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RECONCILING BIOPHYSICAL AND PSYCHOSOCIAL MODELS OF STRESS IN RELOCATION AMONG OLDER WOMEN

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Abstract of Dissertation

Heidi Harriman Ewen

The Graduate School
University of Kentucky
2006

RECONCILING BIOPHYSICAL AND PSYCHOSOCIAL MODELS OF STRESS
IN RELOCATION AMONG OLDER WOMEN

ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Public Health
at the University of Kentucky

By
Heidi Harriman Ewen
Lexington, KY

Co-Directors: Dr. Graham D. Rowles, Professor and Director,
Graduate Center for Gerontology and
Dr. John F. Wilson, Professor and Vice Chair, Behavioral Science

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The decision to relocate or to age in place can be a difficult one, mitigated by a variety of influencing factors such as finances, physical abilities, as well as social and instrumental support from family and others. This study focuses on the stresses of residential relocation to independent and assisted living facilities among older women living in Lexington, Kentucky. Participation entailed three semi-structured interviews as well as saliva and blood sampling over a period of 6 months, beginning within one month of the move. Measures of cortisol were used as indicators of stress reactivity. Distinct patterns of cortisol response have been identified, with those who indicated the relocation was the result of health issues or anticipated health issues showing the greatest degree of physiological stress reactivity. The majority of women reveal satisfactory psychosocial adjustment, with women indicating the move was facilitated by need for caring for ailing family showing the least amount of facility integration. Significant life events appear to be related to social integration, stress reactivity, and perceptions of facility life over the course of the first six months in residence. These results have implications for facility managers with regard to facilitation of new and prospective resident acclimation and possible interventions aimed at reducing adaptation time among those on waitlists for such facilities.

Keywords: Relocation, Stress, Adaptation, Aging, Women

Heidi Harriman Ewen
July 25, 2006

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Dedication

This thesis is dedicated to my parents and dearest friends,
Ms. Marjorie Etta Harriman
and the late MSgt. Richard Edwin Harriman

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This dissertation, while an original work, benefited from the insights and direction of several people. First, Dr. Graham Rowles and Dr. John Wilson, the co-chairs of my committee, exemplify the high quality scholarship to which I aspire. They have been excellent mentors and guides along my journey. Dr. Sandra Legan sacrificed her time, lab space, and resources to train me in endocrinological laboratory methods and was an incredible teacher. Dr. Stiles provided feedback and a medical perspective beginning with the proposal through the completed project. Dr. John Watkins and Dr. Mitzi Schumacher have challenged and motivated me to think critically about the theories and methods involved in interdisciplinary research. Additionally, I'd like to thank the invisible member of my committee, Dr. John A. Krout. It was he who originally encouraged me to apply to the Gerontology doctoral program, mentored me in interdisciplinary research, and gave me extraordinary research opportunities with the Pathways to Life Quality study.

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PROLOGUE

George and Mary moved to Cincinnati, Ohio in the 1960's and bought a stylish three-bedroom ranch home in a growing suburban community. George was a new faculty member at the University and Mary was a homemaker, content to stay home to provide care and recreation for their four children. Over the years, the children matured, left for college and began lives of their own. As the nest began to empty, Mary found herself busy with church activities, tutoring underprivileged children, and gardening. After George retired, they would travel two months of the year to visit three of their four children who had settled in different states. Their youngest daughter settled fairly close in Lexington, Kentucky. Several years after George retired, he had a massive heart attack and began to show signs of vascular dementia. He was unable to participate in many of the activities he once enjoyed, including travel. Mary's caregiving responsibilities began to consume increasing amounts of her time as George's health continued to decline. In the winter of 2003, George passed away quietly in the home he and Mary had shared for forty years. Mary soon discovered she had lost touch with most of her friends, and while her daughter lived within 90 miles she only saw her once a month. Her income had decreased by nearly half after George's death and she found meeting the monthly bills more challenging. The stairs on the back of her house were falling into disrepair. Her sleep patterns, disrupted during the latter stages of George's life, were now limited to two-hour naps throughout the day and night. Her daughter suggested she move to a retirement community in Lexington so they could be nearer to each other, but Mary's initial reaction was unfavorable. How could she give up the home she and George had shared for so many years? What would she do with all of their things, possessions that were tied to memories from the course of her life? Would moving into an apartment save her any money or deplete her savings more rapidly?

Mary's daughter assembled a packet of information on materials from various senior housing facilities in Lexington and sent them to her mother along with a note expressing a desire to have her mother closer. As Mary reviewed the materials, she noticed that many of the facilities were affiliated with local churches, were not as expensive as she had believed them to be, and afforded a wealth of services and

recreational opportunities. As soon as she started considering this as a possibility, she again returned to the issue of having to part with her belongings and decided to wait a while longer. However, one morning in the early spring when a fine layer of frost coated all the outdoor surfaces, Mary slipped on the rickety back steps. She struggled to right herself and then realized that the pain in her leg was the result of a broken bone. Her heart started to pound as she struggled to figure out a way to minimize the pain, stay warm, and find help. It was morning and she knew her neighbors would be leaving for work before too long, so if she could make enough noise to get their attention perhaps they could call an ambulance. As the minutes went by, her leg began to swell and the realization that, at least for some time, she would no longer be able to do her usual activities caused a surge of anxiety and dread. Was this to be the end of her independence? What would her children have to say about this?

Mary's neighbors did, indeed, hear her call for help and stayed with her until the ambulance arrived. Her children were concerned and supportive. Her two daughters packed the items she would need and made sure her house was secured before taking her to Lexington to recuperate. Over the next few months, Mary's sleep patterns improved and she found comfort in having a loved one so close nearby. Beginning with her slip on the back steps and continuing through her relocation and recovery, Mary was continually re-appraising her situation by trying to determine how these events would affect her health, physical function, and independence. Physiologically, a cascade of neuroendocrine reactions were taking place. Adrenalin was causing her heart to race while her immune system was sending cytokines to the site of injury. Over the course of the next day following the injury, levels of cortisol (a "stress" hormone) were rising. The cortisol was acting at sites throughout the body to stimulate release of stored sugar for energy, directing the flow and activity of her immune system, and minimizing the level of inflammation near the break in the bone. Such endocrine responses were not, however, limited to the immediate physical trauma.

Mary was unable to stay in her home alone while her leg was healing and none of her children could afford the time to come to her home and stay with her for an extended period. Mary's daughter brought her to Lexington to live with her during her

recuperation. When Mary's leg was strong enough, they toured three senior housing facilities in Lexington. Of all the facilities they visited, Christian Community impressed Mary the most. She was able to tour the apartments, observe an exercise class, partake of a meal in the dining room, and visit with the current residents. She was immediately drawn to Helen and Francine, women who had also recently lost a spouse. They told her of the new quilting group that was meeting on Tuesday evenings. Mary and her daughter both attended two quilting nights at Christian Community and by summer's end, Mary had signed a lease for a two-bedroom apartment.

Mary and her daughter made several visits to Christian Community before the move-in date. They took paint buckets and brushes with them the week before the move and painted an accent wall in the living area. Mary used the accent wall to highlight the quilt her mother had made her as a wedding gift, along with her favorite photographs of her family through the years. The kitchen, which Mary found to be rather small and dark, was brightened by a mirror resembling a window. Her daughter hung small curtains around the mirror to make it look "cozy."

Several trips to Cincinnati were made to sort through the contents of her long-time home and pack the items Mary might need for her new apartment. Deciding what to bring with her, and how to arrange her apartment so the furniture not only fit but looked nice, was more challenging than she had anticipated. Many pieces of furniture, including antiques from both her and George's parents, were reminders of happy times and significant events in her life and marriage. She struggled with the decisions of what to keep and what to pass on. Given that her children were spread across the country, it was difficult to distribute these items. Her oldest son didn't want to pay to move the pieces of furniture Mary had selected for him and asked her just to sell them and send him the money. A rivalry among the children erupted, and Mary found herself slipping into a depression. She couldn't sell the house without it being emptied of its contents and the expense of her apartment and the house was draining her financially.

Three months after Mary moved into her apartment, her children moved the remainder of belongings to a storage unit and put the house up for sale. It took six weeks for the house to attract a serious buyer and Mary was both relieved and disheartened by

the resulting sale of her house. It was a blessing to her finances, but a sad reminder of all that she had lost. Her children were still bickering and they were calling her less often than before the move. The worry over her house and money, coupled with the arguments among her children and the slow recovery from her injury were taking their toll on Mary's health. She wasn't sleeping well at night and her lack of exercise contributed to a 20lb weight gain. In her fourth month in her new residence, Mary received bad news from her physician: She had developed diabetes. His recommendations included significant dietary modifications, increased physical activity (i.e. daily walks), and to reduce her stress levels since stress tends to exacerbate the disease.

Six months after her move to Christian Community, Mary had become more socially active in the resident activities on her floor. She was in charge of decorating the common area at Christmas, using many bright and sentimental ornaments and decorations contributed from all the residents. She had become fast friends with a couple of other residents, visited with her daughter weekly, and had personalized her apartment so that it reflected her unique personality. She was learning to manage her diabetes with the assistance of the dietary staff and other women who had been managing diabetes for many years. Social support from her peers, finding a new church, and frequent contact with her daughter were the best aspects of her life at Christian Community. While the many life changes had taken their toll on Mary's physical well-being, she was finding ways to manage the stress. Keeping busy, staying connected to others, and prayer – previously used and trusted coping strategies – were still working for her.

A visit to Christian Community today might find Mary leading an informal dance class, counseling new residents on how to best decorate apartments and make the most of limited space, or conspiring with her friend, Helen, on how to effectively “roast” the activities director at the upcoming holiday dinner. Regardless of what Mary might be doing, she would appear to represent a model of contentment, happiness, and health for older women. So too would her friend Helen, who spent her childhood in an orphanage, suffered through two abusive marriages before settling into a healthy marriage, and moved constantly between the households of three children before finally being placed in Christian Community. Mary and Helen seem to have adjusted well. Have they adjusted

in a similar way? Will their ways of adjusting result in similar health trajectories in the coming years?

CHAPTER ONE:
AGING, RELOCATION, STRESS, AND ADAPTATION

Introduction and Purpose of the Study. Mary's story is typical for many older adults in the United States. Older women tend to live longer than men and often serve as the primary caregivers for their spouse (Federal Interagency Forum on Aging-Related Statistics, 2004). The decision to relocate or to age in place can be a difficult one, mitigated by a variety of influencing factors including finances, physical abilities and social and instrumental support from family. Research has examined the reasons older adults relocate, the decision-making processes, and the influence of life history and life course factors (such as retirement). Research has not thoroughly examined the stresses associated with relocation and the adaptation to a new home. Chronic stress is known to cause or exacerbate chronic health conditions and has implications for older adults experiencing significant life transitions.

Greater understanding of the holistic process of adaptation to relocation among older adults is important for researchers, practitioners, and facility staff. Understanding the many stresses and stress responses – from endocrine through interpersonal scales -- associated with leaving one's home and community, dispersing household and sentimental possessions in preparation for the move, and adapting to the physical and social climate of a new residence will assist facility administrators and staff in guiding prospective residents through the transition. Increases in the array of potential housing types (including assisted living, senior housing, and continuing care retirement communities) allows older adults more freedom from responsibility (home maintenance, cooking, cleaning) and provides opportunity for greater interaction with peers. It will be important to understand the process of relocation decision making, moving, and adaptation in order to facilitate successful development and operation of assisted living facilities as future generations age and such housing options for older adults

become more plentiful. Integration of the psychosocial and physiological contributing factors to relocation stress and subsequent adaptation will provide a more complete perspective on the process.

Relocation. Residential relocation is a process in which the individual changes his or her living environment and is usually a response to a major life change, such as accepting a new job or the addition of a new family member. For older adults, this decision may be the result of the loss of a spouse, a decline in income, or change in health status (Oswald & Rowles, in press). Lee (1966) and Lawton (1977, 1983) identify “push-pull” factors in the decision to relocate. Some events, such as an inability to maintain the current residence or changes in the neighborhood, *push* the individual toward relocation while the availability of amenities and desirable features of a new home *pull* them toward a new one. Person-environment fit theories postulate that older adults relocate in response to declining physical abilities and need for more supportive environments (Scheidt & Windley, 1985). Regardless of the reasons for the move, the transition entails some degree of stress and requires adaptation. Prior research has tied relocation stress to negative physical and psychological outcomes, as well as increased mortality (Lawton, 1977; Lawton & Yaffe, 1970; Carp, 1977; Aldrich & Mendkoff, 1963; Lieberman, 1991; Pastalan, 1983). Other research on relocation in a sample of older women found that those who used more problem-focused rather than emotion-based coping strategies showed increases in well-being following the move (Kling, Seltzer, & Ryff, 1997). Recent research has led to more comprehensive theories and conceptual frameworks about the relocation adaptation process. Golant (1998) proposed an ‘Interactional Worldview’ model that incorporates the temporal context and whole person perspective. In this model, individual qualities that influence how a person evaluates and interacts with the environment (such as personality, behavioral competence, cognitive appraisals, and life experience) in conjunction with the temporal context of the

relocation (i.e. antecedents, consequences, and life patterns) yield better prediction of adaptation to the new environment.

Migration involved not just the permanent relocation of people, but a change in housing and the characteristics and situations of the new housing, as compared to the prior housing, form a large part of the adaptation process. With advancing age, there is an increasing probability of greater dissimilarity between origin and destination housing. Elders are more likely than younger adults to move into congregate housing, for example, that reduce the physical demands of maintaining an independent home or that provide some degree of personal care.

Housing Alternatives. A relatively new development in senior housing trends is the emergence of assisted living facilities. Bridging the gap between independent living and nursing home care, assisted living provides residents with their own private apartment and supplemental assistance with activities of daily living as needed. Meals, housekeeping services, and medication monitoring are typical services offered. The majority of residents in assisted living are widowed or single women, with an average age of eighty years (<http://www.alfa.org/>). Residents may be affluent or low income, depending on the location and type of facility, and facilities are owned and operated by private corporations or not-for-profit agencies. Sizes of assisted living residences range from small family-type dwellings to large, more traditional facilities.

In a study of 2,078 assisted living residents across four states and a variety of residence types (i.e. <16 beds; traditional, and new-model large-scale facilities), demographic profiles were very similar: older (average age 75), Caucasian women, who were primarily widowed or single and moved to assisted living from their own homes in the community (Morgan, Gruber-Baldini, & Magaziner, 2001). Educational levels were diverse, ranging from grade school through college. In this sample, the most common types of assistance provided to the residents included bathing, dressing, and personal hygiene. Smaller facilities had higher percentages of residents experiencing

cognitive impairments and behavioral problems. The traditional and new-model facility residents were less physically and mentally impaired.

Stress. Widespread use of the term "stress" in popular culture has made this word a very ambiguous term to describe the ways in which the body copes with psychosocial, environmental, and physical challenges (McEwen & Seeman, 1999). Historically, research on stress has included an array of perspectives including the general adaptation syndrome (Selye, 1936), the 'fight or flight' response (Cannon, 1939), significant life events (Holmes & Rahe, 1967), daily hassles (Kanner, Coyne, Schaefer, & Lazarus, 1981), and coping/appraisal (Lazarus & Folkman, 1984).

The study of stress has long been defined and studied within the dichotomy of psychosocial or biomedical paradigms. Stress is typically understood to be any thing or event that is deemed to be dangerous or threatening to an individuals' mental, emotional, or physical well-being (Wheaton, 1997; Pearlin, 1983; Kasl, 1984). When encountering such circumstances, we begin a process of continual cognitive appraisal and reappraisal of the situation and direct our efforts toward managing and resolving the threat (Lazarus & Folkman, 1984). It is well understood that in the face of physical or psychological danger, the body undergoes a cascade of physiological reactions resulting from activation of the sympathetic nervous system.

Physiology of stress. From a physiological perspective, the perception of danger activates the Hypothalamic-Pituitary-Adrenal (HPA) Axis, which results in secretion of corticotropin releasing hormone (CRH). The CRH stimulates release of ACTH from the anterior pituitary gland into the blood stream. ACTH then stimulates the adrenal glands, resulting in activation of "stress" hormones -- cortisol and other glucocorticoid hormones -- that affect various tissues throughout the body, including the brain, cardiovascular, and musculoskeletal systems, in order to prepare for mobilization to deal with the stress (Hadley,

2000). In general, stress hormones, particularly the glucocorticoids, have protective effects in the short term. One of their primary roles is to promote the conversion of stored protein and fat to carbohydrate sources in order to provide energy after a period of physical activity (e.g. escaping from danger). In addition, they increase appetite in order to control energy storage and use (McEwen, 2000a). However, in the face of chronic, unabating mental stress, glucocorticoids impair insulin regulation and result in increased deposition of body fat. The interaction among stress hormones also promotes fatty build up in the arteries that increase the risk of cardiovascular disease (Brindley & Rolland, 1989).

Psychosocial stress. Physiological stress reaction processes can be tempered by individual psychosocial characteristics such as personality, temperament, and life course experience as well as social support and life events (Burg & Seeman, 1994; Grant, Brown, Harris, McDonald, Patterson, & Trimble, 1989; Mroczek & Almeida, 2004; Roy, Steptoe, & Kirschbaum, 1998). Psychology has often looked at stress from the perspectives of appraisal, coping styles and abilities, and social support (Lazarus & Folkman, 1984; Pearlin, Menaghan, Lieberman, & Mullan, 1981). Early research combined fragmented concepts (such as sources, mediators, and manifestations of stress) into a process of identifying, enduring, and resolving the stress through coping strategies and behaviors, and related such coping to subsequent outcomes in terms of mortality, depression, and disease (Calabrese, Kling, & Gold, 1987; Pearlin et al., 1981). The attempt to understand the long term implications of stress within an interdisciplinary framework has resulted in an alternative view.

Toward an Allostatic Perspective. A holistic view of the adaptation process to a new living environment would include both physiological and psychosocial dimensions of the phenomenon. Included would be basic measures of physiological arousal, cognitive appraisal, a history of life stresses, prior

coping strategies, personality, environmental influences, and behavioral responses. The most comprehensive model is that of allostasis and allostatic load (Sterling & Eyer, 1988; McEwen, 2000a).

The combination of psychological and physiological theories and frameworks has yielded a new interdisciplinary science termed Behavioral Endocrinology (BE) (Beach, 1975; 1981). One of the most promising conceptual frameworks, BE which successfully combines the terminology, theories, and methods of both physiological and psychosocial processes in regard to stress, is termed Allostasis (Sterling & Eyer, 1988). Essentially allostasis is process of establishing stability through change: it necessitates an integrated study of both the physiological and psychological mechanisms of managing stress. If allostasis is achieved, the individual's 'fight or flight' reaction is ameliorated and his/her cognitive perception of the situation becomes congruent with his/her beliefs. If the individual is unable to achieve homeostasis, a state of allostatic load results in illness or mortality.

