dec), are characterized by a gradual reduction in CES-D scores from 1993 until 2001, and a leveling off of scores that occurs between 2001 and 2003. The final group, the increasing depressive symptoms trajectory, or Inc., were characterized by steadily increasing CES-D scores until 2001, with a plateau or slight decline occurring in 2003.

A more detailed analysis of each trajectory group's characteristics revealed interesting contrasts, especially between women in the HiS and LoS trajectories. A larger percentage of women in the HiS trajectory were black, not married, and had a prior hypertension and heart condition diagnosis. This same group of women, in turn, had the lowest percentage of married women, those with post-secondary education, and those who were employed. By all accounts, the women of the LoS trajectory were polar opposites of those in the HiS trajectory. Women with consistently low levels of depressive symptoms, on average, had the highest annual household income and Duncan Index scores, and they reported higher percentages of women who were married,

employed, and have some post-secondary schooling. These women also reported the lowest percentages of any trajectory in hypertension, heart, and obesity rates.

In chapter 5, I turn to an in-depth analysis of the relationship between SES measures and trajectory membership. The first set of analyses in this chapter illustrated the within-trajectory variation based upon race, educational and marital status differences. Black women, on average, had a lower annual household income as well as lower Duncan Index scores than white women within the same trajectory. Distinct patterns emerged between black and white women within the LoS trajectory, as black women are significantly more likely to be employed than their white counterparts. However, the employment advantage of blacks was eliminated in the HiS trajectory, where a significantly larger percentage of white women were working. For black women who have had historically high percentages of labor force participation, the possible absence of paid employment could have led to the high levels of depressive symptoms documented among those in the HiS trajectory; however, we cannot discount the possibility that experiencing depressive symptoms is not conducive to stable employment. Untangling the non-recursive effects of health and employment continues to challenge social science researchers.

Employment status remained an important factor in distinguishing within-trajectory differences when considering educational and marital differences. Women with less than a high school diploma were less likely to be employed when compared to high school graduates within the same trajectory. Marital status differences in employment are evident within both the HiS and LoS trajectories. Only half of all non-married women in the HiS trajectory are employed when compared to their married

counterparts. In the LoS trajectory, however, married women had a lower percentage of employment than both non-married and never-married women. Blacks, women without a high school diploma, non- and never-married women reported, on average, less household income and lower occupational prestige than whites, women with at least a high school diploma, and married women within each trajectory.

In my second hypothesis I argued that differences in depressive symptoms trajectories vary by race, with blacks more likely to report less favorable patterns of depressive symptoms. I find some support for this hypothesis in chapters 4 and 5. The bivariate analyses conducted in chapter 4 revealed that the HiS trajectory group has a larger percentage of black women when compared to the LoS and Dec. There were no statistical difference between the HiS and Inc trajectories, suggesting that there was a greater tendency for black women to report either consistently high levels of depressive symptoms or a steadily increasing level of depressive symptoms over time. Additionally, bivariate analyses of race differences within trajectories (chapter 5) showed that that black women within each trajectory exhibit less favorable characteristics. For example, a lower percentage of black women in each trajectory are married and a higher percentage of black women have never married, when compared to their white counterparts. Also, a larger percentage of black women in each trajectory held less than a high school education. The analysis of the basic multinomial logit model including only demographic characteristics in chapter 5 shows that black women are less likely to be in the LoS or Dec. trajectory groups than the HiS trajectory group.

The aforementioned race differences in the likelihood of being in a given trajectory are eliminated with the addition of SES predictors in the following multinomial

logit models in chapter five. As stated in the third hypothesis, race differences in depressive symptoms were mediated by SES characteristics. Although race exhibited no net effect on membership in the LoS and Dec. trajectories, preliminary analysis revealed a significant interaction between race and Duncan Index. This interaction was eliminated once I accounted for unequal residual variance.

Chapter 6 provided a look into the within-trajectory differences based on health – related issues. I partitioned each trajectory by race in order to establish significant within-trajectory variation on important health problems that often plague women in midlife. Race differences remained a factor, as blacks reported higher percentages of hypertension and obesity within each trajectory. Black women were also less likely to report excellent health on self-rated measures within every trajectory. This pattern of relative disadvantage for black women versus white women within trajectories will be explored in future research. Perhaps women of different races have different thresholds for assessing their own health, or perhaps they have different thresholds for triggering the expression of depressive symptoms. Both of these suppositions suggest that relative characteristics (relative to others of the same race) may be an important anchoring dimension for women in mid-life, but additional study is necessary to determine whether and how orientation to reference groups might shape the expression of depressive symptoms as well as other sorts of health problems.

The multinomial logit models of chapter 6 also addressed the hypotheses tested in this study. I received partial support for the fourth hypothesis regarding the impact of negative self-ratings of health and the presence of chronic conditions on the high and fluctuating trajectories of depressive symptoms. After controlling for demographic and

other health measures, women with heart disease and hypertension were less likely to report consistently low and decreasing depressive symptoms scores, as compared to consistently high scores, over time. Much of the story, however, was found in reports of excellent and good health. Women in excellent and good health are much more likely to report consistently low (versus high) levels of depressive symptoms over time than are women in poor health during this 11-year span.