Significance. Given the general physical declines that accompany the aging process, the implications of successful adaptation to significant life stresses, such as residential relocation, are important. These implications affect the older person's family (need for care), finances (in home care, insurance), and society (care facilities, Medicare and Medicaid). Understanding what promotes successful adaptation to stress is central to developing appropriate interventions, support systems, and policies.

Adults face a number of stressful life events and transitions during the course of the aging process. Residential relocation may be particularly stressful due to the need to adapt to a new physical and social environment while psychologically adjusting to the loss of previous social ties, community, and a well established "home" (Rowles & Chaudhury, 2005). The initial decision to relocate may also be associated with other life transitions including declines in

health and physical ability, the death of a spouse, relocation of adult children out of the area (e.g., leaving home for the first time), and the loss of social networks. Extant literature on relocation among older adults has focused primarily on decision making and migration patterns (Haas & Serow, 1993; Litwak & Longino, 1987; Longino & Fox, 1995; McHugh & Mings, 1996; Rowles & Watkins, 1993). Research focusing on perceptions of the move, the new residence, and subsequent adaptation has been more limited (Cuba, 1991). Research on stress has been primarily divided by discipline, with biological and psychosocial conceptual frameworks and theories designed to investigate more discipline-specific phenomena. It is well established that human beings have a universal physiological reaction to stressful encounters, typified by a 'fight or flight' response involving a cascade of neuroendocrine communications. Prolonged stress is known to increase susceptibility to disease processes and increase mortality (McEwen, 2000a; Sterling & Eyer, 1988). Psychosocial literature shows that underlying personality characteristics, social support, prior experience, and problem-solving abilities contribute to and modify the reactions to stressful events (Cutrona, Russell, & Rose, 1986; Golant, 1998; Kling, Seltzer, & Ryff, 1997).

Specific Aims.

In attempting to reconcile these dual perspectives, the specific aims of this study are to:

1. investigate anticipated, experienced, and interpreted stresses associated with residential relocation for older women;
2. examine the relationships between psychosocial and physiological manifestations of stress adaptation; and
3. test a model combining biological and psychosocial research perspectives and methods in the investigation of residential relocation stress.

The study design is longitudinal, with participants interviewed at three time points during the first six months in their new residence: 1) within one month of the move, 2) three months post-move, and 3) at six months post move. Semi-structured research interviews were conducted in the participants' homes and saliva samples, used to assess levels of stress hormone, were collected monthly over the six month time period.

This dissertation proceeds with literature reviews on relocation among older adults (Chapter Two) and psychosocial and physiological stress and adaptation (Chapter Three). Methods for data collection are detailed in Chapter Four with copies of the research interviews included in the appendices. Key findings are presented in Chapters Five and Six. The Discussion and Implications of these findings comprise Chapter Seven. An epilogue follows the Discussion and includes information on my experiences conducting a mixed method study - rewards and challenges – and the next steps for future research.

CHAPTER TWO:
RESIDENTIAL RELOCATION AND AGING

Overview. This chapter will consider background literature on extant theories and research related to residential relocation, migration, and housing as it relates to older adults in the United States. The push-pull model of elder relocation (Lee, 1966), the stage theory of migration (Litwak & Longino, 1987), and a life course model (Elder, 1995) are the primary theoretical models presented and used to frame the research questions posed.

Americans change residences an average of 10.44 times during the course of their adult lives. Each move tends to bring substantial changes in living environment, family dynamics, community integration, and social networks. For most, relocation and acclimation to a new home and community is a stressful experience. Depending upon one's perception of the stress, whether it be considered a challenge (affording opportunity for personal growth) or a threat (resulting in potential harm or loss), different attempts are made to moderate stress and adapt to the myriad of changes (Lazarus & Folkman, 1984). Reasons for relocating vary by age and timing of life events and can be seen as part of the natural progression of the life course (Elder, 1995; Moen, 2001).

Concepts of Relocation. Two conceptual frameworks are typically used to guide research on late-life migration: the push-pull model (Lee, 1966) and the life-course approach (Elder, 1995; Moen, 1995). While the literature uses one or the other to test hypotheses and describe aspects of elder relocation, this dissertation incorporates the push-pull dynamics within the broader framework of the life course model.

During childhood and adolescence, residential moves are typically the result of parental decisions associated with progress along career-paths. After high school, the next move is typically to college or to an apartment after securing a job. U.S. Bureau of the Census (2000) data indicate that in the

previous decade the majority of all residential moves (56%) were made by young adults between the ages of 20 and 30. During this stage of the life course, individuals are going to college, graduating, and beginning both careers and families (likely explaining the relocation of 21% of children under the age of 4) (Oldakowski & Roseman, 1986). Approximately another one-third of all moves are made by those aged 30 to 45 years. The percentages dwindle to less than ten percent for each subsequently older age group. Life stage changes, such as career moves and children leaving the home, can be the key impetus for relocating at midlife (Robison & Moen, 2000). This trend of tapering relocation is typical and has been reported in the research literature (Robison & Moen, 2000; Rossi, 1980).

Most older adults report a desire to “age in place” (AARP, 1996) and many find it easier to adjust to a home with too much living space than too little (Rossi, 1980). Between the ages of 55 and 65, the gross migration rate (GMR) is nearly 2, indicating two more moves. By the age of 65, the GMR is one which would likely be interpreted as a move to a nursing home. With the advent of senior housing retirement communities, assisted living facilities, and continuing care retirement communities, the options are more plentiful and decidedly more appealing.

Roughly 6% of those at retirement age (55 to 64) have relocated (U.S. Bureau of the Census, 2003). While the national percentage of those moving is relatively small, the actual number of moves is quite large. Of those who have moved, one-third relocated out of state. Glasgow (1980) reported similar results with 5% of retirement age adults making a residential move. She also found that the retirement move is typically amenities-related and to a community in which the older adult had previous ties, and possibly reflecting that retirees no longer need to live where they once worked (Walters, 2002). Amenity movers tend to be married, college-educated homeowners with relatively high incomes (Robison & Moen, 2000; Walters 2002). Such retirees are often in good health and have

strong social networks of family and friends (Litwak & Longino, 1987; Stoller & Longino, 2001). Nearly 46% of all retired movers report amenity motivations (Walters, 2002). Along with the amenity moving trend, movers often relocate to the 'sunbelt' states (Longino & Fox, 1995; Longino, 1990; Rogers, 1988) and the literature reports older adults tend to relocate to communities similar in size to the ones they left (U.S. Bureau of the Census, 1996). There is a growing pattern of movement to regional retirement centers, including northern Michigan, Cape Cod, and the Ozarks (Rowles & Watkins, 1993).

The Census Bureau (1996) also reported that only 1% of adults over the age of 65 relocated out of state. Rogers and Watkins (1987) found that Florida, California, and New York were the key states involved in interstate transfer of elder migrants. The census data indicate that 1% to 3% of adults age 65 and older relocate out of state. Research on return migration has led to the development of a three stage model of elder migration, which includes an initial amenity move, followed by a return necessitated by declines in physical health and functional abilities, and the possibility of a third move to the homes of kin or nursing care (Litwak & Longino, 1987; Longino, 2001; Longino, Jackson, Zimmerman, & Bradsher, 1991; Miller, Longino, Anderson, James, & Worley, 1999). Of those aged 85 and older who have moved, 69% are moving locally, which is consistent with the third stage of this migration theory. Walters (2002) found that those migrating for assistance with health care needs tend to seek the lowest cost options in areas of similar amenities and place characteristics reported by amenity movers. Severely disabled seniors who were not married tended to relocate to the nearest available facility. Similar findings have been reported in previous research (Longino & Smith, 1998; Speare, Avery, & Lawton, 1991).

Data from the 2000 census is remarkably consistent with extant literature going back at least 40 years with regard to the numbers and percentages, as well as trends with regard to elder relocation. Two primary models have been

employed to study and lend understanding to retirement or elder migration and were used to frame the questions asked of participants in this dissertation. Lee (1966) and proponents of his push-pull model proposed that older adults relocate when social and environment factors hinder the ability to live in their own home any longer and pull factors, in the form of needed or desired amenities, pull them in the direction of a new residence. Research indicates that these phenomena occur within a specific context. In general, older adults who are more frail in health and do not have kin caregivers will relocate to more supportive environments. Within the subpopulation of adults over 65, those who are more affluent often choose to relocate to areas with attractive amenities. Research has documented specific patterns of movement (migration streams) for these populations, with three distinct stages: move toward amenities, move toward assistance/kin, and move to supportive care.

A second approach to investigating relocation adapts the life-course model, which incorporates the whole of life experience and spatio-temporal context, in seeking to understand relocation decision-making and behavior. If one's early life experiences, career trajectory, and family dispersion patterns facilitate a lifetime of travel and frequent residential transitions, one may be more likely to make an amenity move upon retirement or pack their belongings into an RV and travel the country. On the other hand, if one's life experience was deeply rooted in a single community with historical and economic significance, relocation may be considered only a remote possibility and even then, only under dire circumstances. It is conceivable that the two models are symbiotic. The push-pull model appears to be useful in specific cases where life circumstances and economic conditions allow for such moves to be possible. These individuals comprise a small percentage of the older population and tell an even smaller portion of a story about life-course aging, as extant literature attests. It is also conceivable that the affluent migrants, being more highly educated, are more inclined to participate in research studies. The percentages in

the literature so closely match the census data that the former assertion is most likely.

We have some understanding of the sociodemographic characteristics and life events surrounding relocation, including the role of education, career, and retirement. Another significant question that arises is this: What are the essential reasons given for a move and how do movers fare? According to the U.S. Census, one-third to one-half of those who relocate cite housing related reasons, including (but not limited to) desire to own a home, better home, better neighborhood, and cheaper housing. Housing-related reasons were more prevalent among those moving within counties. A quarter to a third mentioned family-related reasons such as changes in marital status and establishment of one's own household, events that are considered major life-course events. Similarly, between six percent and nearly one-third report work or career related reasons, including new jobs, searching for employment, easier commutes, and retirement. Work-related reasons were mentioned more frequently among those moving out of county. Ten percent or less reported other reasons such as attending college, change of climate, and health conditions. Of these reasons, it is reasonable to expect health reasons, retirement, and changes in marital status to be significant life course factors influencing older adults' relocation decisions, while cheaper housing and better neighborhoods would be pull factors toward new homes.

Haas & Serow (1993) postulate that older adults experience vicarious thoughts or daydream about moving, which precede the formal process of decision-making (Longino, 1992, 2001). In the process, push-pull factors and life transitions (such as retirement, death of a spouse) become more apparent. Kallan (1993) further expanded this model to include contextual factors and multi-level interactions. The findings indicate the role of area characteristics (climate, cost of living and crime rates) varies among subgroups of the older population.

Additionally, those who leave an area tend to move toward lower-cost & lower crime areas, particularly homeowners and those moving to be closer to family.

Robison & Moen (2000) propose a model with four categories of explanatory factors affecting older people's expectations regarding future mobility and anticipated living arrangements: background characteristics, housing history, social integration, and health. Using a life-course model and the four categories of explanatory variables, key findings were that women, ethnic minorities, and those who were integrated into their communities were more likely to anticipate aging in place and making structural modifications to their homes in order to enable them to do so. Roughly one-third (28%) expressed certainty about moving from their homes at some point in the future and rate moving into some form of congregate housing (or senior housing facility) about a 30% likelihood.

Another study of residential relocation of seniors moving to congregate settings (senior apartments and continuing care retirement communities) inquired about the reasons for leaving home and the considerations deemed to be important in a new home (Krout & Moen, 2000). Primary reasons for moving were: anticipation of future needs, cost of upkeep and maintenance of current home, and to avoid dependency on others. The main considerations in the selection of a new residence were: continuing care options, location near friends and relatives, freedom from home maintenance, and proximity to services and recreation (Krout, Holmes, Erickson, & Wolle, 2003). Both of the aforementioned studies were in a semi-rural location where several types of housing options were available. Both samples were well educated and both samples had given fore-thought and considerable planning to their relocation decisions, consistent with Kallan's (1993) model.

An underlying motif of this research is that older adults desire to maintain independence as long as possible. The vast majority do not relocate and research on moving decisions supports this finding with most reporting intentions to age

in place. The small percentage who do relocate or migrate, are highly educated, more likely to have substantial incomes, and are likely to plan for such a move in advance. Retirement and other significant life events are often turning points and coincide with migration patterns. The two main perspectives for studying elder migration, the push-pull model and life-course model, appear to be nested designs. If the life course is a panoramic view of one's life, with earlier experiences influencing decisions and trajectories, the push-pull model and its offshoots can be seen as a telescopic view into a specific segment of the life-course, with a caveat that it may encompass only a select portion of the population of elders.

Types of Senior Housing. The senior housing industry has experienced a great deal of growth in the last decade. Naturally occurring retirement communities (NORCs), or communities in which the majority of the population do not relocate but subsequently age in place, have been studied in both rural and urban environments (Hunt, Merrill, & Gilker, 1994; Marshall & Hunt, 1999; Pine & Pine, 2002). The number of high-rise apartments designed specifically for older adults and those with disabilities grew in the 1980's. This option provides residents with a community of peers with whom to enjoy both scheduled and resident-instituted recreational activities, meals, and transportation services (Cedrone, 2000; Feinstein, 1996; Krout & Wethington, 2003). Independent-living and assisted living apartments, both small and large scale, are often operated by county government agencies, not-for-profit organizations, and private corporations. These newer facilities combine service delivery with more private apartment accommodations, allowing older adults to live independently longer.

A relatively new development in senior housing is the emergence of assisted living facilities. Bridging the gap between independent living and nursing home care, assisted living facilities provide residents with private apartments and supplemental assistance as needed with activities of daily living.

Meals, housekeeping services, and medication monitoring are the typical services offered. The majority of residents in assisted living are widowed or single women, with an average age of eighty (<http://www.alfa.org/>). Residents may be affluent or low income, depending on the location and type of facility. Facilities are owned and operated by private corporations or not-for-profit agencies. Sizes of assisted living residences range from small family-type dwellings to large, more traditional facilities.

While assisted living facilities are new, Continuing Care Retirement Communities (CCRC) are newer and the epitome of housing and service delivery provision for older adults. With levels of care ranging from private condominium patio homes, to apartments, assisted living, and skilled nursing facilities on one campus, residents are often assured that they will be cared for until their death (Hays, Galanos, Plamer, McQuoid, & Flint, 2001). Such facilities provide a wealth of services, including housekeeping, meals, transportation, and maintenance (Cluskey, 2001). Rehabilitation services, physical therapy, and nursing may be found in the skilled nursing facilities. Recreational activities and facilities, often coupled with preventive health programs, are often part of the facility (Resnick, 2001). Privately owned, for-profit agencies often require a substantial sum of money prior to entry into the community and typically serve as the long-term care insurance. Faith-based not-for-profit campuses are often not as expensive, but may not provide as extensive a range of services and recreational opportunities (Sherwood, Ruchlin, Sherwood, & Morris, 1997).

Reasons for relocating to a CCRC include anticipation of future needs and desire for continued care, freedom from upkeep and maintenance of a current residence, and the desire not to be burdensome to family (Krout, Moen, Holmes, Oggins, & Bowen, 2002). Those who plan for relocation to a CCRC tend to have greater satisfaction with their new homes post-move (Moen & Erickson, 2001; Prawitz & Wozniak, 2005). As many as fifty CCRC's have been or are being built on or near University campuses (Bowdon, 2006). These facilities provide

residents the opportunity to engage in recreational and cultural activities sponsored by the university. Attractive to faculty and alumni, such facilities can be found in upstate New York, North Carolina, Michigan, California, and Ohio and are likely to continue to appear in communities across the U.S. (Krout & Wethington, 2003; Thompson, 2003; Bowdon, 2006). Ward, Spitze, & Sherman (2005) found that interest in such accommodations was highest among those with faculty status, those expressing dissatisfaction with their current residential situation, those with clear retirement plans, and those with an interest in university activities.

Congregate Housing and Health. Relocation can be a highly stressful event in the lives of all people, but the reasons for moving given by older adults are often the results of multiple experienced stresses or anticipated stresses, including loss of a spouse, change in income, as well as decline or anticipated decline in health and physical abilities (Krout, Moen, Holmes, Oggins, & Bowen, 2002). Relocation to congregate housing, such as senior apartments or assisted living, can be stressful for a number of reasons. Movers must adapt to a new, unfamiliar physical environment, new social settings (i.e. group dining), and increased frequency of contact with friends and neighbors. Given what is known about the effects of chronic stress on physical and mental functioning, the adaptation process to a new home can be categorized as a chronic stress. Other research has shown that the duration of the psychosocial adaptation process for older adults moving to a continuing care retirement community was about 3 years (Krout & Moen, 2000). Waldron, Gitelson, & Kelly (2005) found that men who had relocated to a retirement community reported gains in support and practical assistance four years post-relocation whereas women reported losses in support or no changes at all. Meiselman (2003) found that reasons for relocation, planning, and coping styles affected adjustment to relocation.

Where a person lives may also be a factor in health status. For example, researchers have found that older adults living in rural areas generally suffer

from more chronic conditions and have more functional limitations than their urban counterparts (Coward & Krout, 1998). Research has also shown that these health differences cannot simply be explained by variation in the characteristics of rural and urban elders such as age, gender, race, and income (Gillanders, Buss, & Hofstetter, 1996). Thus, factors related to where an older person lives such as life style patterns including exercise and diet, availability of health services, and types of employment can be expected to influence health status. We can also speculate that the type of housing an older person lives in may affect health. Housing that does not match functional abilities (for those with impairments such as mobility difficulties) exposes older adults to environmental stresses (Lawton & Nahemow, 1973). Congregate housing that includes services such as meals provided under the supervision of a nutritionist or has safety features such as call bells or ADA compliant bathroom fixtures may both prevent and/or delay health conditions or disease from becoming disabling and help in their management.