Lastly, the results from this research showed no support for the hypothesis that age plays a vital role in understanding the differences in depressive symptoms trajectories among midlife women. The inclusion of age in various functional forms in the multinomial logit models revealed no significant age variation among trajectories. Also, a further look at the bivariate associations in chapter 4 revealed no significant difference between the average ages of women across clusters. Although the NLS-YW is comprised of a 10-year cohort, I expected that there would be some distinctions between younger and older women in reports of depressive symptoms, since the literature generally support the association of age with various measures of well-being, including CES-D reports. In addition, given the historical backdrop in which this cohort came of age, older women may have experienced a great deal of stress in being the “innovators” of their cohort. In turn, younger women in the cohort, or “lagers” were the recipients of the social change initiated by older cohort members. However, based on the findings of this study, the historical period in which these women entered emerging adulthood did not seem to translate into distinct aging patterns affecting depressive symptoms trajectories in midlife. However, the relationship between depressive symptoms (and well-being, in general), cohort, aging, and life course stage has been understudied. Even

so, growing questions about the underlying stability of personality features, the role of social factors (e.g., stigma, diagnoses, treatment options, attitudes) in framing how we think about ‘mental health’ and how we think about and respond to person-based variability in mental health, and the increasing interest in the association of within-person variability across domains are encouraging new, interdisciplinary perspectives in studies of health and well-being.

The lack of significant age differences in establishing and deciphering differences in depressive symptoms trajectories suggests a departure from literature emphasizing age-group comparisons, particularly in depressive symptoms (Nolen-Hoeksema and Ahrens 2002). The results in this study imply that the increasing heterogeneity in women’s lives leads to a decline in historical age-graded norms and structures over the life course. Possible changes in the social structure and how women respond to these changes are crucial elements in understanding the age uniformity in reports of depressive symptoms.

To date, when analyzing the onset and prevalence of depressive symptoms, many researchers have focused on only one aspect of women’s lives. Race, economic, and menopausal-related disparities in depressive symptoms dominate much of the literature involving women’s psychological health (Cohen et al 2006; Gazmararian, James, and Lepkowski 1995; Lorant et al 2003; Scarinci et al 2002; Woods, Mariella, and Mitchell 2002). Furthermore, most studies approach these disparities from a regression-based standpoint, where data is either partitioned based upon the main variable of interest or the main variable is included as a predictor of depressive symptoms. In this study, I take a different, less conventional approach by first conducting a cluster analysis to establish clear patterns depressive symptoms in the sample before considering the predictive

ability of socio-demographic, SES, and health measures. To my knowledge, no prior population-based studies have attempted to examine the impact of a host of measures on depressive symptoms trajectories spanning over ten years.

Though this study has the advantage of taking a more comprehensive examination of depressive symptoms among midlife women, the complexity of the preceding results, coupled with the heterogeneity of women's lives, warrants additional future analyses. One promising avenue of research is the link between race and more detailed measures of socioeconomic achievement processes, specifically those involving occupational and employment status history. It is possible that socioeconomic circumstances, more so than health conditions, fuel high rates of depression among black women in midlife.

Unfortunately, the NLS-YW data, and therefore this study, does not take into account reports of depressive symptoms prior to 1993 as well as past and current clinical depression diagnoses—all of which could be potentially important precursors to the responses evaluated in the present study. Likewise, I only incorporate cross-sectional predictor variables in these analyses, which do not capture key changes in measures such as self-reported health and marital status. Preliminary analyses using crude change variables for the predictor variables were conducted; however, additional research accounting for change is needed.

The lack of age's impact on trajectory membership suggests the use of a better way to account for changes over time. An excellent next step in studying women's depressive symptoms in midlife is through the use of latent growth curve modeling within a multilevel modeling framework, where multiple observations of depressive symptoms scores are nested within individuals (Luke 2004; Ram & Grimm 2007). With

this technique I would be able to better analyze interindividual differences in intraindividual change. Specifically, with growth curve modeling, I can evaluate both how and why individuals vary in their initial reports of depressive symptoms and the rate at which the constructed depressive symptoms trajectories increase or decrease over time.

Although simple latent growth curve analyses can provide vital information on individual change, more sophisticated extensions of conventional growth models may produce valuable information regarding the heterogeneity of the sample and the potential movement of women in and out of different depressive symptoms trajectories. Mixture modeling techniques determine whether unique depressive symptoms trajectory classes exist when the assumptions of simple latent growth curve modeling are relaxed. Mixture models have the ability to lift the single population assumption of latent growth curve modeling to allow for differences in parameter estimates across unobserved subpopulations, using categorical latent classes or variables (Muthen 2004). Therefore, instead of analyzing individual variation around a single growth curve mean, mixture models allow different classes of individuals to vary around different mean growth curves. Two types of mixture models, latent transition analysis (LTA; Lanza et al 2003) and growth mixture modeling (GMM; Muthen & Muthen 1998-2007), are suitable for analyses using longitudinal data. Both techniques are fairly similar; however, LTA allows individuals to transition between latent classes. Therefore, LTA would produce parameter estimates of individuals in each depressive symptoms--based latent class at time 1 and the probability of every response item conditional on depressive symptoms membership (Little et al 2006). Additionally, LTA provides a transition probability matrix estimating the probability of an individual's depressive symptoms membership at

time $t + 1$, conditional on one's membership at time t . For instance, mixture modeling techniques such as LTA would provide the probability of a woman's membership in a consistently high depression latent class in 1995, conditional on the probability of the same woman's membership in the consistently low latent class at the initial survey wave. This line of research introduces a different method of comprehending change over periods of time.

In conclusion, this study represents the first step towards understanding the heterogeneity in depressive symptoms exhibited among women in midlife. This study draws upon both sociological-based life course and psychological-driven life span perspectives to provide greater insight into the continual human development taking place in midlife and to define patterns of depressive symptoms within this life stage. The results illustrate the complexity of the relationship between socioeconomic achievement processes, health conditions, and psychological well being. These results indicate stark contrasts between women who report consistently high and low levels of depressive symptoms and make a strong policy-driven case for focusing on women who are becoming increasingly depressed over time. This study also highlights our need to comprehend true change in life events in middle adulthood, as this stage sets up the platform from which cohorts enter old age.

Bibliography

- Abel EK. 1991. *Who Cares for the Elderly: Public Policy and the Experiences of Adult Daughters*. Philadelphia: Temple University Press.
- Adler NE, Boyce TT, Chesney MA, Cohen SS, Folkman SS, et al. 1994. Socioeconomic Status and Health. The Challenge of the Gradient. *The American Psychologist* 49:15-24.
- Adler NE, Ostrove JM. 1999. Socioeconomic Status and Health: What We Know and What We Don't. *Annals of the New York Academy of Sciences* 896:3-15.
- Aldenderfer MS, Blashfield RK. 1984. *Cluster Analysis*. Newbury Park, CA: Sage Publications.
- Aneshensel C. 1986. Marital and Employment Role-Strain, Social Support, and Depression Among Adult Women. In *Stress, Social Support, and Women*, ed. S Hobfoll. Washington, D.C.: Hemisphere.
- Aneshensel CS, Frerichs RR, Clark VA. 1981. Family Roles and Sex Differences in Depression. *Journal of Health and Social Behavior* 22:379-93.
- Antonucci TC, Akiyama H, Merline A. 2001. Dynamics of social relationships in midlife. In *Handbook of Midlife Development*, ed. ME Lachman, pp. 571-98. New York: Wiley.
- Arnett JJ. 1998. Learning to Stand Alone: The Contemporary American Transition to Adulthood in Cultural and Historical Context. *Human development* 41:295.
- Arnett JJ. 2000. Emerging Adulthood: A Theory of Development from the Late Teens Through the Twenties. *American Psychologist* 55:469-80.
- Avis NE, Brambilla D, McKinlay SM, Vass K. 1994. A Longitudinal Analysis of the Association between Menopause and Depression. Results from the Massachusetts Women's Health Study. *Annals of Epidemiology* 4:214-20.
- Avis NE. 1999. Women's Health at Midlife. In *Life in the Middle: Psychological and Social Development in Middle Age*, ed. SL Willis, JD Reid, pp. 105-47. San Diego: Academic.

- Bacher J. 1996. K-Means. In *Clusteranalyse*, ed. J Bacher, pp. 308-48. Muenchen, Wien: Oldenbourg.
- Bair MJ, Robinson RL, Katon W, Kroenke K. 2003. Depression and Pain Comorbidity: A Literature Review. *Archives of Internal Medicine* 163:2433.
- Ballenger JC, Davidson JR, Lecrubier Y, Nutt DJ, Kirmayer LJ, et al. 2001. Consensus statement on transcultural issues in depression and anxiety from the International Consensus Group on Depression and Anxiety. *Journal of Clinical Psychiatry* 62:47-55.
- Baltes PB. 1987. Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental psychology* 23:611.
- Baltes PB, Baltes MM. 1990. Psychological Perspectives on Successful Aging: The Model of Selective Optimization with Compensation. In *Successful Aging: Perspectives from the Behavioral Sciences*, ed. PB Baltes, MM Baltes, pp. 1-34. New York: Cambridge University Press.
- Baltes PB, U.M. Staudinger, and U. Lindenberger. 1999. Life-Span Psychology: Theory and Application to Intellectual Functioning. *Annual Review of Psychology* 50:471-507.
- Bancroft J, Rennie D. 1993. The impact of oral contraceptives on the experience of perimenstrual mood, clumsiness, food craving and other symptoms. *Journal of Psychosomatic Research* 37:195-202.
- Bebbington PE. 1998. Sex and Depression. *Psychological Medicine* 28:1-8.
- Belle D. 1982. Social Ties and Social Support. In *Lives in Stress: Women and Depression*, ed. D Belle. Beverly Hills, CA: Sage.
- Belle D, Doucet J. 2003. Poverty, Inequality, and Discrimination as Sources of Depression Among U.S. Women. *Psychology of Women Quarterly* 27:101-13.
- Ben-Shlomo Y, Kuh D. 2002. A life course approach to chronic disease epidemiology: conceptual models, empirical challenges and interdisciplinary perspectives. *International Journal of Epidemiology* 31:285-93.
- Blashfield RK. 1976. Mixture Model tests of Cluster Analysis: Accuracy of Four Agglomerative Hierarchical Methods. *Psychological Bulletin* 83:377-88.
- Blazer DG, Kessler RC, McGonagle KA, Swartz MS. 1994. The prevalence and distribution of major depression in a national community sample: The National Comorbidity Survey. *American Journal of Psychiatry* 151:979-86.

- Bosworth HB, Bastian LA, Kuchibhatla MN, Steffens DC, McBride CM, et al. 2001. Depressive Symptoms, Menopausal Status, and Climacteric Symptoms in Women at Midlife. *Psychosomatic Medicine* 63:603-8.
- Bowles C. 1986. Measure of attitude toward menopause using the semantic differential model. *Nursing Research* 35:81-5.
- Brezinka V, Kittel F. 1996. Psychosocial factors of coronary heart disease in women: A review. *Social Science and Medicine* 42:1351-65
- Bromberger JT, Harlow S, Avis N, Kravitz HM, Cordal A. 2004. Racial/Ethnic Differences in the Prevalence of Depressive Symptoms Among Middle-Aged Women: The Study of Women's Health Across the Nation (SWAN). *American Journal of Public Health* 94:1378-85.
- Bromberger JT, Kravitz HM, Wei H-L, Brown C, Youk AO, et al. 2005. History of depression and women's current health and functioning during midlife. *General Hospital Psychiatry* 27:200-8.
- Brown G, Bhrolchain M, Harris T. 1975. Social Class and Psychiatric Disturbance among Women in an Urban Population. *Sociology* 9:225-54.
- Burton L, Bengston, VL. 1985. Black Grandmothers: Issues of Timing and Continuity of Roles. In *Grandparenthood*, ed. VL Bengston, and J.F. Robertson, pp. 61-77. Beverly Hills, CA: Sage.
- Carr D. 2003. Socioeconomic Background and Midlife Health in the United States. In *Focus on Economic Outcomes in Later Life: Public Policy, Health, and Cumulative Advantage*, ed. S Crystal, KW Schaie, D Shea, pp. 155-76. New York: Springer Publishing Company.
- Chen F, El-Dawlatly S, Jin R, Oweiss K. 2007. Identifying and Tracking the Number of Independent Clusters of Functionally Interdependent Neurons From Biophysical Models of Population Activity. East Lansing, MI: Michigan State University.
- Chirikos TN, Nickel JL. 1984. Work disability from coronary heart disease in women. *Women's Health* 9:55-74.
- Clark DO, Maddox GL. 1992. Racial and social correlates of age-related changes in functioning. *Journals of Gerontology: Social Sciences* 47:S222-S32.
- Clark R, Anderson NB, Clark VR, Williams DR. 1999. Racism as a stressor for African Americans: A biopsychosocial model. *American Psychologist* 54:805-16.