Summary. The majority of older adults prefer to remain independent and desire to age in place in communities that hold significant meaning for them. In the past, housing options for seniors were limited primarily to sun-belt retirement villages and nursing homes. With the advent of a multitude of new senior housing options, often in desirable locations and with a wide range of amenities, it is expected that more seniors will consider such options, especially when seeking to maximize their independence and reduce the caregiving burden they perceive themselves as placing on family. Studies on reasons for relocation, decision-making, and adaptation to a new home have provided insights into the demographic characteristics of seniors most likely to undertake a move in late life. Understanding the course and process of successful adaptation to a new living environment is an under researched, yet important topic. This study aims to identify anticipated and experienced stresses of women making a transition to

senior housing, with an emphasis on identifying factors that contribute to successful adaptation and well-being. The next chapter focuses on the physiological and psychosocial reactions to stress and the relationships among perceptions, coping strategies, and subsequent adaptation.

CHAPTER THREE:
PHYSIOLOGICAL AND PSYCHOSOCIAL STRESS

Defining and Conceptualizing Stress. Stress has been defined quite differently by researchers based on the vocabulary and knowledge within the discipline in which it is being observed and studied. Some of the early researchers were physicians and physiologists who identified patterns of illness and body damage in patients experiencing multiple demands on their bodies and minds. Hans Selye, a physician, observed that many of his patients had enlarged adrenal glands, shrunken lymph nodes, and bleeding ulcers. It was Selye who identified the general adaptation syndrome, a non-specific adaptation that occurs in response to stress and sets forth a cascade of physiological change in the endocrine and other organ systems (Selye, 1936). The general adaptation system outlines a three-stage process (alarm, resistance, exhaustion) by which a person responds to stressful conditions (Drew, 1999). He stated that there is a cumulative effect of stress and that the sum of all nonspecific systemic reactions of the body to long-continued exposure to systemic stress and under extreme, unrelenting stress, the outcome is certain death.

Walter Cannon, an American physiologist, elucidated the role of the autonomic nervous system in response to external stimuli, creating the concept of the 'fight or flight' response. He also pioneered some of the early work on the role of the endocrine system on biological reactions. Cannon showed how adrenal hormones allowed bodies to meet the demands of emergencies. In 1931 he discovered "sympathin", an adrenaline like substance released from the synapses of nerve cells. In essence, the body attempts to supply the organs and tissues what they will need to mobilize in the face of a physical danger. He formulated the Homeostasis Theory which states that the body acts to maintain a stable internal environment through the interaction of various physiological processes (Cannon, 1939). Cannon said of the body, "the

coordinated physiological processes which maintain most of the steady states in the organism are so complex and so peculiar to living beings – involving as they may, the brain and nerves, the heart, lungs, kidneys and spleen, all working cooperatively that I have suggested a specific designation for these states, homeostasis.”

Other researchers observed that stress responses occurred in the face of threats other than physical dangers. Many responses arise from psychological stresses or situations in which the individual is required to modify their behavior, thoughts, and/or attitudes. These changes, biological or psychological, are known as “coping behaviors.” They facilitate adaptation to the stressor. Holmes and Rahe (1967) developed a rating scale consisting of social stresses faced by adults. The greater the adjustment required, the higher the score for each item. They found that the more events an individual had experienced, the more likely they were to succumb to a physical illness within the year. Similar to the maladies reported by Selye and the hormonal responses seen by Cannon, the experience of social stresses results in similar disease outcomes.

Lazarus and Folkman (1984) put forth their theory of “stress and coping” via the transactional model of stress. This is a psychological model based on the cognitive factors and reasoning processes that occur when an individual is facing a stressful situation. It accounts for an individual's perception and appraisal of a stressor and also his/her subsequent efforts to manage the stress. Lazarus and Folkman identify two types of appraisal processes: primary appraisal and secondary appraisal. Primary appraisal is the initial evaluation of whether the event will have an impact, i.e. (is it relevant, what are the potential outcomes, how much adjustment will it require). The degree to which the event is deemed stressful can be determined by the appraisal. It could be perceived as a potential harm/loss, threat, or challenge. The benefit of a threatening situation is that it allows for anticipatory coping. For instance, a woman whose spouse is suffering from a terminal illness may appraise this situation as a threat because at some

point her husband will succumb to the illness. However, the situation allows her to prepare for the loss. Challenging situations can also be perceived as threatening and allow for an individual to seek coping resources and afford an opportunity for growth and development. Challenges afford a foundation upon which further coping processes can build.

Biology of Stress. Human reactions to events deemed to be stressful elicit varied psychological and behavioral responses, but fairly uniform physiological reactions. One of the primary physiological reactions is the activation of the hypothalamic-pituitary-adrenal axis, a complex interconnected endocrine system that includes the brain (specifically the hypothalamus and pituitary glands) and peripheral glands (specifically the adrenals located near the kidneys). The primary hormone implicated in instances of activation of the hypothalamic-pituitary-adrenal (HPA) axis is cortisol. Receptors for cortisol are located throughout the body, and it has effects on glucose production, fat metabolism, inflammatory responses, vascular responsiveness, and central nervous system and immune functioning (Stone, Schwartz, Smyth, Kirshbaum, Cohen, Hellhammer, & Grossman, 2001). The HPA axis and its primary messenger (cortisol) are implicated in both psychiatric and somatic diseases such as depression, post-traumatic stress disorder, hypertension, sexual dysfunction, immunosuppression, hyperlipidemia, and several others (Chrousos & Gold, 1998; McEwen, 1998; Stone, et. al, 2001).

The body's ability to precisely control the chemistry and organ systems of the body is based on set points and regulatory feedback systems. The most common feedback system is a negative feedback loop that operates much like a thermostat and furnace, with the thermostat (pituitary gland) set to keep endogenous hormones circulating at requisite levels. Levels exceeding the set point cause the hypothalamic-pituitary axis to signal the adrenal glands to slow down production whereas levels below the set point elicit the hypothalamic-

pituitary axis to signal for increased production. In terms of the hormones involved in the stress response, the hypothalamus secretes corticotrophic releasing hormone (CRH) through a portal vein that runs from the hypothalamus to the pituitary, and would be likened to the person responsible for setting the thermostat or determining the set point. CRH stimulates the release of adrenocorticotrophic hormone (ACTH) from the pituitary. ACTH is detected by receptors on the adrenal glands which in turn secrete cortisol. All of these hormones are secreted in a diurnal pattern. The pacemaker for this diurnal rhythm appears to be the suprachiasmatic nucleus of the hypothalamus.

The activation of the HPA axis begins with the perception of the stressor: it involves activation of the hypothalamic pathway which results in secretion of CRH. The CRH stimulates release of ACTH from the anterior pituitary gland into the blood stream. ACTH then stimulates the adrenal glands, resulting in synthesis and secretion of cortisol and other glucocorticoid hormones which affect various tissues throughout the body in order to prepare for mobilization to deal with the stress (Hadley, 2000).

Cortisol, along with other HPA hormones, has a well-documented circadian rhythm in patterns of secretion with peaks occurring in the morning and gradually declining throughout the day. Superimposed on the circadian rhythm, corticotropin releasing hormone (CRH), adrenocorticotrophic hormone (ACTH), and cortisol are secreted in pulsatile bursts with a very clear on-off pattern. The pattern repeats 10 to 15 times every 24 hours with the strongest burst in the early morning hours (Stone, et. al, 2001). It is resistant to changes in pattern due to environmental lighting routines, and appears to be set by the age of 3 months (Hadley, 2000).

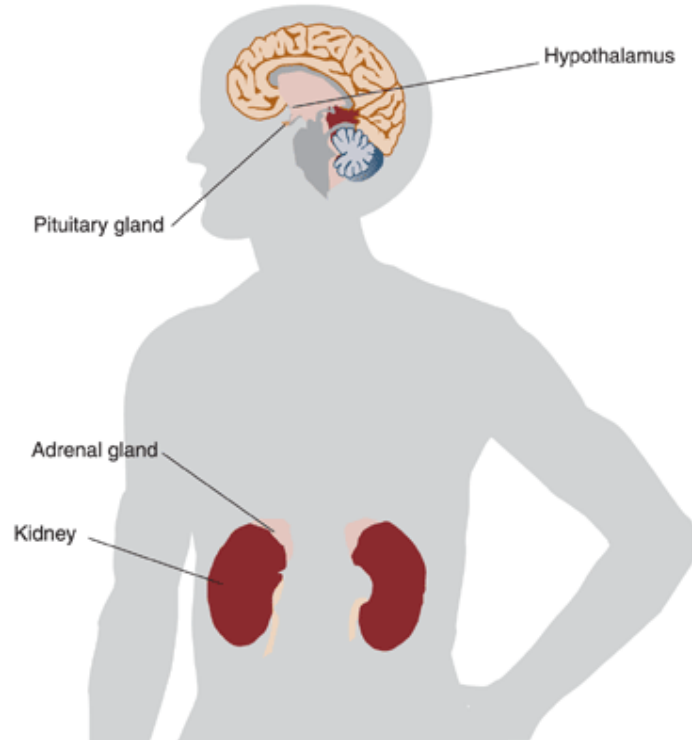


Figure 3.1: HPA Axis

The adrenal gland manufactures glucocorticoid hormones, and other steroid hormones, mostly from stored cholesterol esters and some from cholesterol gleaned from the bloodstream. Cortisol is released into the bloodstream and transported to target tissues by plasma proteins. Within the plasma cortisol are two proteins, corticosteroid-binding globulin (CBG) and alpha-2 globulin (Hadley, 2000). Approximately 6% of circulating cortisol is unbound and represents the amount available to bind with target tissues. The bound hormone, which is easily unbound when needed, is essentially the “storage”. When testing for levels of cortisol in the blood, both the bound and free levels can be detected, allowing the researcher to see not only how much is being produced, but also how much is immediately available for use.

In the event that HPA axis activation does not shut off, the body compensates in several ways. One of the most common, and most detrimental to

the brain, is known as down-regulation (or decrease in the number) of specific hormone receptors at target sites. The glucocorticoid hormone, cortisol, passes through the plasma membrane into the cytoplasm where it binds to the specific, high-affinity glucocorticoid receptor (GR). GR in the unstimulated state is bound to other proteins and hormone binding initiates release of protein binding which allows dimerized glucocorticoid receptors entry into the nucleus. This results in gene transcription at the level of the DNA (Muller, Holsboer, & Keck, 2002). The process is similar to turning on a switch. The sequela of events within the target cells require energy and resources within the cell. In the event that the cell is repeatedly stimulated, the cell is not able to recover from the preceding stimulations or continue to receive and process additional stimulation of glucocorticoids. Ultimately, this damages the target cell and it catabolizes the cortisol receptors. This process makes it less receptive to cortisol and the end result is shrinkage of the cell and atrophy of the tissues. Given that the hippocampus is rich in cortisol receptors and highly responsive to the stress process, atrophy of the tissue yields noticeable deficits in memory and functioning.

Stress Hormones. In general, stress hormones, particularly the glucocorticoids, have protective effects in the short term. They dampen the immune system to prevent excessive inflammation of tissues, regulate hormones responsible for cardiovascular reactivity to stress, and act as a buffer for cells exposed to excess insulin (Ullrich, Berchtold, Ranta, Seeohm, Henke, Lupescu, Mack, Chao, Su, Nitschke, Alexander, Friedrich, Wulff, Kuhl, & Lang, 2005). Another immediate and primary role during a period of stress is facilitation of conversion of stored protein and fat to carbohydrate sources in order to provide energy after a period of physical activity (i.e. escaping from danger). Similarly, GCs increase appetite in order to control energy storage and use (McEwen, 2000a). In the face of chronic, unabating mental stress, glucocorticoids impair insulin regulation and result in increased deposition of body fat. The interaction

of the two hormones also promotes fatty build up in the arteries, which leads to cardiovascular disease (Brindley & Rolland, 1989).

Other stress-related hormones are produced by the adrenal medulla and include the catecholamines: epinephrine (adrenaline) and norepinephrine (noradrenaline). The catecholamines are secreted into the blood stream by the adrenal medulla as hormones and also from sympathetic nerve endings as neurotransmitters. Levels of catecholamines change rapidly depending on the type of stress and generally, their half-life is approximately three minutes, thus rendering them useless in studies of chronic stress. They are responsible for the classic “fight-or-flight” response described by Cannon. Timing of the measurement of these circulating hormones is essential. Urinary measures of the metabolites of the catecholamines can also be obtained and yield a useful estimate of the degree of sympathetic arousal over a longer period of time, typically 24 hours (Baum & Grunberg, 1995; Hubbard, Kalimi, & Liberti, 1998). Some metabolites of cortisol can also be detected and assessed using radioimmunoassay techniques. However, the majority of the corticosteroids are metabolized in the liver.

The physiological role of cortisol and the other glucocorticoid hormones is largely permissive, meaning that they allow other hormone systems to work properly. They are essential to the functioning of the sympathoadrenal system. If the glucocorticoids were not present under conditions of stress, the individual would suffer cardiovascular collapse and death. They are required for synthesis of the catecholamines within nerve terminals and the reuptake and enzymatic degradation processes. They also play a role in carbohydrate, lipid, and protein metabolism; fat mobilization; parturition; neuronal development; anti-inflammatory responses; and immunosuppression (Hadley, 2000; Orchinik, Murry, & Moore, 1991).

Stress hormones, the brain, and memory. Given that the hormones of the HPA system are responsible for control of the homeostatic mechanisms, it is

imperative to understand the brain regions most sensitive to these chemical messengers. The brain is responsible for coordination not only of our autonomic responses, but also our cognitive processes of interpreting and responding to environmental stimuli. In acute stress, elevation in the glucocorticoids facilitates memory formation and events associated with strong emotions (McEwen, 2000b; McGaugh, 2000; Roozendall, 2000). Glucocorticoids and catecholamine hormones along with adrenaline play an important role in activating the amygdala, along with the hippocampus in situations of strong emotion and the result is often intense, clear memories of the event (McEwen, 2000a). This type of memory formation has been termed “flash bulb” memory within the field of psychology. A series of experiments by Beylin & Shors (2003) illustrated that the glucocorticoids were necessary for memory formation and learning during a stressful test, but without continued circulating levels, the learning dependent on memory did not last. This may be due to the type of receptor responsible for receiving the signal. Mineralocorticoid (type I) receptors and stress-related glucocorticoid receptors (type II) may have different membrane fluidity and responses, whereas rapid effects initiate fast responses, nuclear receptors may require more persistent stimulation (Reul & de Kloet, 1985, Beylin & Shors, 2003).

Chronic stress resulting in continuous elevations in glucocorticoids leads to impaired cognitive functions and promotes damage to the brain, the hippocampus in particular (Lupien & McEwen, 1997). The hippocampus is most important for declarative memory and spatial learning, and is most vulnerable and highly sensitive to the adrenal stress hormones (DeKloet, Vreugdenhil, Oitzl, & Joels, 1998; McEwen, 2002). The hippocampus experiences remarkable change in response to environmental stimuli and the aging process itself. Progressive changes occur over time in the hippocampal regulation of calcium, plasticity in response to stress hormones, and the expression of neurochemical markers indicative of neuroprotection and damage (McEwen, 2002).

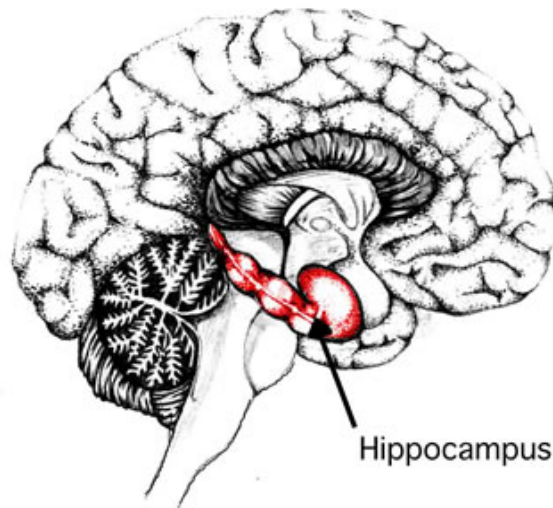


Figure 3.2: Location of the Hippocampus

The brain is remarkably plastic, even in adults. Resilience is demonstrated through several neurochemical responses to environmental and endocrine input. Neurogenesis can be stimulated by exercise, enriched environments, and estrogen. Dendritic remodeling in the face of repeated stresses allows connections to be maintained in the face of damage (Conrad, Magarinos, LeDoux, & McEwen, 1999; Gould, 1999; Kempermann, Kuhn, & Gage, 1997; McEwen, 1999; van Praag, Kempermann, & Gage, 1999.) The brain is able to retain considerable resilience in the face of stress, particularly in women (McEwen, 2002). One of the ways women's brains are protected from the deleterious effects of chronic stress is through estrogen by moderating the effects of stress hormones and regulating synapse formation in the hippocampus. Additionally, the hippocampus is affected by stress hormones in two other ways: (1) repeated stress remodels dendrites in the CA3 region of the hippocampus and (2) under chronic stress neurogenesis is suppressed by stress hormones in conjunction with excitatory amino acids and NMDA receptors with both of the latter implicated in programmed cell death (McEwen, 2002). While estrogen has a protective effect, women past menopause face increased vulnerability. HPA

activity increases in women as they age as a result of natural shifts in diurnal rhythms (VanCauter, Leproult, & Kupfer, 1996). Older women also showed greater HPA reactivity (stress hormones) during a laboratory stress test compared to men (Seeman, Singer, Wilkinson, & McEwen, 2001). The implications of these findings may be tempered by use of hormone replacement therapy.

In older adults, memory impairments and hippocampal shrinkage have been demonstrated in longitudinal studies. Healthy older adults were followed over a four-year period and those whose cortisol levels were increasingly elevated in successive years had higher basal cortisol levels in the fourth year, demonstrated explicit memory and selective attention deficits, and an MRI showed that their hippocampi were 14% smaller than age-matched controls with lower basal cortisol levels (Lupien, DeLeon, De Santi, Convit, Tarshish, Nair, McEwen, Hauger, & Meaney, 1998; Lupien, Lecours, Lussier, Schwartz, Nair, Meaney, 1994).

Stress hormones and the immune system. Under normal situations of acute stress, the immune system is mobilized as part of the body's natural defense system. In the event of a 'fight or flight' encounter, the immune system is prepared to fight infection and enhance wound healing (Bulloch, 2000; McEwen, 2000b). The human immune system is composed of two different components: the humoral and cellular components. The humoral component is dominated by B-lymphocytes which produce immunoglobins whose primary function is to defend against viruses and bacterial invasions. The cellular division contains (a) helper t-lymphocytes which stimulate the B-lymphocytes when an invader is identified, (b) suppressor t-lymphocytes which dampen the t-helper cells, and (c) natural killer cells which attack virus-infected and cancer cells. The lymphocytes release cytokines, the chemical regulators of the immune system (Hubbard, et. al, 1998). Acute stress increases white blood cells in preparation to fight infection.