- Cleary PD, Mechanic D. 1983. Sex Differences in Psychological Distress among Married People. *Journal of Health & Social Behavior* 24:111-21.
- Cleary PD, Zaborski LB, Ayanian MD. 2004. Sex Differences in Health Over the Course of Midlife. In *How Healthy Are We? A National Study of Well-Being in Midlife*, ed. OG Brim, CD Ryff, R Kessler, pp. 37-63. Chicago: University of Chicago Press.
- Cohen LS, Soares CN, Vitonis AF, Otto MW, Harlow BL. 2006. Risk for New Onset of Depression During the Menopausal Transition: The Harvard Study of Moods and Cycles. *Archives of General Psychiatry* 63:385-90.
- Coryell W, Scheftner W, Keller M, Endicott J, Maser J, Klerman GL. 1993. The enduring psychosocial consequences of mania and depression. *American Journal of Psychiatry* 150:720-7.
- Cyranowski JM, Frank E, Young E, Shear MK. 2000. Adolescent Onset of the Gender Difference in Lifetime Rates of Major Depression: A Theoretical Model. *Archives of General Psychiatry* 57:21-7.
- Dennerstein L, Dudley E, Guthrie J. 2002. Empty nest or revolving door? A prospective study of women's quality of life in midlife during the phase of children leaving and re-entering the home. *Psychological Medicine* 32:545-50.
- Dew M. 1998. Psychiatric Disorder in the Context of Physical Illness. In *Adversity, Stress, and Psychopathology*, ed. BP Dohrenwend, pp. 219-32. New York: Oxford University Press.
- Diewald M. 2001. Unitary Social Science for Causal Understanding: Experiences and Prospects of Life Course Research. *Canadian studies in population* 28:219.
- Ding C, He X. 2004. K-means Clustering Via Principal Component Analysis. *Proceedings of the 21st International Conference on Machine Learning*, pp. 1-8. Banff, Canada.
- Dohrenwend BS. 1973. Social Status and Stressful Life Events. *Journal of Personality and Social Psychology* 28:225-35.
- Eaker ED, Packard B, Wenger NK, Clarkson TB, Tyroler HA, eds. 1987. *Coronary Heart Disease in Women*. New York: Haymarket Doyma.
- Earle JR, Smith MH, Harris CT, Longino CF. 1998. Women, Marital Status, and Symptoms of Depression in a Midlife National Sample. *Journal of Women & Aging* 10:41-57.

- Edin K, Lein L. 1997. *Making Ends Meet: How Single Mothers Survive Welfare and Low-Wage Work*. New York: Russell Sage Foundation.
- Eriksson E, Andersch B, Ho HP, Landen M, Sundblad C. 2002. Diagnosis and treatment of premenstrual dysphoria. *Journal of Clinical Psychiatry* 63:16-23.
- Fleiss JL, Zubin J. 1969. On the Methods and Theory of Clustering. *Multivariate Behavioral Research* 4:235-50.
- Fox NA, Porges SW. 1985. The Relationship between Neonatal Heart Period Patterns and Developmental Outcomes. *Child Development* 56:28-37.
- Fraley C, Raftery AE. 1998. How Many Clusters? Which Clustering Method? Answers Via Model-Based Cluster Analysis. *The Computer Journal* 41:578-88.
- Freeman EW, Sammel MD, Liu L, Gracia CR, Nelson DB, Hollander L. 2004. Hormones and Menopausal Status as Predictors of Depression in Women in Transition to Menopause. *Archives of General Psychiatry* 61:62.
- Galaif ER, Nyamathi AM, Stein JA. 1999. Psychosocial Predictors of Current Drug Use, Drug Problems, and Physical Drug Dependence in Homeless Women. *Addictive Behaviors* 24:801-14.
- Gazmararian JA, James SA, Lepkowski JM. 1995. Depression in Black and White Women. The Role of Marriage and Socioeconomic Status. *Annals of Epidemiology* 5:455-63.
- Gold EB, Sternfeld B, Kelsey JL, Brown C, Mouton C, et al. 2000. Relation of demographic and lifestyle factors to symptoms in a multi racial/ethnic population of women 40-55 years of age. *American Journal of Epidemiology* 152:463-73.
- Gore S, Mangione TW. 1983. Social Roles, Sex Roles and Psychological Distress: Additive and Interactive Models of Sex Differences. *Journal of Health and Social Behavior* 24:300-12.
- Gove WR. 1984. Gender Differences in Mental and Physical Illness among Men and Women. *Social Science and Medicine* 19:77-91.
- Greene JG, Cooke DJ. 1980. Life stress and symptoms at the climacterium. *The British Journal of Psychiatry* 136:486.
- Greene WH. 2003. *Econometric Analysis*. New Jersey: Prentice-Hall.