Chronic stress suppresses natural killer cells and activity of the lymphocytes (Kiecolt-Glaser & Glaser, 1991).

The immune system is regulated from input from multiple neural and endocrine pathways including sensory neurons, autonomic neural pathways, and circulating hormones (mainly glucocorticoids). Elevations in glucocorticoids and catecholamines (the “stress hormones”) serve to direct the flow and concentrations of the varied cells within the immune system (Bulloch, 2000). In situations of chronic stress, the stress hormones suppress the immune response and slow the immune cell trafficking. Severely impaired immune functioning, to the point of auto-immune disease, is more common in females (DaSilva, 1999; Lahita, 1997; Wilder, 1998). Research has shown that similar levels of salivary free cortisol can be seen in both men and women prior to a mental stress task. After administration of the stress test, differences were seen in glucocorticoid sensitivity of proinflammatory cytokine production which supported previous literature on women’s different immune reaction (Rohleder, Schommer, Hellhammer, Engel, Kirschbaum, 2001).

While the physiological stress response follows a distinct pattern of hormone release and feedback, the psychological perceptions and interpretations of events which trigger these responses are varied. The psychological experience of a stress is appraised and reappraised continually as behavioral attempts to manage or eliminate the stress are employed. Theories framing stress from a psychosocial perspective are presented in the next section.

Psychology of Stress. Psychology has long emphasized the variability among individuals in ability, thought, attitudes, personality, temperament, and behavioral responses. These differences have been attributed to nature (genetics) and nurture (environment, life experience, learning) (Dowling, 2004; Lippa, 2005). The classic definition of stress is a situation that requires an individual to adapt (Workman, 1998). Stressors are seen as threats, challenges, or losses (Lazarus & Folkman, 1984). Psychologists used three primary models to study

stress: environmental, psychological, and biological. The environmental model was built upon the work of a physician named Meyer who employed a “life chart”, which denoted significant life events, in making medical diagnoses (Meyer, 1951). Other measurement tools were developed through the years: Schedule of Recent Experiences, Structured Event Narrative, Life Events and Difficulties Schedule (Baird, 1983; Fischer, 1976; Harris, 1987, 1991; Holmes & Rahe, 1967) and some continue to be used today, such as the Social Readjustment Rating Scale (Holmes & Rahe, 1967).

Psychological models emphasize the role of cognitive and emotional processes mediating stress and are largely built upon the work of Lazarus (Workman, 1998). Many of the measurement tools based upon this model were specifically designed for a specific purpose within a specific study (Moos & Schaefer, 1993). Included among these tools are the Stress Appraisal Measure, Impact of Event Scale, Perceived Stress Scale, and the Stress/ Arousal Adjective Checklist (Cohen, 1988; Horowitz, Field, & Classen, 1993; King, Burrows, & Stanley, 1983). The biological model of stress measurement is based upon scientific objective and not the subjectivity of the other two models. The biological model within the psychology framework has recently included stress hormone measures, along with measures of cardiovascular reactivity (i.e. heart rate and blood pressure) and observable behaviors indicative of stress (Lovallo 2005; Lerner, Gonzalez, Dahl, Hariri, & Taylor, 2005; van Eekelen, Houtveen, & Kerkhof, 2004).

Early life events have been shown to affect the reactivity of the HPA axis and modulate the pattern of activation and deactivation of the system in both human and animal models (Caldji, Liew, Sharma, Diorio, Francis, Meaney, & Plotsky, 2000; McEwen, 2000b). Animal models have shown that prenatal stress of an unpredictable nature increases emotionality and increases reactivity of the HPA axis and autonomic nervous system (ANS) and the effects last the duration

of the lifespan (McEwen, 2002; Weinstock, Polytyrev, Schorer-Apelbaum, Men, & McCarty, 1998). Early handling of newborn animals leads to lower HPA reactivity and slower rates of brain aging. However, prenatal and postnatal stresses increase activation of the HPA axis, as does prolonged maternal separation (Plotsky & Meaney, 1993; Dellu, Mayo, Ballec, LeMoal, & Simon, 1994; McEwen & Seeman, 2003).

Similar studies in humans have yet to be established. However, low birth weight and early life trauma appear to affect HPA activity, as does maternal diabetes during pregnancy (Barker, 1997; McEwen & Seeman, 2003). Sexual and physical childhood abuse are both shown to be factors for post-traumatic stress disorder (PTSD) and hippocampal atrophy (Bremner, Randall, Vermetten, Staib, Bronen, Mazure, Capelli, McCarthy, Innis, & Charney, 1997). Experiments with animal models have shown that there is a hypersensitivity to glucocorticoids in PTSD whereas depression seems to be the result of down regulation and decreased sensitivity (Liberzon, Krstov, & Young, 1997). Depression involves other brain regions, specifically the amygdala which also has a role in stimulating CRH and cortisol release via indirect, disinhibitory connections to the hypothalamic paraventricular neurons (Beaulieu et al, 1987; Drevets, Price, Bardgett, Reich, Todd, & Raichle, 2002; McEwen, 1995; Herman & Cullinan, 1997). Child abuse and neglect have also been shown to be risk factors for other indicators of allostatic load in adult life such as obesity, cardiovascular disease, and depression (Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, Koss, & Marks, 1998; McEwen & Seeman, 2003).

Taylor, Lerner, Sherman, Sage, & McDowell (2003) looked at relationships between self-enhancement, or false positive views of one's abilities and/or health status, and biological reactivity to stress. In a laboratory stress test, those who were high 'self-enhancers' showed lower cardiovascular responses to stress, had more rapid cardiovascular recovery, and lower basal cortisol levels. Positive

perceptions appear to help in managing stressful situations and those who are higher in self-enhancement may experience less chronic toll in their stress regulatory systems.

Integrative Theories and Approaches

Allostasis and Allostatic Load. Sterling & Eyer (1988) introduced the concept of allostasis, the body's ability to maintain stability (homeostasis) through change or promote adaptation and physiological coping. In assessing physiological changes in homeostasis in response to stress, they found individual variability in circadian rhythms (blood pressure and heart rate in particular) and subsequent adjustments in the basic set point. Allostasis describes not just changes in the set point, but also the homeostasis of the HPA (hypothalamic pituitary adrenal) axis, the immune system, and the autonomic nervous system. These three systems have been found to maintain and coordinate the mechanisms responsible for homeostasis (McEwen, 2000b; McEwen, 2002).

There are hidden costs of chronic stress to the overall well-being of the human body over long periods of time. These hidden costs can be considered a predisposing factor for the effects of acute, stressful life events. Glucocorticoids and catecholamines, the primary hormonal mediators of the stress response, in concert with cytokines from the immune system, have effects on tissues and organs throughout the body in order to elicit adaptive responses. In the short run, these hormones are essential for adaptation, maintenance of homeostasis, and survival. However, when the system is overactive, as in chronic stress, the system does not effectively terminate and the result is damage to the body or accelerated disease processes. An allostatic state is the elevated or dysregulated activity of the circulating hormones and tissue mediators that result in the cumulative damage to the body as it repeatedly adapts to demands. This damage or cumulative cost is termed "allostatic load". (McEwen, 2000a; McEwen, 2003; McEwen, 2002).

The theory of allostasis includes a model to illustrate how individual differences in susceptibility to stress are tied to individual behavioral responses to environmental challenges that are coupled to physiologic and pathophysiologic responses (McEwen & Stellar, 1993). There are three mechanisms by which allostatic load may occur: (1) frequent overstimulation by frequent stress resulting in excessive stress hormone exposure; (2) failure to turn off allostatic responses when they are not needed or inability to habituate to the same stressor, both of which result in over-exposure to stress hormones; and (3) inability to turn on allostatic responses when needed, in which case other systems (e.g. inflammatory cytokines) become hyperactive and produce other types of wear and tear (Schulkin, Gold, & McEwen, 1998).

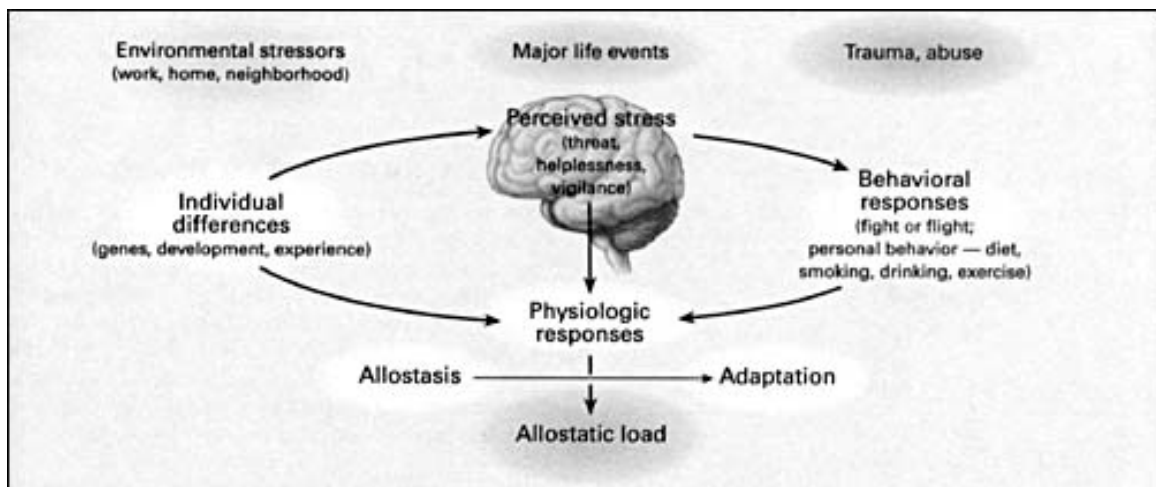


Figure 3.3: Model of Allostasis and Allostatic Load

Allostatic load has been measured and tested in several studies, using both animal and human models. One of the best supporting studies used the MacArthur Successful Aging Study which allowed researchers to look at physiological activity across many regulatory systems, including the HPA axis, as well as the sympathetic nervous and cardiovascular systems, and other metabolic processes. The results yielded two measures of allostatic load: (1) higher, chronic, steady levels of activity related to diurnal variation and (2)

residual activity reflecting the effects of chronic stress and/or the failure of the on-off mechanism (McEwen 2000a; Seeman, McEwen, Singer, Albert, & Rowe, 1997). Measures used to assess allostatic load were: blood pressure, cardiovascular reactivity measures, waist-hip ratio, adipose tissue distribution, cholesterol, blood plasma levels of glycosylated hemoglobin, serum levels of DHEA-S (dihydroepiandrosterone sulfate), extended measures of glucose metabolism, over-night urinary cortisol excretion, over-night noradrenaline and adrenaline secretions, integrated indices of 12-hr sympathetic nervous system activity, and an integrated measure of 12-hr HPA axis activity. Measures have been subsequently categorized into four primary mediators (cortisol, DHEA, adrenaline, and noradrenaline) leading to primary effects (cellular events, enzyme activation, second messenger system activation) and secondary outcomes (blood pressure, fat deposition, glucose metabolism), and finally tertiary outcomes (disease or mortality). Intervening factors, namely behavioral and psychological reactions, can accelerate or ameliorate the damage and/or disease process. For example, hostility hastens disease, whereas cooperation tends to protect. Alcohol consumption, dietary intake, and other behaviors can tilt the balance in either direction as well, depending on how they are managed.

Additional research on confirming and validating the model of allostatic states and load includes organization and categorization of the components measured and the cascade of reactions resulting from the beginning of allostasis to the culmination of allostatic load (McEwen & Seeman, 2003). Other related systems, such as the cardiovascular and immune systems, need to be studied in more depth in order to better identify secondary outcomes, or organ specific targets of allostatic states. Existing research on the immune system yields some direction on integrated measures of immune enhancement and suppression to help determine the impact on cellular function and differentiate between immuno-enhancing effects of acute and immunosuppressing effects of chronic

stress (Dhabhar & McEwen, 1999, 1996; Kiecolt-Glaser, Glaser, Gravenstein, Malarkey, & Sheridan, 1996; McEwen & Seeman, 2003).

Building on the framework set forth in the fields of biology and biomedicine, in which energy input and expenditure are the primary processes being balanced, McEwen and Wingfield (2003) have added the psychosocial mediators of social conflict and other types of social dysfunction to the model. They outline two different types of allostatic load. Type 1 overload entails sufficient or excess energy consumption occurring with social conflict in which the animal or person enters survival mode in effort to decrease the load and re-establish balance. Type 2 overload is mostly seen in human populations or animals living in colonies. The overload triggers changes in social structure and a learning rather than escape mode.

Aging, Life Events, and Stress. Throughout the course of life, numerous changes occur in all aspects of life. In childhood, there is a period of rapid physical and intellectual growth, the beginning of formal education, formation of peer groups and beginnings of social bondings. Adolescence and young adulthood is a time of increased independence from family, establishment of a personal identity, college education and/or career development, as well as the beginning of one's own family. Middle adulthood is marked with career transitions, children maturing and leaving the home, and retirement planning. Many begin formal caregiving for parents or in-laws whose health is declining. Older adulthood may include changes in health, functional declines, health declines in spouses, widowhood, death of friends, and relocation. However, it may also afford a more effective ability to handle stress, depending on previous life experiences.

Significant life events require adaptation to changes in environment, lifestyle, and social context. Changes can occur in behavior or perception and have direct effects on the physiological regulatory systems. This dissertation focuses on a particular life event: relocation among older women. Relocation

entails not just a change in where one lives, but also in patterns of social interactions, engagement in the community, and daily lifestyle habits (such as eating and sleeping patterns). The decision to relocate may be influenced by other significant life events, such as the death of a spouse, change in financial status, need or desire to live in closer proximity to children, and changes in health or functional ability. Reactions to relocation can be mixed. For example, it can be a physical and financial relief to no longer have to maintain a house while eliciting grief responses to losing a home which holds memories of happy times and the comfortable, familiar community surrounding it. Leaving one's home may also evoke fears of losing independence and freedom or it may appear as a wonderful opportunity for social contact with peers.

The next chapter details the study design and measures used to investigate relocation decision making, perceptions of the move, stresses associated with the move, coping strategies, well-being, and adjustment to the new residence.

CHAPTER FOUR:
THE RESEARCH STUDY

Overview. This study focuses on the stresses of residential relocation to independent and assisted living facilities among older women living in the Commonwealth of Kentucky. Participation entailed three semi-structured interviews as well as saliva blood sampling over a 6 month period of time, beginning within one month of the move. The interviews contained questions about sleep patterns and quality; recent life events; medical diagnoses and treatments; dietary habits and recent changes; reasons for, planning, and expectations of the move; history of residential relocations; frequency of contact with family, friends, and neighbors; social support networks; lifestyle activities; demographics; measures of positive and negative affect; perceived control; and coping strategies (see appendices B-D). The raw data was entered into SPSS using the Data Entry Builder software. The data were cleaned and a codebook constructed. Once all data were collected and cleaned, syntax for scoring scales was run. Reliability analyses were included, and initial syntax constructed for factor analyses of coping behavior items.

Research Design. Participants were recruited primarily through facility managers, who provided incoming residents with information about the study. The names and contact information of prospective residents who indicated an interest and who agreed to be contacted, were passed on to me for follow up. Additionally, managers allowed flyers to be posted in common areas of their building. New residents could then contact me directly.

Study Sites. Managers of senior housing facilities in Lexington, Wilmore, Frankfort, Nicholasville, and Louisville, Kentucky were contacted about the study soon after IRB approval. Fifteen facilities were contacted and of those, six had waitlists, five were at capacity, nine were seeking to fill apartments. Four

declined to participate for a variety of reasons, including time commitments of staff, regulations and restrictions of parent companies, and resident governance policies regarding solicitations. Seven facilities in the aforementioned cities agreed to participate. Managers and/or marketing directors provided information about the study to prospective and new residents. The names and contact information of interested prospects were passed on to me for follow up.

Two facilities, one in Lexington and one in Frankfort, were exclusively assisted living facilities (ALF). In one ALF, residents had their own apartments with small kitchenettes, a separate bedroom, and a private bath. Meals were served in a common dining room and were prepared by food service personnel. The other ALF, much smaller in scale, was set up more like a family home. There was a common kitchen and dining room and meals were prepared by a single staff member. Residents had private bedrooms, shared baths, and one common living area. Another two facilities had both independent living and assisted living apartments available within the same building. Services were delivered discretely to those in need, a mix of onsite (facility based) and offsite (community service) care provisions. Dining services were provided in both facilities and each apartment had a full kitchen, a private bath, and at least one bedroom. Two church-affiliated facilities which agreed to participate were set up with continuum of care housing options, including private cottage/condominium accommodations, independent and assisted living apartments, and skilled nursing facilities. One such facility was located in a rural area just outside of Lexington, while the other was located in the city of Louisville.

Two facilities in Lexington were HUD subsidized with rents based on a sliding scale fee schedule. The majority of residents were local residents with lower socioeconomic status (SES) and education levels. Onsite services were limited, but outside service providers were available by contract for residents in need of assistance.

Excluded sites. Two facilities in Lexington were excluded for various reasons. One facility spent up to two years talking with residents, providing additional resources (such as connections with area realtors for assistance in selling their homes), and facilitating resident connections with prospective residents prior to relocation. Another facility, which catered to more affluent seniors, had an extensive waitlist and had all apartments filled. Resident turnover was slow and therefore, this facility was not considered for inclusion. Two other facilities, one in Lexington and another in Frankfort, were managed by the same corporate office. After reviewing the project materials, they declined to participate due to a corporate policy that does not allow management to be an intermediary when subjects are financially compensated for participation in research studies.

Sample. The sample is comprised of older women who had recently moved to independent senior housing or assisted living in central Kentucky. This dissertation looks at 15 women who completed the protocol in 2005. Participants were interviewed at three time points beginning within one month of their relocation and then in the third and sixth month post move. The expectation was that by the third month, participants would be familiar with their new surroundings yet still be acclimating to the social atmosphere of the facility. By the sixth month, participants should be socially acclimated and integration with peer groups should be beginning. While six months may not be enough to fully adapt to the new environment, it was expected that there should be evidence of congruence of pre-move anticipated stresses and experienced stresses, coping strategies, and social integration.

Procedures. Facility administrators sent an introductory letter and information about the study to women on the waitlist for an apartment. The names and contact information of women expressing an interest were forwarded to me. I then contacted the participants to tell them more about the study, answer any questions, and set up the initial interview. The first semi-structured

research interview was conducted in the participants' residences within one month of their relocation. Interviews were also conducted three and six months after the move.

At the conclusion of the first interview, the participants were given six salivettes and instruction sheets on how to collect saliva specimens for cortisol analysis. Saliva was collected at six time points over a 24-hour period: just after waking, an hour after waking, between 1-3pm, between 4-6 pm, between 7-9 pm, and at bedtime. I returned to collect the salivettes within a day after the saliva collection. In the months between the first and third interview, participants collected two samples once a month: within one hour of waking and at bedtime, in order to assess the peak and nadir cortisol levels. At the third interview, participants again collected six samples in one day in order to assess the shape of their cortisol curve.

Measures. Physiological and psychosocial indices of stress were taken at each of the interviews. The physiological measures include salivary cortisol levels taken once a month for six months (as described above). An array of psychosocial measures discussed in the following chapters include:

Positive and Negative Affect Scales (Mroczek & Kolarz, 1998) yield scores indicative of levels of happiness and stability in mood. The scales were developed as part of the MacArthur Foundation Research Network on Successful Midlife Development (Brim, Ryff, & Kessler, 2004). Relationships between age and affect supported life span theories of emotion, indicating that personality, contextual factors, and sociodemographic variables were all needed to understand age-affect relationships. Alpha reliabilities for positive (.91) and negative (.87) affect were high. These scales were used as measures of emotional well-being following the move.

Proactive Coping Inventory (Greenglass, Schwarzer, & Tauber, 1999) yields scores on a variety of subscales related to aspects of active, problem-focused coping. The title of the scale given to pilot test participants was the Reactions to Daily Events Questionnaire. However, in this project, the items were imbedded in the research interview. Individuals scoring high on the Proactive Coping Inventory (PCI) are seen as having beliefs that are rich in potential for change particularly in ways that would result in improvement of oneself and one's environment. The scale has high internal consistency as seen in reliability measures of .85 and .80 in the two preliminary test samples. In addition the scale shows good item-total correlations. The authors report that principal component analysis confirmed its factorial validity and homogeneity.

Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) was designed for use with community samples with at least a junior high school education. The items are easy to understand and the response alternatives are simple to grasp. Moreover, the questions are quite general in nature and hence relatively free of content specific to any sub population group. The results showed the Perceived Stress Scale (PSS) had adequate reliability with both a 14-item and 4-item versions of the scale. Eskin & Parr (1996) reported reliability estimates of .84.

Coding. Many items in the interview were open-ended, allowing for qualitative responses and explanations. While the interviews were not tape-recorded and transcribed, detailed comments were written and quotations noted during each interview. These comments and quotations were entered into an SPSS database and then converted into codes based on frequency of similar responses. Specifically, questions relating to the decision to move, amenities attracting participants to their new home, perceived and anticipated stresses associated with the relocation, and the influence of others on the decision to move were left open-ended (see Appendix B, Housing and Relocation Section).

The Perceived Stress Scale, Proactive Coping Inventory, and Positive & Negative Affect Scales consisted of a series of statements with participants rating their level of agreement on a likert scale. Items were entered in the database and reverse scoring was computed on the raw items per the scoring instructions (Cohen, Kamarck, & Mermelstein, 1983; Greenglass, Schwarzer, & Tauber, 1999; Mroczek & Kolarz, 1998).

In addition to the PCI, questions about general coping behaviors were coded as dummy variables with yes/no answer choices. If participants indicated they engaged in a coping behavior, they were asked to rate the general effectiveness (Very, Somewhat, Not at All) of the behavior in alleviating stress. Participants were also asked to name additional behaviors they used for stress release and these were coded and added to the database.

Given that there are generally considerable changes in social contact, activity participation, and community involvement as a result of residential relocation, participants were asked if they had expected changes in these domains and what type of change was expected. In the Time 2 (T2) and Time 3 (T3) interviews, they were asked whether they had experienced changes and if so, what type of change. The data were coded as dummy variables: Yes/No for expected or experienced changes and Increase/Decrease for amount of change (see Interview Schedules in Appendices B,C,&D).

Participants were asked about significant life events, both preceding their move (T1) and after relocation (T2 and T3). Open-ended items regarding the most stressful events and best aspects of life were asked at each of the interviews and recorded monthly at the time saliva samples were received. At each of the monthly meetings for saliva pick-up, participants completed a two-page survey regarding sleep and eating patterns, quality and quantity of sleep on the date of saliva collection, times of each specimen collection, and medication changes. Additional information about life events, significant medical problems, and any other important information was written on the bottom of the form either by the

participant or myself. These data were entered into the database along with the cortisol values from the saliva specimens in order to correlate life events with the cortisol levels at each collection point.

Saliva specimens were taken to the Core Laboratory of the University of Kentucky General Clinical Research Center (UKGCRC). The salivettes were centrifuged, aliquotted, and frozen until analysis. Saliva samples were analyzed in duplicate using ELISA assay techniques with results reported in mcg/dL. The data were transformed from mcg/dL into nmol/L and entered into the SPSS database.

Analysis. Data were entered into SPSS software, cleaned, and analyzed. Descriptive statistics were run on the qualitative items (e.g. reasons for relocation, reasons for selecting the specific facility) and the responses were coded by content. Psychosocial scales, the proactive coping inventory and the positive and negative affect scales, were computed based on the recommended scoring instructions. Measures of central tendency, range, and standard deviations were computed for each scale score. Frequencies were run on the common health conditions and conditions for which physician care was currently provided. Time since diagnosis was computed. Each coping strategy was rated on its effectiveness. Means and standard deviations were computed for the effectiveness of each coping strategy. Self-rated health, energy, and pain levels were included in a correlation matrix with the scale scores, number of health conditions, activity of daily living (ADL) limitations, and number of coping strategies used. Anticipated and experienced lifestyle changes were coded in dummy variable format. Frequencies were computed for each of the data collection periods.

Participant comments were recorded in the interview schedules and were compiled into a document by the time of data collection (e.g. Month 1, Month 3, and Month 6). Comments are incorporated into the findings section. Cortisol

measures were recorded in Microsoft Excel, cleaned, and used to construct graphs. The data were also entered into the SPSS database and used in analyses.

The next chapter presents the results of the study. The results are presented in two segments: the first reports information about participants gathered during the interviews completed within a month of the move and the initial diurnal cortisol curves and the second considers changes in health, well-being, lifestyle, stress perceptions, and cortisol reactivity over time.

CHAPTER FIVE

FINDINGS

Overview. This project was designed to understand anticipated and experienced stresses associated with relocation to senior housing among older women. The specific aims were to investigate anticipated, experienced, and interpreted stresses associated with residential relocation for older women; examine relationships between psychosocial and physiological manifestations of stress adaptation; and develop a model combining biological and psychosocial research perspectives and methods in investigating residential relocation stress. This chapter presents findings from data on fifteen subjects interviewed between May 2005 and March 2006.

The findings presented include: demographic characteristics of the sample; reasons for relocation and expectations of the new home; life events preceding and following the move; perceptions of stress; coping techniques; health and well-being; comparisons of expected and anticipated lifestyle changes/stresses associated with relocation; physiological stress reactivity; relationships between stress and health; and adaptation and integration within the new home.

CROSS-SECTIONAL ANALYSES

Demographic Characteristics. The majority of women participating in this study were natives of the Commonwealth of Kentucky (79%). Among those who did not consider themselves natives, the average length of residence in the Commonwealth was 25 years. With an average age of 76 (± 11), the majority were widows (53%) and had children (87%). Thirteen-percent ($n=2$) were married and had been married an average of 57 years. The widows had been widowed an average of 11 years from marriages that were approximately 31 years in length. One-third ($n=5$) had been married only once and 27% ($n=4$) had been married twice. One-third ($n=5$) were divorced and one participant had

never married. Participants had an average of 3.5 children and only one had no children living within a 30-minute drive of the new residence. The women had changed residences an average of 8 (± 4) times in the course of their adult lives, since the age of 21 years.

The women were well-educated with five (33%) having a college or graduate level education. One participant had only a grade-school education while five (33%) had completed high-school and another four (27%) had taken some college courses. Over half of the sample, eight individuals (53%), continue to drive and do so an average of 19 (± 4) days per month. Of those who do not drive, reasons given included: health conditions (n=11, 71%), does not own a car (n=6, 57%), does not want to drive (n=5, 33%), lack of finances (n=1, 7%), never learned to drive (n=1, 7%), and a spouse drives (n=1, 7%).

Reasons for Relocation. Participants were asked their reasons for relocation, the factors influencing their decision to move, and the amenities which were most appealing in the new home. Participants could mention more than one reason and the reasons for relocation, or “push” factors fell into five categories: Health issues (n=6, 40%), encouraged by children (n=5, 33%), to be closer to a relative needing care (n=5, 33%), did not want to or could no longer live alone (n=3, 20%), and freedom from home maintenance (n=2, 13%). Participants heard about the facility through a variety of avenues. Many knew about the facility from living in the community where the facility was located (n=7, 47%) while others heard about it from their families (n=6, 40%) or friends (n=3, 20%). Others learned of the facility through nursing staff or social workers after an acute hospital or rehabilitation stay (n=2, 13%). Five (33%) of the women said the decision to relocate was their own while eight (53%) said their children were influential. One participant mentioned grandchildren and two (14%) mentioned spouses contributing to the decision as well.

Many participants chose their new residence because of the people associated with the facility, including staff members and the current residents

(47%). One participant commented that during her initial visit: *“It felt like a large extended family here.”* Others were attracted by amenities such as convenience and location (n=3, 20%), assistance/onsite care (n=3, 20%), and neighborhood appearance (n=3, 20%). The cost of rent and utilities was also mentioned by four women (27%) with all indicating how much they would be saving over their homes within the community. The option of residence in faith-based facilities operated or overseen by area churches was also seen as important by two of the women (13%). The answers reflect the strongest “pull” factors toward their new homes.

Seven of the women (47%) believed that companionship was going to be the best aspect of living in the facility, while four noted onsite services (27%), four location (27%), three maintaining independence (20%), two privacy (13%), and two the availability of activities (13%). In terms of the stresses associated with moving, downsizing and parting with personal possessions (40%) was the most frequently mentioned. Leaving their former communities and churches was a concern for four of the women (27%), as was living near so many other people for four of the women (27%). Selling the house while settling into the new home was worrisome for two participants (13%), as were health issues for either themselves or a relative (13%).

Participants were asked how they anticipated they would handle these stresses. Answers indicated a combination of both problem and emotion-focused strategies: five (33%) indicated they would continue to sort and disperse possessions with the assistance of family; four (27%) cited prayer; four (27%) socialization with others; two crying (13%); and two physical activity (13%).

Health and Well-Being. The women in the study all had good cognitive abilities as evidenced by their ability to complete the interview and saliva collection protocols. Physical health and abilities were diverse among the sample. Self-rated health and energy levels, self-reported health history, current diagnoses and ailments requiring physician care, in addition to ADL function

were included in the interview schedule. Participants self-rated their health on a ten-point Cantrell ladder, with an average rating of 5.8 (± 2.21) out of a possible ten. Self-assessed energy level was rated on the same scale with an average of 4.0 (± 2.54) indicating moderately low levels of energy. Higher scores on the physical function scale indicate poorer function. The average score was 17.85 (± 7.36) out of a maximum of 30. The most common functional difficulties were in engaging in vigorous activities (n=13, 87%), walking a mile (n= 12, 80%), walking uphill (n=10, 67%), climbing stairs (n=10, 67%), and engaging in moderate activities (n=9, 60%). The average length of time that participants had been dealing with functional impairments was 6 (± 4.4) years.

At the time of the move, participants reported an average of 6.5 (± 2.75) health conditions for which they were receiving treatment from a physician. Table 5.1 presents the most frequently mentioned health conditions.

Relationships between physical functioning and measures of psychosocial well-being were significant. In particular, poorer physical function was strongly related to both negative affect ($r = .72, p < .01$) and positive affect ($r = -.71, p < .01$). Self-assessed health was also negatively related to physical function ($r = -.58, p < .05$).

Table 5.1

Health Conditions for which Physician Care was Provided at the Time of the Move

Health Condition	Percentage Reporting	N	Mean Years since Diagnosis
Arthritis	80%	12	17.2
Hypertension	80%	12	17.0
Gastric Reflux	50%	8	3.0
Angina	47%	7	14.6
Thyroid Disease	35%	5	21.8
Stomach Trouble	35%	5	3.0
Heart Disease	33%	5	16.4
Diabetes	33%	5	16.8
Migraine Headaches	20%	3	29.3
COPD / Emphysema	20%	3	2.5
Broken Bones	14%	2	1.5
Cancer	14%	2	17.2

Life Events. Holmes and Rahe (1966) developed the Social Readjustment Scale which is comprised of a series of events that one may encounter in the course of an adult lifetime. Each event is one which requires adaptation to some degree, behavioral, biological, and/or psychological. A modified version of the scale, allowing for the collection of data on dates of occurrence and additional information, was used in the first interview. Participants had experienced an average of 9 (± 3) life events in the year preceding the move (See Table 5.2). Of these life events, participants were asked which had been the most stressful during the preceding year. Participants were allowed to mention more than one life event. Health issues (43%), moving and selling a residence (36%), health of a family member (28%), death of a spouse (21%), and other family issues (21%) were considered to be the most stressful. One participant commented,

“When my husband died, I could see it coming. I could prepare for his passing. This move has been one BIG nightmare. It has been worse than my husband’s death.”

Experienced life events were perceived quite differently among participants. Another recent widow commented,

“Moving hasn’t been my biggest stress. The loss of my spouse was the worst. I am still grieving. The first year is shock, the second year is grief.”

One-third of the sample (n=5) relocated to be nearer a relative needing care. For these women, family issues were considered to be more stressful than the move. These women were caring for a variety of family members, including parents, children, and spouses. One participant, who relocated to the same senior housing facility as her mother who was ailing with dementia, commented *“It’s been hard being a caregiver to my mother. I’ve become a parent to my own parent.”* Another caregiver, who had been in a caregiving role for several years, said *“My husband gets angry. He has dementia so it’s not really him anymore. My doctor says*

I'm holding up well for all I've been through." Other participants whose middle-aged children were severely ill and dying made the following comments, *"I moved here from the country. I had lived in Lexington for 84 years prior. I returned to Lexington for my daughter. She's in the nursing home dying of Huntington's chorea."* And *"My life has been stressed since my oldest son died and another son became ill. They both had brain cancer."*

Health issues were the most frequently mentioned stressors surrounding both the decision to move and the actual move. Over half of the participants (n=8) had experienced a significant injury or illness in the year preceding the move and of those, one-third (n=3) had not yet recovered. These health conditions varied in intensity and severity: they included back problems, pneumonia, lung disease, diabetes, broken bones, and suspected cancer.

- *"I've had trouble with my back. I've had traction and physical therapy. I've had many falls and a few broken bones."*
- *"Last December I believed I was having a heart attack, but it turned out to be my stomach. The chest x-ray showed a spot on my lung. It's now become a mass but they're not sure if it's cancer."*
- *"My friends disappeared when I got sick."*
- *"I moved here from a nursing home. I had lived here before that but I had to leave when I got pneumonia."*
- *"I stayed with family after my stay in the hospital and rehab nursing home. I spent two weeks with one daughter and two weeks with the other. This move just about did me in."*
- *"I'm not stable to walk. I've had two mini-strokes and I need help with everything – bathing, med management, shopping, banking, cleaning."*

Table 5.2

Significant Life Events Preceding the Move

Life Event	Percentage Reporting	N
Change in eating habits	73%	11
Change in health of family member	67%	10
Death of friends	67%	10
Change in social activities & recreation	60%	9
Change in financial status	60%	9
Personal illness or injury *	53%	8
Change in sleep patterns	53%	8
Change in church activities	47%	7
Change in number of family gatherings	47%	7
Death of family member	36%	5

* Two-thirds (63%) of those having experienced an illness or injury had recovered by the time of the first interview.

Coping Strategies and Proactive Coping. Individuals tend to cope with stress in ways that have been successful during previous encounters in comparable situations. Participants were asked whether or not they used various strategies when dealing with a stressful situation and were able to list additional methods not included in the list (See Appendix B for Interview Schedule). For those strategies which were indicated as being used, participants were asked to rate how successful each strategy was in ameliorating stress (See Table 5.3). Participants mentioned using a variety of both problem and emotion-focused coping strategies. Prayer, keeping busy, and finding humor were the most common, with prayer being rated as the most effective strategy in alleviating stress. Talking to a professional and reading were also rated as highly effective. Behaviors to distract oneself, such as reading, watching television, and listening to music were also used frequently and considered moderately effective. Least effective strategies were crying and eating or snacking, both emotion-focused strategies. The strategies rated as being most effective included prayer, talking to a professional, reading, listening to music, and finding humor. The majority of these are solitary activities and may allow the women more time at reflecting on the stress while contemplating ways of managing stress.

The Proactive Coping Inventory (PCI) yields scores on a variety of subscales related to aspects of active, problem-focused coping (Greenglass, Schwarzer, & Tauber, 1999). Individuals scoring high on the Proactive Coping subscale are seen as having beliefs that are rich in potential for change particularly in ways that would result in improvement of oneself and one's environment. The possible scores range from one to four, with the participants having a mean score of 2.56 ($\pm .63$). The lowest observed score was 1.62 and the highest was 3.62.

There were no significant relationships between the number of coping strategies used and scores on the PCI ($r=.14$, $p > .10$). Use of multiple coping strategies was related to better self-rated health ($r=.52$, $p \leq .05$). There was a

moderately strong positive relationship between positive affect and PCI scores ($r=.64$, $p=.02$) indicating that those who have more proactive coping beliefs also have more positive affect.

Table 5.3

Typical Coping Strategies and Perceived Effectiveness

Coping Strategy	Percentage (Number) Reporting	Mean Effectiveness Rating*
Prayer/Meditation	73% (11)	2.83
Keep Busy	73% (11)	2.27
Find Humor/Laugh	73% (11)	2.55
Reading	67% (10)	2.64
Watch TV	60% (9)	2.11
Talk to Family	53% (8)	2.13
Talk to Friends	53% (8)	2.38
Cry	33% (5)	1.33
Listen to Music	33% (5)	2.60
Church	33% (5)	2.20
Hobbies	33% (5)	2.20
Sleep	27% (4)	2.00
Talk to Professional	27% (4)	2.75
Eat/Snack	20% (3)	1.50
Avoid Stress	20% (3)	2.33
Withdraw/Be Alone	20% (3)	2.00

*Higher scores indicate greater effectiveness. Very = 3, Somewhat = 2; Not at All = 1

Anticipated Lifestyle Changes. Relocation inherently entails changes in environment, activities, and access to community resources. Relocation to congregate housing usually involves changes in social contact and activity participation. At the time of the first interview, participants were asked if they anticipated changes in recreational activity, social contacts and conflicts, diet, exercise, and sleep (See Appendix B for Interview Schedule). The majority anticipated significant lifestyle changes. These anticipated changes are presented in Table 5.4 along with the direction of expected change.