- Griffin JM, Fuhrer R, Stansfeld SA, Marmot M. 2002. The importance of low control at work and home on depression and anxiety: do these effects vary by gender and social class? *Social Science & Medicine* 54:783-98.
- Hajjar I, Kotchen TA. 2003. Trends in Prevalence, Awareness, Treatment, and Control of Hypertension in the United States, 1988-2000. *Journal of the American Medical Association* 290:199-206.
- Halkidi M, Batistakis Y, Vazirgiannis M. 2001. On Clustering Validation Techniques. *Journal of Intelligent Information Systems* 17:107-45.
- Hann D, Winter K, Jacobsen P. 1999. Measurement of Depressive Symptoms in Cancer Patients: Evaluation of the Center for Epidemiological Studies Depression Scale (CES-D). *Journal of Psychosomatic Research* 46:437-43.
- Hartigan JA. 1975. *Clustering Algorithms*. New York: Wiley.
- Hayward MD, Heron M. 1999. Racial Inequality in Active Life Among Adult Americans. *Demography* 36:77-91.
- Heckhausen J. 2001. Adaptation and Resilience. In *Handbook of Midlife Development*. ME Lachman, pp. 345-91. New York: Wiley.
- Held T. 1986. Institutionalization and Deinstitutionalization of the Life Course. *Human Development* 29:157-62.
- Hoffman SS, Duncan G. 1988. Multinomial and Conditional Logit Discrete-Choice Models in Demography. *Demography* 25:415-27.
- Holzberg AD, Robinson ME, Geisser ME, Gremillion HA. 1996. The effects of depression and chronic pain on psychosocial and physical functioning. *The Clinical Journal of Pain* 12:25.
- Hunter MS. 1990. Psychological and somatic experience of the menopause: a prospective study [corrected]. *Psychosomatic Medicine* 52:357-67.
- Jain AK, Dubes RC. 1988. *Algorithms for Clustering Data*. Englewood Cliffs, NJ: Prentice Hall.
- Jain AK, Murty MN, Flynn PJ. 1999. Data Clustering: A Review. *ACM Computing Surveys* 31:264-323.
- Jaques E. 1965. Death and the Mid-Life Crisis. *International Journal of Psychoanalysis* 46:502-14.

- Jonas BS, Franks P, Ingram DD. 1997. Are symptoms of anxiety and depression risk factors for hypertension? Longitudinal evidence from the National Health and Nutrition Examination Survey I Epidemiologic Follow-up Study. *Archives of Family Medicine* 6:43-9.
- Jones DJ, Bromberger JT, Sutton-Tyrrell K, Matthews KA. 2003. Lifetime History of Depression and Carotid Atherosclerosis in Middle-aged Women. *Archives of General Psychiatry* 60:153.
- Judd LL, Akiskal HS, Maser JD, Zeller PJ, Endicott J, et al. 1998. Major depressive disorder: A prospective study of residual subthreshold depressive symptoms as predictor of rapid relapse. *Journal of Affective Disorders* 50:97-108.
- Kagan J. 1994. *Galen's Prophecy*. New York: Basic Books.
- Kannel WB, Wilson PWF. 1995. Risk Factors that Attenuate the Female Coronary Artery Disease Advantage. *Archives of Internal Medicine* 155:57-61.
- Kaufert PA, Gilbert P, Tate R. 1992. The Manitoba project: a re-examination of the link between menopause and depression. *Maturitas* 14:143-55.
- Kay M, Voda A, Olivas G, Rios F, Imle M. 1982. Ethnography of the menopause-related hot flash. *Maturitas* 4:217-27.
- Kessler RC. 2003. Epidemiology of Women and Depression. *Journal of Affective Disorders* 74:5-13.
- Kessler RC, McGonagle KA, Nelson CB, Hughes M, Swartz M, Blazer DG. 1994. Sex and depression in the National Comorbidity Survey. II: Cohort effects. *Journal of Affective Disorders* 30:15-26.
- Kim JE, Moen P. 2001. Moving into Retirement: Preparation and Transitions in Late Midlife. In *Handbook of Midlife Development*, ed. ME Lachman, pp. 487-527. New York: Wiley.
- Kohli ML, Kunemund H. 2005. The Midlife Generation in the Family: Patterns of Exchange and Support. In *Middle Adulthood: A Lifespan Perspective*, ed. SL Willis, M Martin, pp. 35-62. Thousand Oaks: Sage.
- Kristeller JL, Rodin J. 1989. Identifying Eating Patterns in Male and Female Undergraduates Using Cluster Analysis. *Addictive Behaviors* 14:631-42.
- Kuh D, and Y. Ben-Shlomo, ed. 1997. *A Life Course Approach to Chronic Disease Epidemiology: Tracing the Origins of Ill-Health From Early to Adult Life*. Oxford: Oxford University Press.

- Kuh D, Hardy R. 2002. A Life Course Approach to Women's Health: Does the Past Predict the Present? In *A Life Course Approach to Women's Health* ed. D Kuh, and Rebecca Hardy, pp. 3-22. Oxford: Oxford University Press.
- Kuh DL, Wadsworth M, Hardy R. 1997. Women's health in midlife: the influence of the menopause, social factors and health in earlier life. *BJOG: An International Journal of Obstetrics and Gynaecology* 104:923-33.
- Lachman ME, James JB, eds. 1997. *Multiple Paths of Midlife Development*. Chicago: University of Chicago Press.
- Lachman ME. 2004. Development in Midlife. *Annual Review of Psychology* 55:305-31.
- Lachman ME, Bertrand RM. 2001. Personality and the Self in Midlife. In *Handbook of Midlife Development*, ed. ME Lachman, pp. 279-309. New York: Wiley.
- Lanza ST, Flaherty BP, Collins LM. 2003. Latent Class and Latent Transition Analysis. In *Handbook of Psychology*, ed. JA Schinka, WF Velicer, pp. 663-85. Hoboken, NJ: Wiley.
- Larson SL, Clark MR, Eaton WW. 2004. Depressive disorder as a long-term antecedent risk factor for incident back pain: a 13-year follow-up study from the Baltimore Epidemiological Catchment Area Sample. *Psychological Medicine* 34:211-9.
- Lawlor DA, Davey Smith G, Patel R, Ebrahim S. 2005. Life-Course Socioeconomic Position, Area Deprivation, and Coronary Heart Disease: Findings From the British Women's Heart and Health Study. *American Journal of Public Health* 95:91-7.
- Leiblum SR, Swartzman LC. 1986. Women's attitudes toward the menopause: an update. *Maturitas* 8:47-56.
- Link BG, Lennon MC, Dohrenwend BP. 1993. Socioeconomic Status and Depression: The Role of Occupations Involving Direction, Control, and Planning. *American Journal of Sociology* 98:1351.
- Link BG, Phelan J. 1995. Social Conditions as Fundamental Causes of Disease. *Journal of Health and Social Behavior, Extra Issue: Forty Years of Medical Sociology: The State of the Art and Directions for the Future* 35:80-94.
- Link BG, Phelan JC. 1996. Understanding sociodemographic differences in health--the role of fundamental social causes. *American Journal of Public Health* 86:471-3.

- Link BG, Phelan, J. 2000. Evaluating the Fundamental Cause Explanation for Social Disparities in Health. In *Handbook of Medical Sociology*, ed. C Bird, P. Conrad, and A. Fremont, pp. 33-46. Upper Saddle River, NJ: Prentice-Hall.
- Little TD, Bovaird JA, Slegers DW. 2006. Methods for the Analysis of Change. In *Handbook of Personality Development*, ed. DK Mroczek, TD Little, pp. 181-212. Mahwah, NJ: Lawrence Erlbaum Associates.
- Loomis LS, Booth A. 1995. Multigenerational Caregiving and Well-being; The Myth of the Beleaguered Sandwich Generation. *Journal of Family Issues* 16:131-48.
- Lorant V, Deliege D, Eaton W, Robert A, Philippot P, Ansseau M. 2003. Socioeconomic Inequalities in Depression: A Meta-Analysis. *International Journal of Epidemiology* 157:98-112.
- Luke DA. 2004. *Multilevel Modeling*. Thousand Oaks: Sage. 79 pp.
- Lynch JW, Kaplan GA, Shema SJ. 1997. Cumulative Impact of Sustained Economic Hardship on Physical, Cognitive, Psychological, and Social Functioning. *The New England Journal of Medicine* 337:1889-95.
- Lynch SM. 2003. Cohort and Life-Course Patterns in the Relationship Between Education and Health: A Hierarchical Approach. *Demography* 40:309-31.
- Maciejewski PK, Prigerson HG, Mazure CM. 2001. Sex differences in event-related risk for major depression. *Psychological Medicine* 31:593-604.
- Magai C, Halpern B. 2001. Emotional Development During the Middle Years. In *Handbook of Midlife Development*, ed. ME Lachman, pp. 310-44. New York: Wiley.
- Makosky V. 1982. Sources of Stress: Events or Conditions? In *Lives in Stress: Women and Depression*, ed. D Belle. Beverly Hills, CA: Sage.
- Markman M. 2007. Comorbidity as a Focus of Clinical Cancer Trials: An Important Unmet Need. *Oncology* 73:279-80.
- Marks NF. 1996. Flying Solo at Midlife: Gender, Marital Status, and Psychological Well-Being. *Journal of Marriage and the Family* 917-32.
- Marks NF, Lambert J. 1998. Marital Status Continuity and Change among Young and Midlife Adults. *Journal of Family Issues* 19:652-87.

- Martin M, Zimprich D. 2005. Cognitive Development in Midlife. In *Middle Adulthood: A Lifespan Perspective*, ed. SL Willis, M Martin, pp. 179-206. Thousand Oaks: Sage.
- Maughan B. 2002. Depression and Psychological Distress: A Life Course Perspective. In *A Life Course Approach to Women's Health*, ed. D Kuh, R Hardy. Oxford: Oxford University Press.
- Mayer KU. 2003. The Sociology of the Life Course and Lifespan Psychology: Diverging or Converging Pathways? In *Understanding Human Development: Dialogues with Lifespan Psychology*, ed. UM Staudinger, and U. Lindenberger, pp. 463-81. Norwell, MA: Kluwer Academic.
- McDaniel JS, Musselman DL, Porter MR, Reed DA. 1995. Depression in Patients with Cancer. *Archives of General Psychiatry* 52:89-99.
- McEwen BS. 2001. From Molecules to Mind: Stress, Individual Differences, and the Social Environment. In *Annals of the New York Academy of Sciences*, pp. 42-9.
- McKinlay JB, McKinlay SM, Brambilla D. 1987. The Relative Contributions of Endocrine Changes and Social Circumstances to Depression in Mid-Aged Women. *Journal of Health and Social Behavior* 28:345-63.
- Merrill SS, Verbrugge LM. 1999. Health and Disease in Midlife. In *Life in the Middle: Psychological and Social Development in Middle Age*, ed. SL Willis, JD Reid, pp. 77-103. San Diego: Academic.
- Miech R, Shanahan M. 2000. Socioeconomic Status and Depression over the Life Course. *Journal of Health and Social Behavior* 41:162-76.
- Milligan GW, Cooper MC. 1987. Methodology Review: Clustering Methods. *Applied Psychological Measurement* 11:329-54.
- Moen PP, Robison JJ, Dempster-McClain DD. 1995. Caregiving and women's well-being: a life course approach. *Journal of health & social behavior* 36:259-73.
- Moen P, Wethington E. 1999. Mid-life Development in a Life Course Context. In *Life in the Middle: Psychological and Social Development in Middle Age*, ed. SL Willis, JD Reid, pp. 3-25. San Diego, CA: Academic Press.
- Murray CJL, Lopez AD. 1996. *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020*. Cambridge, MA: Harvard University Press.