Most of the women expected increases in their contact with others, exercise, volunteer work, holiday celebrations, family gatherings, shopping, playing games, physician visits, and recreational activities. Driving, conflicts with others, church attendance were expected to decline, as was sleep and food consumption. Dietary changes had already taken place in the year preceding the move for many (73%) of the women and were largely due to changes in their health. With at least one on-site meal provided in all of the facilities taking part in the study, dietary changes are to be expected. One participant whose diet had changed due to diabetes commented, "*My daughter helps me shop but she won't buy me junk food.*"

Table 5.4

Anticipated Lifestyle Changes at the Time of the Move

Area of Change	Anticipated	N	Type of Change
Contact with others	87%	13	+
Diet	67%	10	-
Sleep	73%	11	-
Exercise	67%	10	+
Volunteer work	53%	8	+
Holiday celebrations	53%	8	+
Playing games	53%	8	+
Shopping	53%	8	+
Church attendance	40%	6	-
Physician visits	40%	6	+
Driving	40%	6	-
Family gatherings	40%	6	+
Social conflicts	33%	5	-
Recreation	27%	4	+

Cortisol Patterns. Salivary cortisol was collected at six time-points over a 24-hour period near the time of the first and last interviews in order to assess diurnal rhythm and changes in this rhythm. Samples collected in months two through five were taken at two time points corresponding to the peak (within the first hour after waking) and the nadir (near bedtime). The diurnal cortisol profiles at the time of the move can be classified into four distinct patterns: normal, normal-elevated, aberrant, and flattened. In general, these profiles are indicative of allostasis and allostatic load. Normal rhythms show a peak within the first hour after waking and a tapering throughout the afternoon. Elevated rhythms typically indicate a stress reaction, with the body producing excess cortisol and trying to regain homeostasis. Flattened patterns indicate the state of allostatic load in that the diurnal rhythm is absent because the homeostatic mechanism has been exhausted and the feedback mechanism is not working. Aberrant rhythms have been found in many cortisol studies but the reasons are unknown (Carolson, Speca, Patel & Goodey, 2004; Sephton, Sapolsky, Kraemer, & Spiegel, 2000; Touitou, Bogdan, Levi, Benavides, & Auzéby, 1996). A normal peak cortisol value (average) for adult women aged sixty and older is 9.1 and the average nadir is 1.7 (Aardal & Holm, 1995). The following figures (5.1 - 5.4) depict the four distinct cortisol profiles at the time of the move.

Figure 5.1: Normal Cortisol at Move

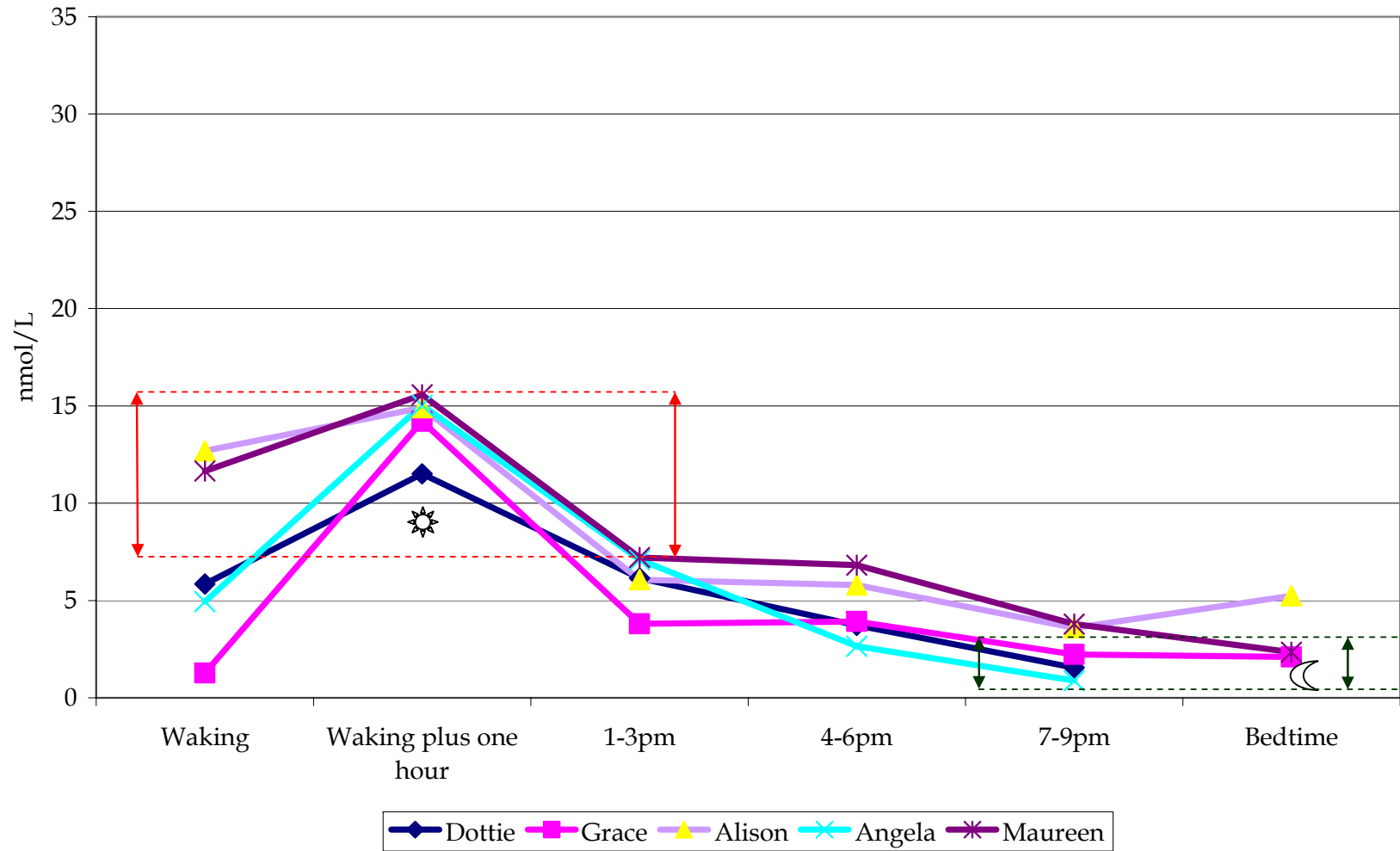


Figure 5.2: Elevated Cortisol at Move

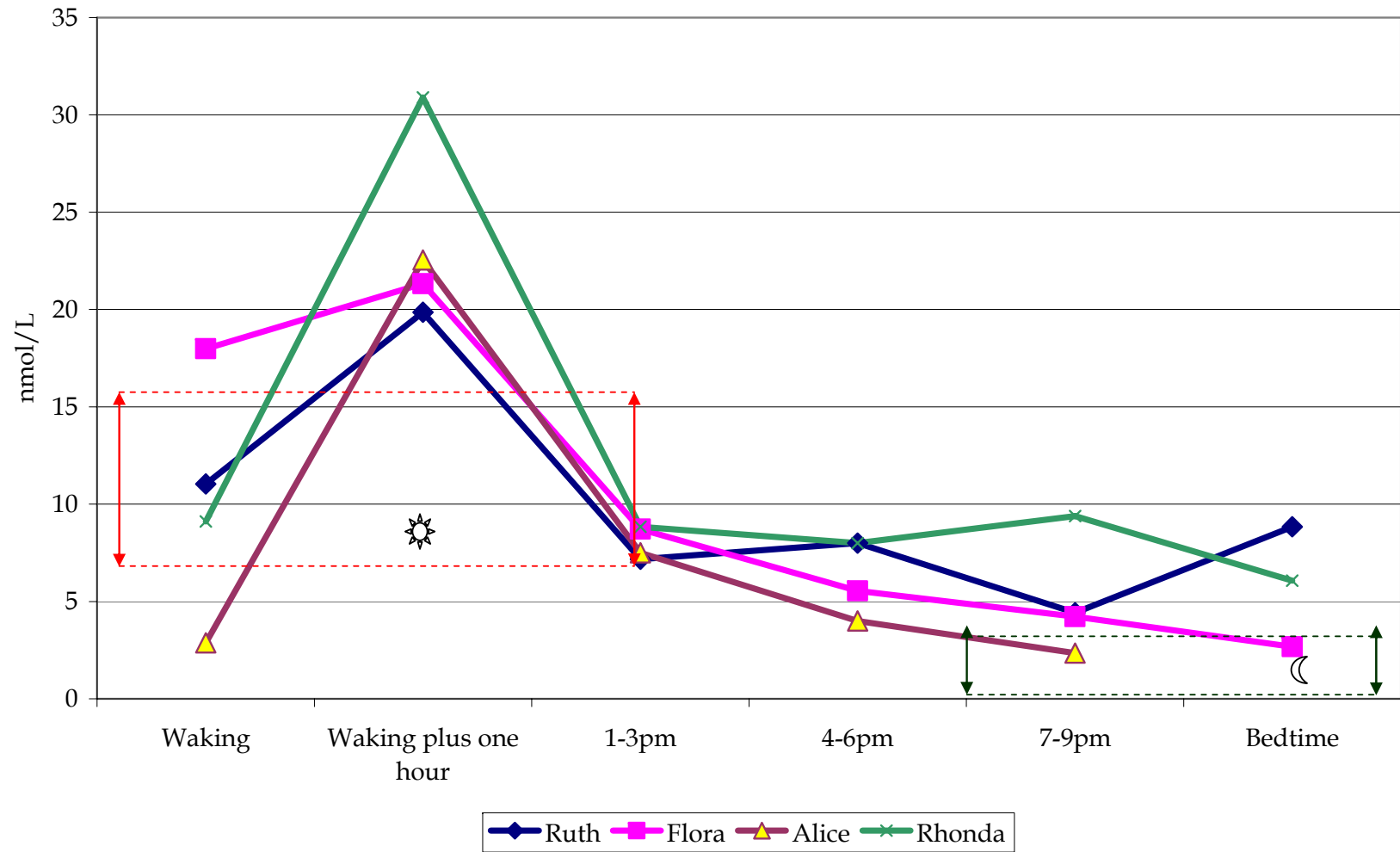


Figure 5.3: Aberrant Cortisol at Move

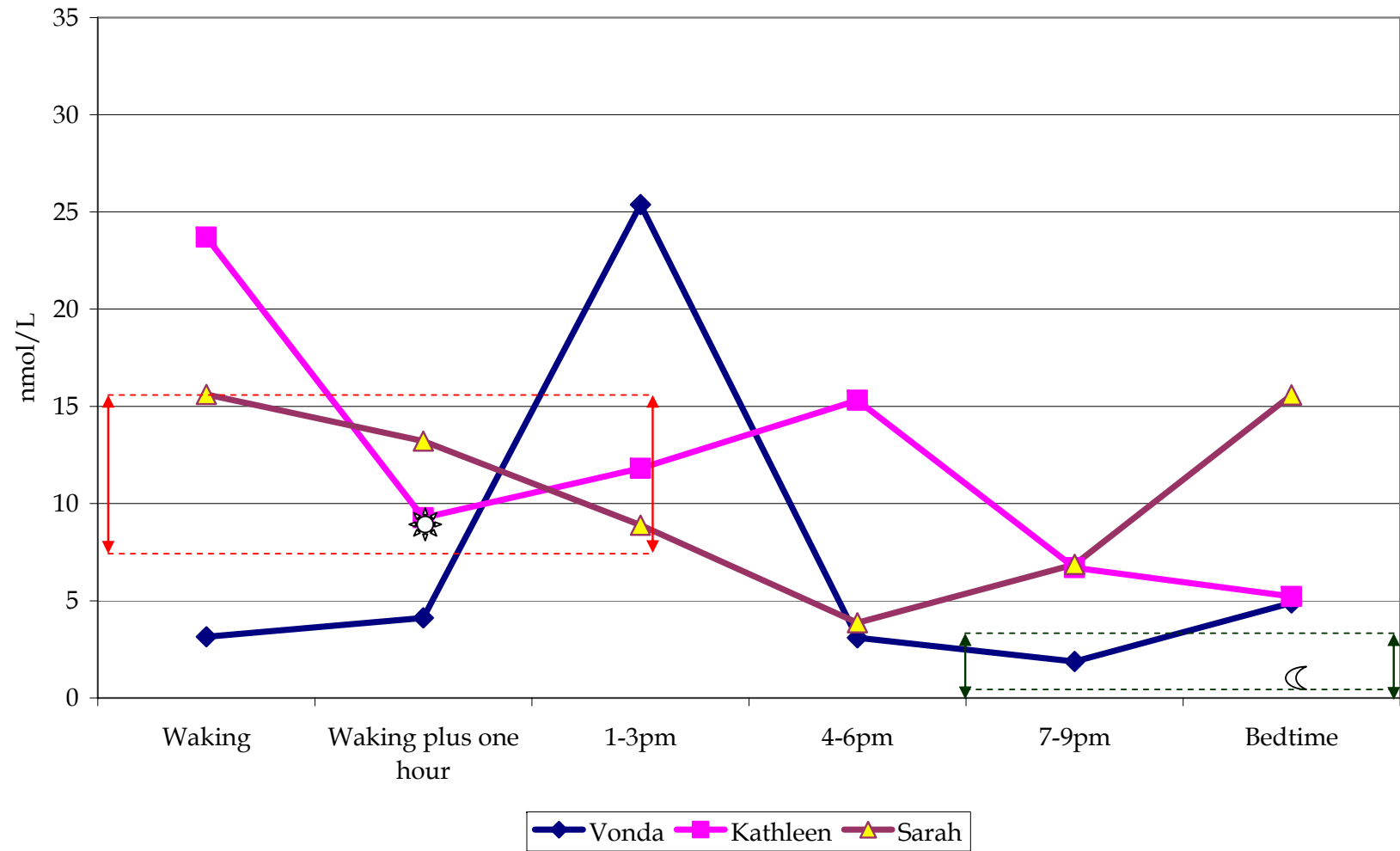
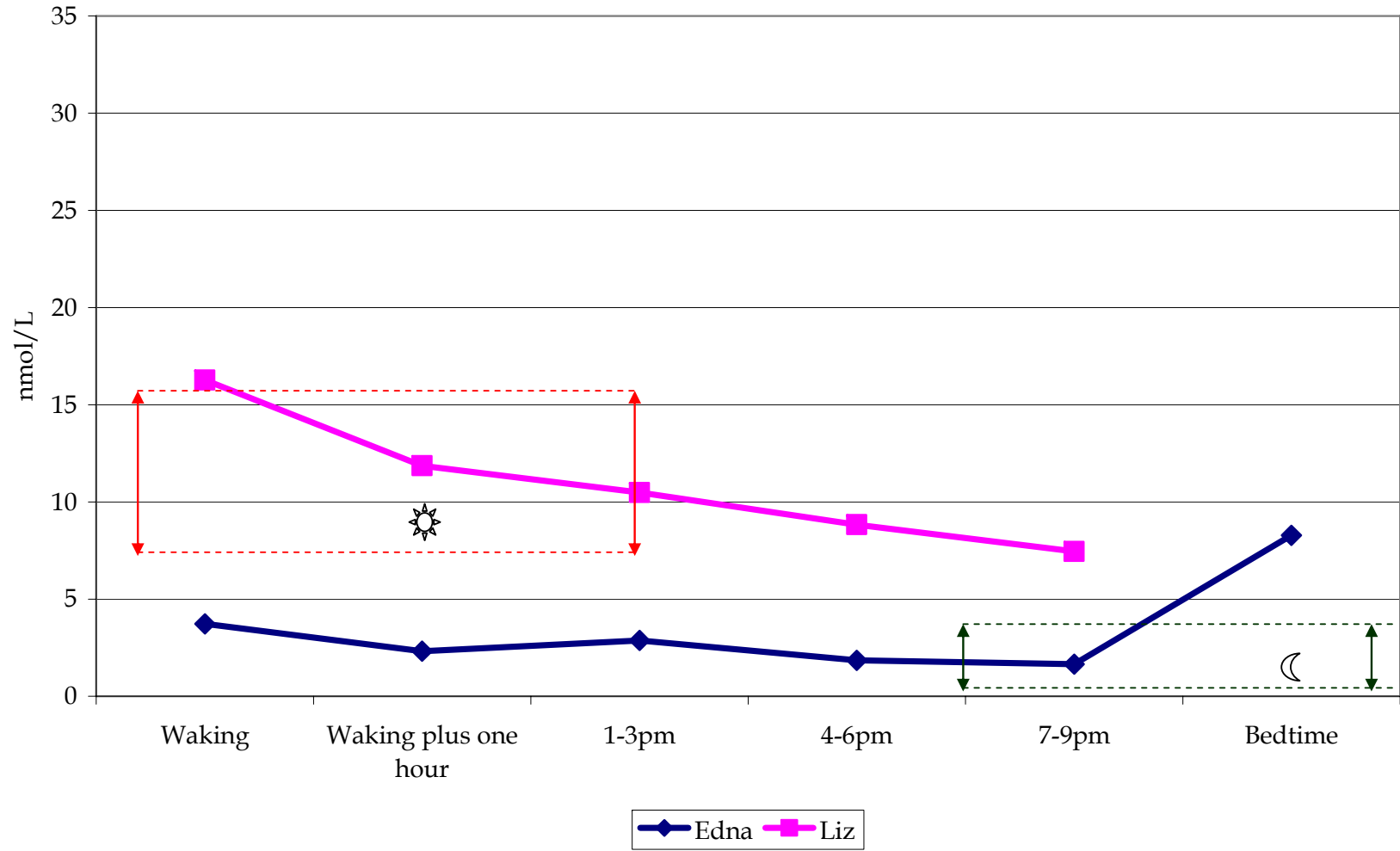


Figure 5.4: Flattened Rhythm at Move



LONGITUDINAL ANALYSES

Anticipated and Experienced Lifestyle Changes. In the first interview, participants were asked what areas of their lives they expected to change as a result of the move. In months three and six, they were asked what changes in lifestyle had occurred. Remarkably, there is congruence in many of the lifestyle domains. Contact with others, church attendance, and recreation activities were consistent and changed in the directions predicted at the time of the move. Volunteer work, anticipated to increase at the time of the move, did not increase except for one respondent. She began volunteering within the facility near her sixth month in residence. Similar to the story about Mary in the Prologue, this wonderful lady organized the Christmas decorating and festivities for the floor on which she lived in the facility. By the beginning of the New Year, she had also started volunteering at the front desk.