- Muthen B. 2004. Latent Variable Analysis: Growth Mixture Modeling and Related Technique for Longitudinal Data. In *Handbook of Quantitative Methodology for the Social Sciences*, ed. D Kaplan, pp. 345-68. Newbury Park, CA: Sage.
- Muthen LK, Muthen B. 1998-2007. *Mplus User's Guide*. Los Angeles: Muthen & Muthen.
- Myers HF, Lesser I, Rodriguez N, Mira CB, Hwang WC, et al. 2002. Ethnic differences in clinical presentation of depression in adult women. *Cultural Diversity and Ethnic Minority Psychology* 8:138-56.
- National Institute of Mental Health (NIMH). 2007. Depression. National Institutes of Health. NIH Publication No. 07-3561, pp. 1-24.
- Neugarten BL. 1968. The Awareness of Middle Age. In *Middle Age and Aging: A Reader in Social Psychology*, ed. BL Neugarten, pp. 93-8. Chicago: University of Chicago Press.
- Nesselroade JR. 1991. Interindividual Differences in Intraindividual Change. In *Best Methods for the Analysis of Change*, ed. LM Collins, and J.L. Horn, pp. 92-105. Washington, DC: American Psychological Association.
- Nesselroade JR, Featherman DL. 1997. Establishing a Reference Frame Against Which to Chart Age-Related Change. In *Studying Aging and Social Change: Conceptual and Methodological Issues*, ed. MA Hardy, pp. 191-205. Thousand Oaks, CA: Sage.
- Nesselroade JR, Ram N. 2004. Studying Intraindividual Variability: What We Have Learned That Will Help Us Understand Lives in Context. *Research in Human Development* 1:9-29.
- Noble RE. 2005. Depression in Women. *Metabolism Clinical and Experimental* 54:49-52.
- Onyike C, Crum RM, Lee HB, Lyketsos CG, Eaton WW. 2003. Is Obesity Associated with Major Depression? Results from the Third National Health and Nutrition Examination Survey. *American Journal of Epidemiology* 158:1139-47.
- O'Rand AM. 1996. The Precious and the Precocious: Understanding Cumulative Disadvantage and Cumulative Advantage over the Life Course. *The Gerontologist* 36:230-6.
- Parry G. 1986. Paid Employment, Life Events, Social Support, and Mental Health in Working-Class Mothers. *Journal of Health and Social Behavior* 27:193-208.

- Pavalko EK, Artis JE. 1997. Women's caregiving and paid work: causal relationships in late midlife. *Journals of Gerontology: Social Sciences* 52:170-9.
- Perrig-Chiello P, Perren S. 2005. Impact of Past Transitions on Well-Being in Middle Age. In *Middle Adulthood: A Lifespan Perspective*, ed. SL Willis, M Martin, pp. 143-78. Thousand Oak, CA: Sage.
- Pope SK, Sowers MF, Welch GW, Albrecht G. 2001. Functional limitations in women at midlife: the role of health conditions, behavioral and environmental factors. *Women's Health Issues* 11:494-502.
- Pulkkinen L, Feldt T, Kokko K. 2005. Personality in Young Adulthood and Functioning in Middle Age. In *Middle Adulthood: A Lifespan Perspective*, ed. SL Willis, M Martin, pp. 99-142. Thousand Oaks: Sage.
- Radloff L. 1977. The CES-D Scale: A Self-Report Depression Scale for Research in the General Population. *Applied Psychological Measurement* 1:385-481.
- Raikkonen K, Matthews KA, Kuller LH. 2001. Trajectory of Psychological Risk and Incident Hypertension in Middle-Aged Women. *Hypertension* 38:798-802.
- Ram N, Grimm K. 2007. Using Simple and Complex Growth Models to Articulate Developmental Change: Matching Theory to Method. *International Journal of Behavioral Development* 31:303-16.
- Regier DA, Myers JK, Kramer M, Robins LN, Blazer DG, et al. 1984. The NIMH Epidemiologic Catchment Area program. Historical context, major objectives, and study population characteristics. *Archives of General Psychiatry* 41:934-41.
- Repetti RL, Crosby F. 1984. Gender and Depression: Exploring the Adult Role Explanation. *Journal of Social and Clinical Psychology* 2:57-70.
- Repetti RL, Matthews KA, Waldron I. 1989. Employment and women's health. *American Psychologist* 44:1394-401.
- Riley MW. 1987. On the significance of age in sociology. *American Sociological Review* 52:1-14.
- Roesler TA, McKenzie N. 1994. Effects of childhood trauma on psychological functioning in adults sexually abused as children. *The Journal of Nervous and Mental Disease* 182:145-50.
- Rook KS. 2003. Exposure and Reactivity to Negative Social Exchanges: A Preliminary Investigation Using Daily Diary Data. *Journals of Gerontology: Social Sciences* 58:100-11.