Dietary intake, sleep, church attendance, driving, and social conflicts were anticipated to decline post-move. Actual changes were not congruent with expectations in these domains. Dietary intake decreased for all but one participant. A participant who had been reticent to move stated “*I eat because I have to. I have no appetite.*” She was dissatisfied with many aspects of living in a facility with older adults and added, “*There is a parade of wheelchairs and walking devices in the dining room.*” Sleep actually increased for nearly half (46%) of the women. Half of the women attended church more often post-move and this is likely attributable to living in facilities affiliated with churches where chapel services are often held within the facility. Social conflicts also increased and were reported to occur with either other facility residents or children.

In discussing these lifestyle changes, one participant commented,

“Reorganizing my life to fit in has been the most difficult part of living here. The fact that my health causes problems interferes with a lot of activities. It’s not necessarily bad, but I expected to be able to do more but I’m doing less. I’m afraid I’ll stop completely sometimes.”

Table 5.5

Anticipated and Experienced Lifestyle Changes

	Anticipated T1 (N=15)	Experienced T2 (N=12)	Experienced T3 (N=12)
Contact with others	87% (13)	82% (10)	82% (10)
Diet	67% (10)	60% (7)	64% (8)
Sleep	73% (11)	60% (7)	64% (8)
Exercise	67% (10)	30% (4)	55% (7)
Volunteer work	53% (8)	0% (0)	9% (1)
Holiday celebrations	53% (8)	20% (2)	46% (5)
Playing games	53% (8)	30% (4)	40% (4)
Shopping	53% (8)	20% (2)	55% (7)
Church attendance	40% (6)	40% (5)	40% (5)
Physician visits	40% (6)	50% (6)	55% (7)
Driving	40% (6)	40% (5)	27% (3)
Family gatherings	40% (6)	25% (3)	40% (5)
Social conflicts	33% (5)	13% (2)	18% (2)
Recreation	27% (4)	25% (3)	25% (3)

Table 5.6
Significant Life Events Post-Move*

Life Event	Percentage Reporting	N
Change in residence	100%	12
Personal illness or injury	85%	10
Change in health of family member	60%	7
Death of friends	60%	7
Change in living conditions	60%	7
Change in social activities & recreation	36%	4
Change in church activities	36%	4
Change in number of arguments with family	36%	4
Gaining a new family member	30%	3
Change in financial status	18%	2
Death of family member	9%	1

* Mean number of life events post-move is 6 (± 3)

Life Events. Participants experienced an average of 6 (± 3) life events following their move. All reported changing residence as a significant life event, while only seven (55%) reported significant changes in their living environments. Ten women (85%) reported experiencing an injury or illness in the six months post-move. Over half, nine of the participants (60%), had seen changes in the health or behavior of a family member as well as the death of one or more friends. These most common life events require a substantial amount of adjustment in behavior and/or appraisal and are also mentioned as the top stressors in the months following the move. Table 5.6 presents the most common life events occurring after the participants had relocated.

Stress Perceptions and Coping Strategies. In the third and sixth months post move, participants were asked which aspects of their lives had provided the most satisfaction and which had been most stressful. In the third month, satisfaction came from successfully completing the move (n= 4, 36%), family (n=2, 18%), other residents (n=1, 9%), memories (n=1, 9%), and hobbies (n=1, 9%). One participant said that nothing gave her satisfaction. The greatest stresses in the third month included health issues (n= 7, 55%), family (n=2, 18%), sale of a house (n=2, 18%) and moving (n=1, 9%).

In the sixth month post-move, participants tended to give more than one answer to the questions on what provides satisfaction and stress. The sources of satisfaction were quite similar to the life events: family (n=5, 45%), friends and neighbors (n=3, 27%), move (n=1, 9%), hobbies (n=1, 9%), and independence (n=1, 9%). One participant commented, *"I am able to live here. The waitlist is long and I was on it for a year before I could move in. Having my independence at the age of 90 is wonderful. I'm lucky to be able to care for myself!"* Another commented on the benefit of living near peers, *"The nice thing about being here is that we've all lost someone but we have each other."*

In terms of stresses at six-months post-move, the move was still considered to be the most stressful (n=4, 36%), followed closely by deaths of

neighbors, friends, and family (n=3, 27%), family issues (n=3, 27%), and health and functional abilities (n=3, 27%). Participant comments post-move illustrate the many difficulties associated with moving, death, family, and health:

Moving Stress.

- *“The most difficult aspect of the last several months has been trying to sell the house and taking out the bridge loan. I’ve reduced the price to practically nothing. I’ll lose money if it sells, but it’s still better to sell it.”*
- *“I’m still looking for things since the move. That is my new year’s resolution – to get organized.”*
- *“I think part of it [difficulties] is getting to know things – people, histories, the area. We are like the country mice and city mice. I’m the city mouse in the midst of country mice here.”*
- *“Living here is too expensive and digging too deeply into my savings. My prescription costs have tripled since I moved. My rent is \$2250 a month here.”*

Death and Dying.

- *“I’ve lost my cat of 19 years this week. I’ve also lost many peers from school days in the last month. I lost another friend at the nursing home last week and three residents here in the last month.”*
- *“The coroner is here more than our children. It is disconcerting.”*
- *“Right now there are too many worries about health, mortality, and family. What’s going to happen is going to happen. I know my fate.”*

Family Issues.

- *“Not seeing my kids has been the most difficult part of living here. They don’t come or call as often. I felt like I’d been abandoned at first. I still feel that way at times.”*
- *On spouse with dementia: “I lost him a long while ago. He doesn’t always recognize me, but I go daily. I was told by the doctors not to spend all my holidays at the nursing home. He has been near death three times. I can’t not go.”*
- *“Family issues, by far. My daughters do not get along. They don’t care for each other. It grieves me.”*

Health and Ability.

- *“I have had pneumonia, congestive heart failure, and a urinary tract infection recently. I still have the CHF, but I feel a little better.”*
- *“They’ve increased my pain meds for the spine problem but it is making my breathing more difficult. The pulmonary hypertension is worsening. I’m having more sinus trouble lately and I can’t exercise. I’ve had two rounds of antibiotics and it’s still not cleared up.”*
- *“At the airport the kids talked me into riding in a wheelchair. At first I was indignant but it was actually a real luxury. I feared running into someone I knew and having them ask ‘Why are you in a wheelchair?’ This time last year I was playing tennis.”*

Participants were asked to report on the coping strategies they had been using since their move. Responses were very similar to those reported at the time of the move; however, in the months post-move fewer strategies were reported. Table 5.7 compares coping strategies mentioned at the time of the move and post-move. Additional strategies mentioned included walking and exercise, getting out of the apartment, practicing positive thinking, and medication. Distractive activities such as watching television, reading, hobbies, and keeping busy were quite common and considered to be somewhat effective. Talking with friends and family were also frequently reported and could be considered either problem or emotion-focused strategies depending on the context of the conversations. Avoidance strategies, such as withdrawal from others and avoiding the problem, were not reported in the months following the move. This is not surprising given that the move and health conditions were the greatest stressors and could not be avoided. However, two women said they would leave their apartments as a way to relieve stress. Contact with others, a pull factor to the new residence, may have impacted many of the solitary coping strategies. Emotion-focused strategies, crying and eating or snacking, were also not mentioned frequently following the move, while healthy behaviors (walking and exercising) were new strategies.

Table 5.7

Typical Coping Strategies at Move and After the Move

Coping Strategy	Percentage Reporting At Move	Percentage Reporting After Move
Prayer/Meditation	73%	55%
Keep Busy	73%	27%
Find Humor/Laugh	73%	27%
Reading	67%	64%
Watch TV	60%	46%
Talk to Family	53%	36%
Talk to Friends	53%	36%
Cry	33%	9%
Listen to Music	33%	9%
Church	33%	9%
Hobbies	33%	30%
Sleep	29%	18%
Talk to Professional	27%	9%
Eat/Snack	21%	0%
Avoid Stress	20%	0%
Withdraw/Be Alone	20%	0%
Walking/Exercise	0%	27%

Cortisol Profiles. Salivary cortisol was taken monthly beginning after the first interview. In months one and six, saliva was collected at six time points throughout the day in order to assess the shape and slope of the diurnal cortisol rhythm. In months two through five, saliva was collected at two time points during the day, within one hour after waking and bedtime, in order to assess the cortisol peak and nadir. These measures were taken one day per month in months two through five. For many of the women, cortisol levels remained consistent from month to month, regardless of the stresses they had experienced. Others showed distinct elevations, particularly at the peak, during stressful life events. Figures 5.5 through 5.14 depict cortisol changes over time. Significant life events and the months in which these occurred, are noted on the figure. Two symbols are noted on each graph: a sun indicates the normal average peak value (9.1) for women over the age of 60 years and a moon represents the normal average nadir value (1.7) for women over the age of 60 years.

Figure 5.5 represents life events for Liz a participant who relocated to a senior housing facility where her mother with dementia had been residing. Her cortisol level was elevated at the time of the move, but returned to normal levels soon thereafter. In her sixth month in residence, her mother's health declined which necessitated placing her mother in a nursing home, dispersing her mother's belongings, and cleaning out her apartment. As the graph shows, her cortisol levels spiked in month six.

Figure 5.6 depicts the changes over time for Rhonda, a participant whose health was declining prior to the move. She had been hospitalized, near death, on multiple occasions. When she moved to the facility, she put her house on the market, but it did not sell for four months. During this time, money was a concern as were medical expenses for her health care, and the sale of her house was a great worry. After her house sold in the fourth month, her cortisol peak levels subsequently returned to normal.

Cortisol levels for Grace, one of the caregiving participants, are depicted in Figure 5.7. Grace had been a long-time resident of Lexington but moved to the country in 2000. She returned to Lexington to care for her daughter who is dying of Huntington's Disease. Within one month of moving, she turned the power of attorney responsibility for her dying daughter over to another daughter. Her responsibility was then limited to instrumental and emotional support. Grace did not integrate socially within the facility, but expressed no desire to do so. Her cortisol levels remain in the normal range, however, it appears as though her morning samples may not have been taken at a time to adequately capture the peak levels.

Dottie, an exuberant and humorous woman, relocated to be nearer family due to health concerns. Her cortisol levels remained remarkably consistent through the first several months in her new residence as can be seen in Figure 5.8. In her third month, she experienced a significant health condition which required a three-week long stay in the hospital, which she considered stressful but her cortisol peak did not elevate. *"When I was in the hospital, I stole a wheelchair so I could go outside to smoke. I had to call my daughter to come to help me. I couldn't find my room. She was mad!"* In her sixth month, she discovered her best friend dead in her apartment. This resulted in a significant elevation in cortisol.

Figure 5.9 presents the profile for Alison, a woman whose husband is suffering dementia in a nearby nursing home. She was asked to move from a two-bedroom to a one-bedroom apartment not long after relocating to the facility. She had surgery in her third month which was followed by a prolonged hospital stay for her husband. He was subsequently discharged on hospice care. In month five, Alison came down with a terrible case of shingles and was bed-ridden for several weeks. Her beloved cat, as well as several neighbors and friends, died in her sixth month. Her cortisol levels were consistently elevated.

Kathleen, a Lexington native, relocated to senior housing after a long wait on the facility waitlist. Her cortisol profile can be found in figure 5.10. In the

first several weeks following the move, Kathleen was having trouble sleeping. She has a history of chronic back pain and in month three, she was undergoing tests to ascertain whether a spot on her lung was cancerous. It turned out to be benign and in the months following the initial tests, her cortisol levels had returned to normal.

Figure 5.11 depicts the profile for Edna, a very ill woman whose health continued to decline in the months after her move. She has a history of serious lung disease as well as back pain. Her initial diurnal cortisol profile was a flattened rhythm, indicative of allostatic load. She left the facility not long after her six month interview to be closer to her daughters for increased care.

Sarah, a woman who had been fighting brain and breast cancer for several years, relocated to senior housing with her husband. Her profile can be found in figure 5.12. Her diurnal rhythm was aberrant at the time of the move and may be due to frequent naps throughout the day and night. In month three, she was being evaluated for the reoccurrence of a brain tumor, which turned out not to be the case. In month four, near Christmas, Sarah broke a bone in her foot.

Figure 5.13 depicts the cortisol profile for Ruth, a woman who had moved to Lexington from out of state. She was not happy with the move, her new apartment, or facility living. Her cortisol levels remained constant and within normal levels throughout.

Flora, an athletic woman in good health, can be found in Figure 5.14. Flora's husband had put their names on a waitlist to move into a continuum of care community, but he had passed away before the move. Flora put the house up for sale when she learned that an apartment was available. Throughout the six-month period of the study, her home did not sell and this caused her considerable distress. She was very active within the facility, had many friends, and increased her church attendance. In month five, she began getting corticosteroid injections in her spine to relieve back pain and inflammation. The elevations seen in month five are likely attributable to these injections.

Summary. The findings presented in this chapter provide a foundation upon which future research can build. Distinct patterns of cortisol reactivity – normal, normal-elevated, aberrant, and flattened – are seen at the time of the move. This suggests that some women (normal profiles) were not physiologically reactive to the stress of the move while others were (elevated). Flattened rhythms indicate a state of allostatic load. Women had experienced nine life events in the year preceding the move. A mixture of emotion and problem-focused coping strategies were reported by the women, with prayer, staying busy, and talking rated as the most effective. A significant relationship between health and multiple coping strategies could reflect that those with a wider range of coping behaviors have better health. Proactive coping was related to increased positive affect.

Sources of stress in the months following the move include the move itself, issues surrounding death (either friends or other residents), family issues, and health problems. Distractive coping behaviors were more frequently reported following the move. Cortisol levels were variable for some women and appeared to be related to significant life events and not necessarily facility living. Levels were more consistent for other women, despite ongoing and emerging stresses. The next chapter discusses the significance of these findings and future directions.