- Rossi AS. 2004. The Menopausal Transition and Aging Processes. In *How Health Are We? A National Study of Well-being in Midlife*, ed. OG Brim, CD Ryff, R Kessler, pp. 550-75. Chicago: University of Chicago Press.
- Rutledge T, Hogan BE. 2002. A Quantitative Review of Prospective Evidence Linking Psychological Factors With Hypertension Development. *Psychosomatic Medicine* 64:758-66.
- Ryff CD, Seltzer MM. 1996. *The Parental Experience in Midlife*: University of Chicago Press.
- Schellevis FG, van der Velden J, van de Lisdonk E, van Eijk JT, van Weel C. 1993. Comorbidity of chronic diseases in general practice. *Journal of Clinical Epidemiology* 46:469-73.
- Settersten Jr RA. 2005. Toward a Stronger Partnership Between Life-Course Sociology and Life-Span Psychology. *Research in human development* 2:25.
- Sherbourne CD, Wells KB, Hays RD, Rogers W, Burnam MA, Judd LL. 1994. Subthreshold depression and depressive disorder: clinical characteristics of general medical and mental health specialty outpatients. *American Journal of Psychiatry* 151:1777-84.
- Simkin-Silverman LR, Wing RR, Boraz MA, Kuller LH. 2003. Lifestyle Intervention Can Prevent Weight Gain During Menopause: Results From a 5-Year Randomized Clinical Trial. *Annals of Behavioral Medicine* 26:212-20.
- Smith JP. 2005. Unraveling the SES-Health Connection. *Population and development review* 30:108-32.
- Solomon ARI, Haaga DAF, Arnow BA. 2001. Is Clinical Depression Distinct from Subthreshold Depressive Symptoms? A Review of the Continuity Issue in Depression Research. *The Journal of Nervous and Mental Disease* 189:498.
- Steiner M, Yonkers K. 1998. *Depression in Women*. London: Martin Dunitz.
- Strawbridge WJ, Wallhagen M, Shema S, Kaplan G. 1997. New Burdens or More of the Same? Comparing Grandparent, Spouse, and Adult-Child Caregivers. *The Gerontologist* 37:505-10.
- Sugar CA, James GM. 2003. Finding the Number of Clusters in a Dataset: An Information-Theoretic Approach. *Journal of the American Statistical Association* 98:750-63.

- Turner MJ, Killian TS, Cain R. 2004. Life Course Transitions and Depressive Symptoms among Women in Midlife. *International Journal of Aging and Human Development* 58:241-65.
- van den Akker M, Buntinx F, Metsemakers JFM, Roos S, Knottnerus JA. 1998. Multimorbidity in General Practice: Prevalence, Incidence, and Determinants of Co-Occurring Chronic and Recurrent Diseases. *Journal of Clinical Epidemiology* 51:367-75.
- Verbrugge LM. 1995. Seven chronic conditions: their impact on US adults' activity levels and use of medical services. *American Journal of Public Health* 85:173-82.
- Wahl H-W, Kruse A. 2005. Historical Perspectives of Middle Age Within the Life Span. In *Middle Adulthood: A Lifespan Perspective*, ed. SL Willis, M Martin, pp. 3-34. Thousand Oaks: Sage Publications.
- Waldron I, Weiss CC, Hughes ME. 1998. Interacting Effects of Multiple Roles on Women's Health. *Journal of Health and Social Behavior* 39:216-36.
- Walen HR, Lachman ME. 2000. Social Support and Strain from Partner, Family, and Friends: Costs and Benefits for Men and Women in Adulthood. *Journal of Social and Personal Relationships* 17:5-30.
- Weissman MM, Klerman GL. 1977. Sex Differences and the Epidemiology of Depression. *Archives of General Psychiatry* 34:98-111.
- Weissman MM, Wickramaratne PJ, Greenwald S, Hsu HY, Ouellette R, et al. 1992. The changing rate of major depression—cross-national comparisons. *Journal of the American Medical Association* 268:3098-105.
- Wells KB, Stewart A, Hays RD, Burnam MA, Rogers W, et al. 1989. The functioning and well-being of depressed patients. Results from the Medical Outcomes Study. *Journal of the American Medical Association* 262:914-9.
- Wethington E, Kessler R, Pixley J. 2004. Turning Points in Adulthood. In *How Healthy Are We? A National Study of Well-Being in Midlife*, ed. OG Brim, CD Ryff, RC Kessler, pp. 586-613. Chicago: University of Chicago Press.
- Weyerer S. 1992. Physical inactivity and depression in the community. Evidence from the Upper Bavarian Field Study. *International Journal of Sports Medicine* 13:492-6.
- Wilkins WL. 1974. Social Stress and Illness in Industrial Society. In *Life Stress and Illness*, ed. EKE Gunderson, RH Rahe, pp. 242-54. Springfield, IL: Charles C. Thomas.

- Williams D, Collins C. 1995. U.S. socioeconomic and racial differences in health. *Annual Review of Sociology* 21:349.
- Williams DR, Lavizzo-Mourey R, Warren RC. 1994. The Concept of Race and Health Status in America. *Public Health Reports* 109.
- Willson AE, K.M. Shuey, and G.H. Elder. 2007. Cumulative Advantage Processes as Mechanisms of Inequality in Life-Course Health. *American Journal of Sociology*.
- Wing RR, Matthews KA, Kuller LH, Meilahn EN, Plantinga PL. 1991. Weight gain at the time of menopause. *Archives of Internal Medicine* 151:97-102.
- Wolfe JH. 1970. Pattern Clustering by Multivariate Mixture Analysis. *Multivariate Behavioral Research* 5:329-50.
- Woods NF, Mitchell ES. 1997. Pathways to Depressed Mood for Midlife Women: Observations From the Seattle Midlife Women's Health Study. *Research in Nursing & Health* 20:119-29.
- Woods NF, Mariella A, Mitchell ES. 2002. Patterns of Depressed Mood Across the Menopausal Transition: Approaches to Studying Patterns in Longitudinal Data. *Acta Obstetrica et Gynecologica Scandinavica* 81:623-32.
- Wray LA, Blaum CS. 2001. Explaining the Role of Sex on Disability A Population-Based Study. *The Gerontologist* 41:499-510.
- Zagorsky J, Rhoton P. 1998. Attrition and the National Longitudinal Surveys' Young Women Cohort, Center for Human Resource Research, Columbus, OH.

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- 1999 to 2001 Community Skills Instructor, The Autism Society of North Carolina

Publications

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Selected Presentations

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