Figure 5.5: Cortisol Peak and Nadir Profile for Liz

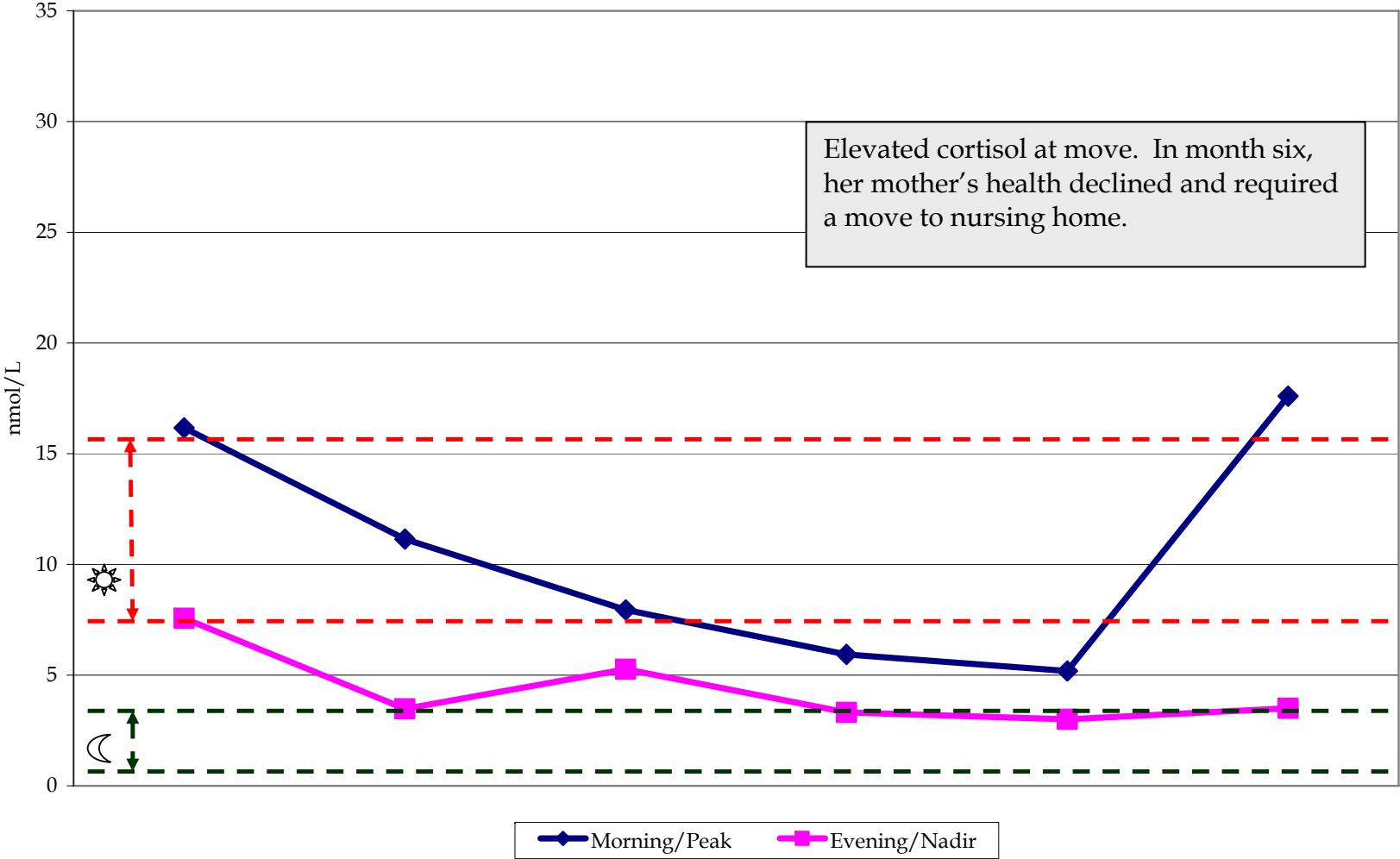


Figure 5.6: Cortisol Peak and Nadir Profile for Rhonda

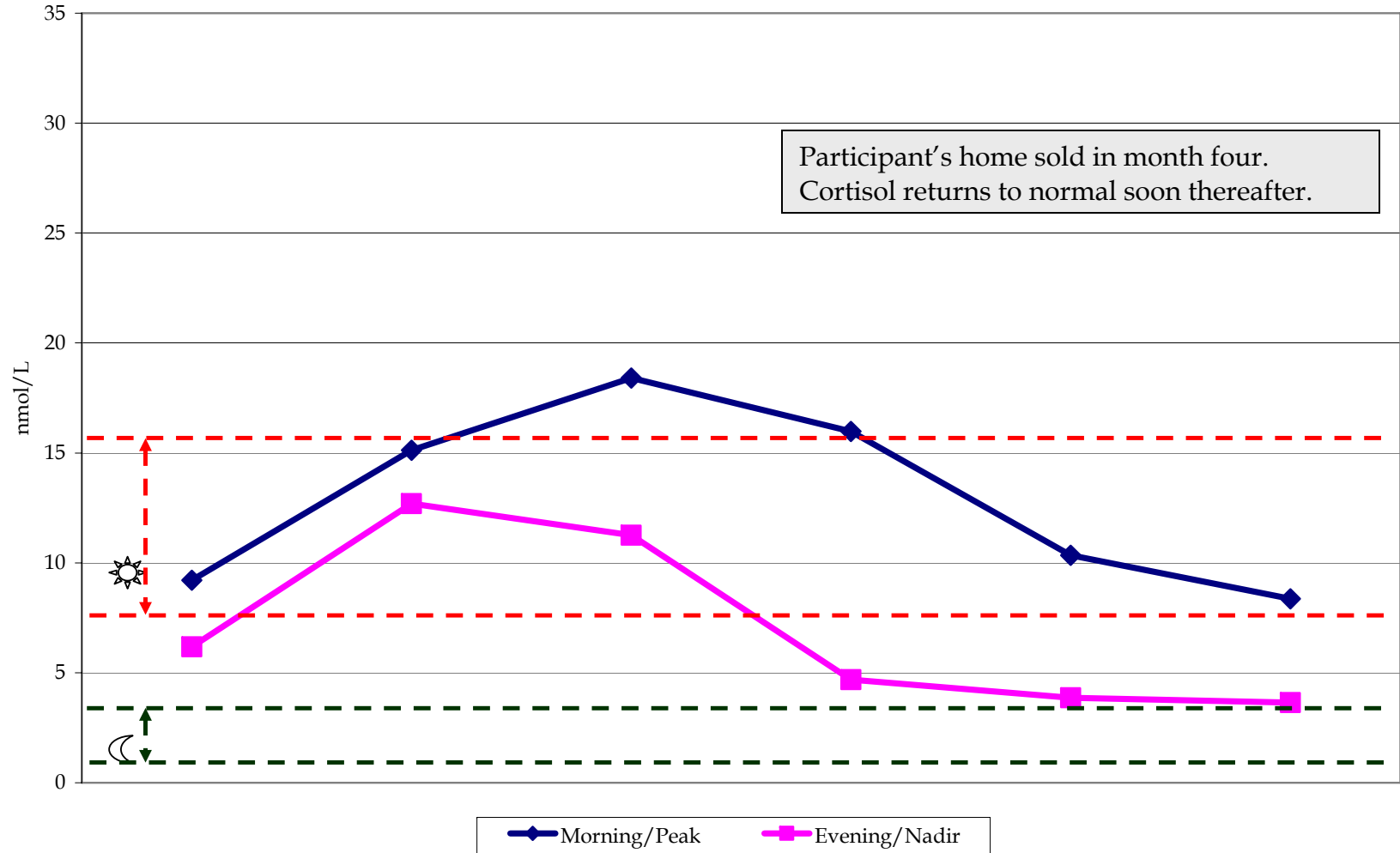


Figure 5.7: Cortisol Peak and Nadir Profile for Grace

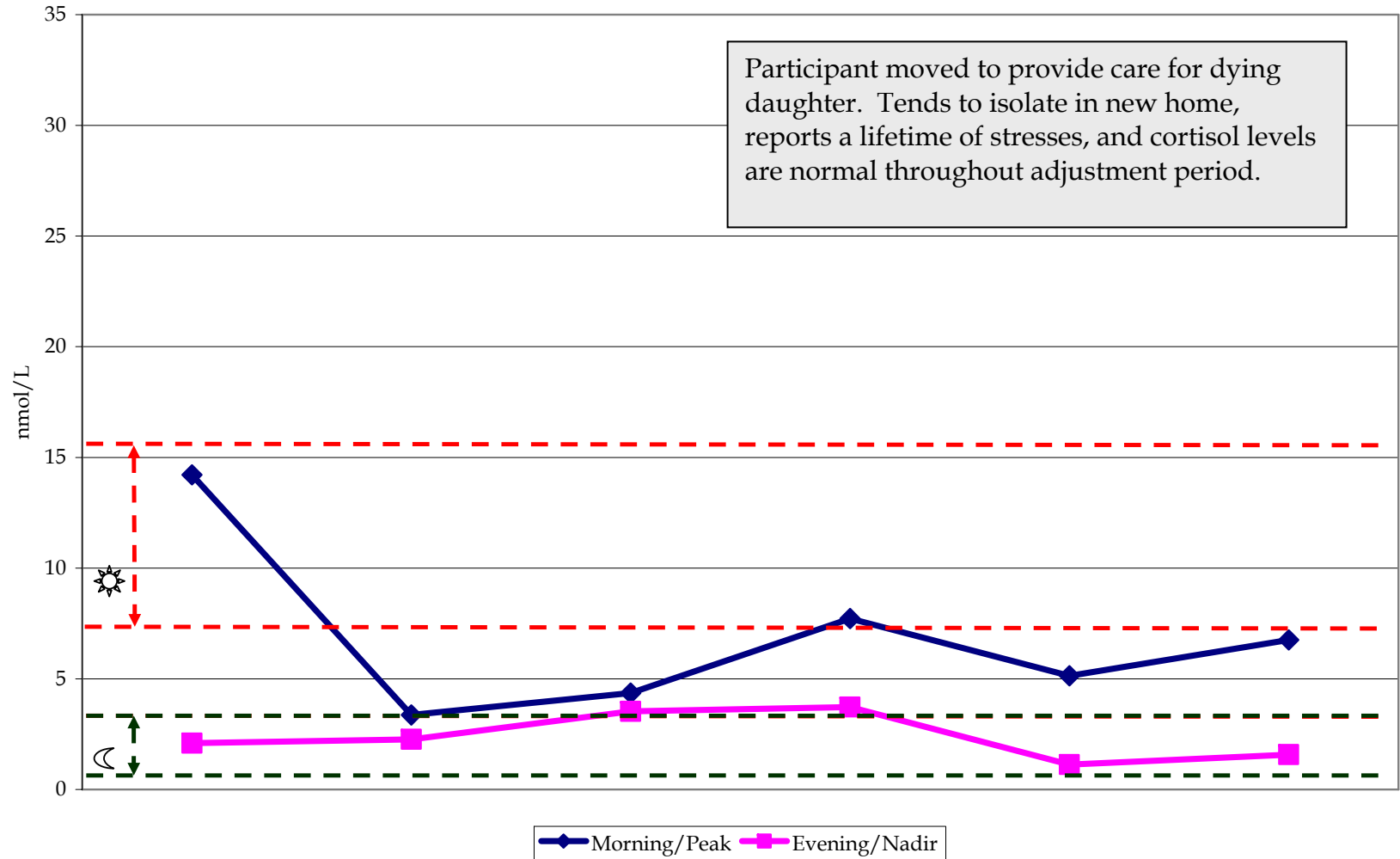


Figure 5.8: Cortisol Peak and Nadir for Dottie

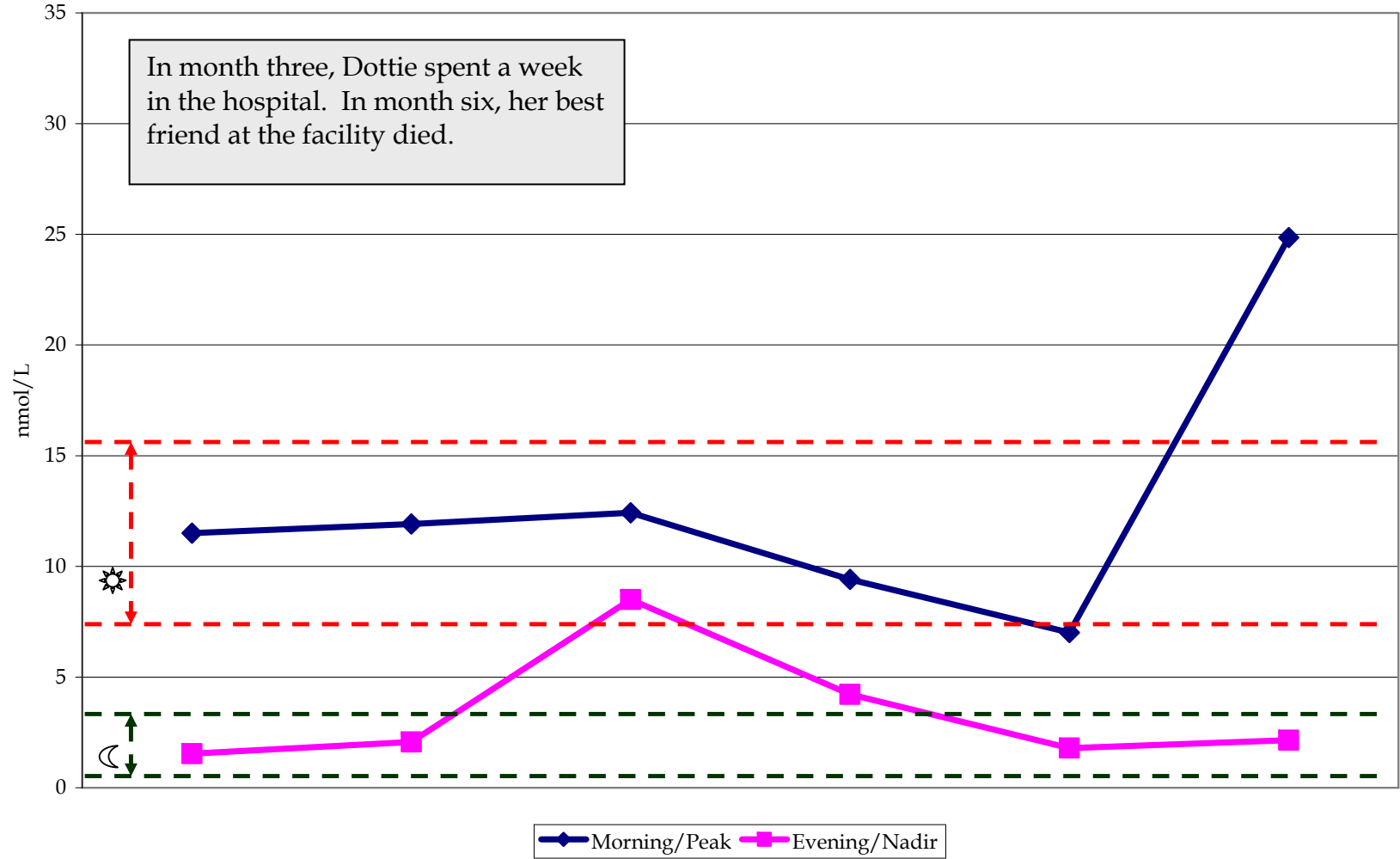


Figure 5.9: Cortisol Peak and Nadir Profile for Alison

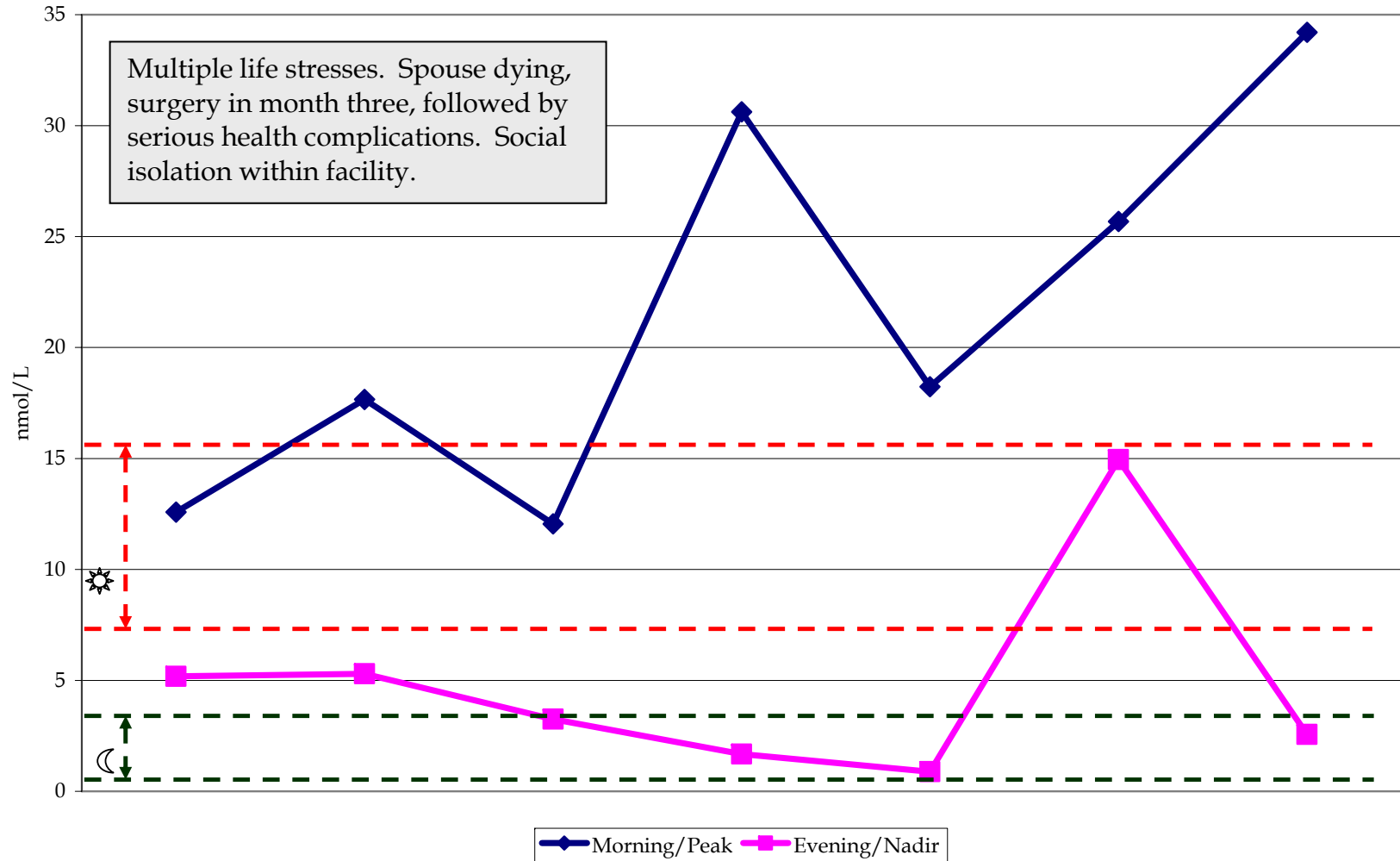


Figure 5.10: Cortisol Peak and Nadir Profile for Kathleen

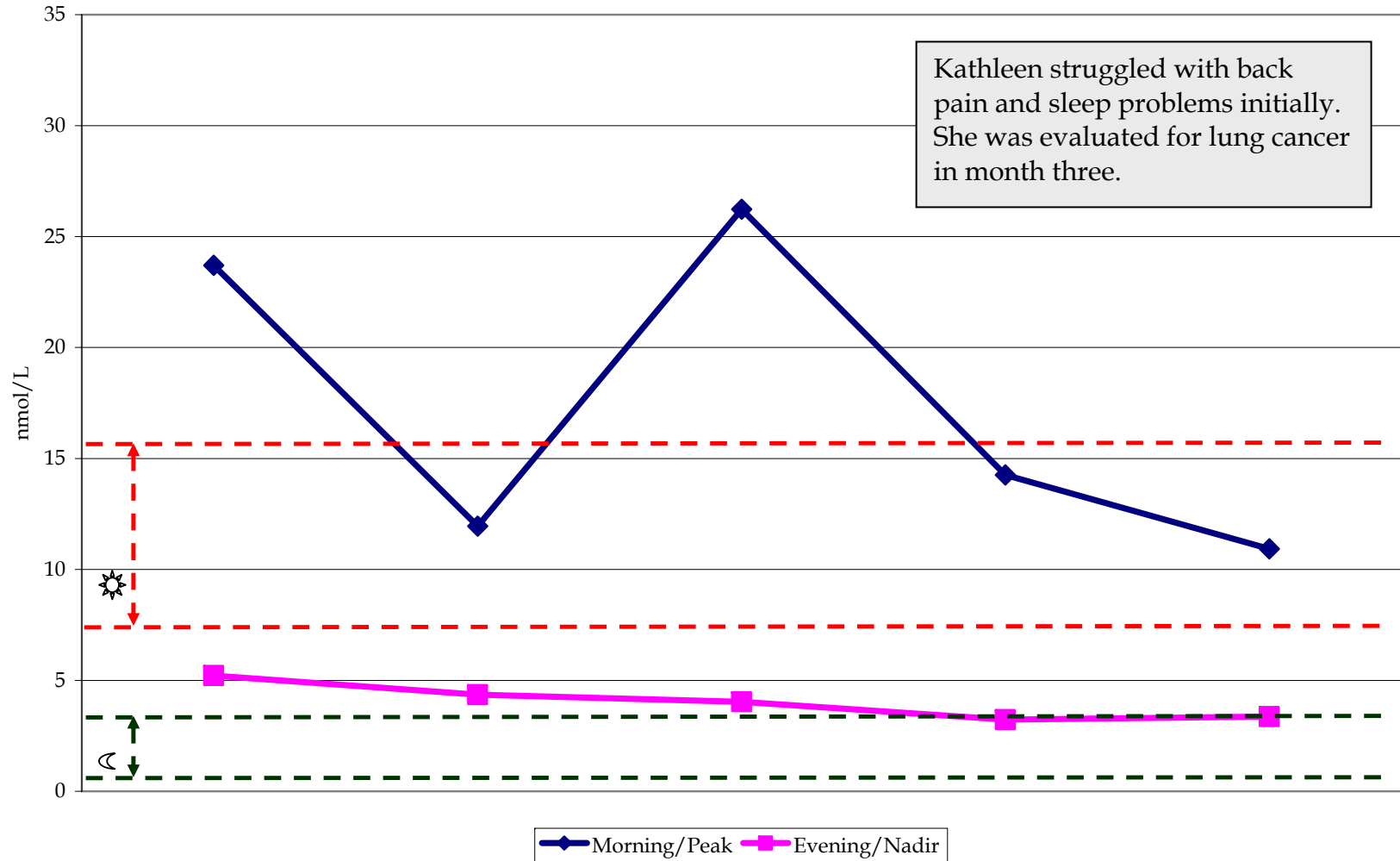


Figure 5.11: Cortisol Peak and Nadir for Edna

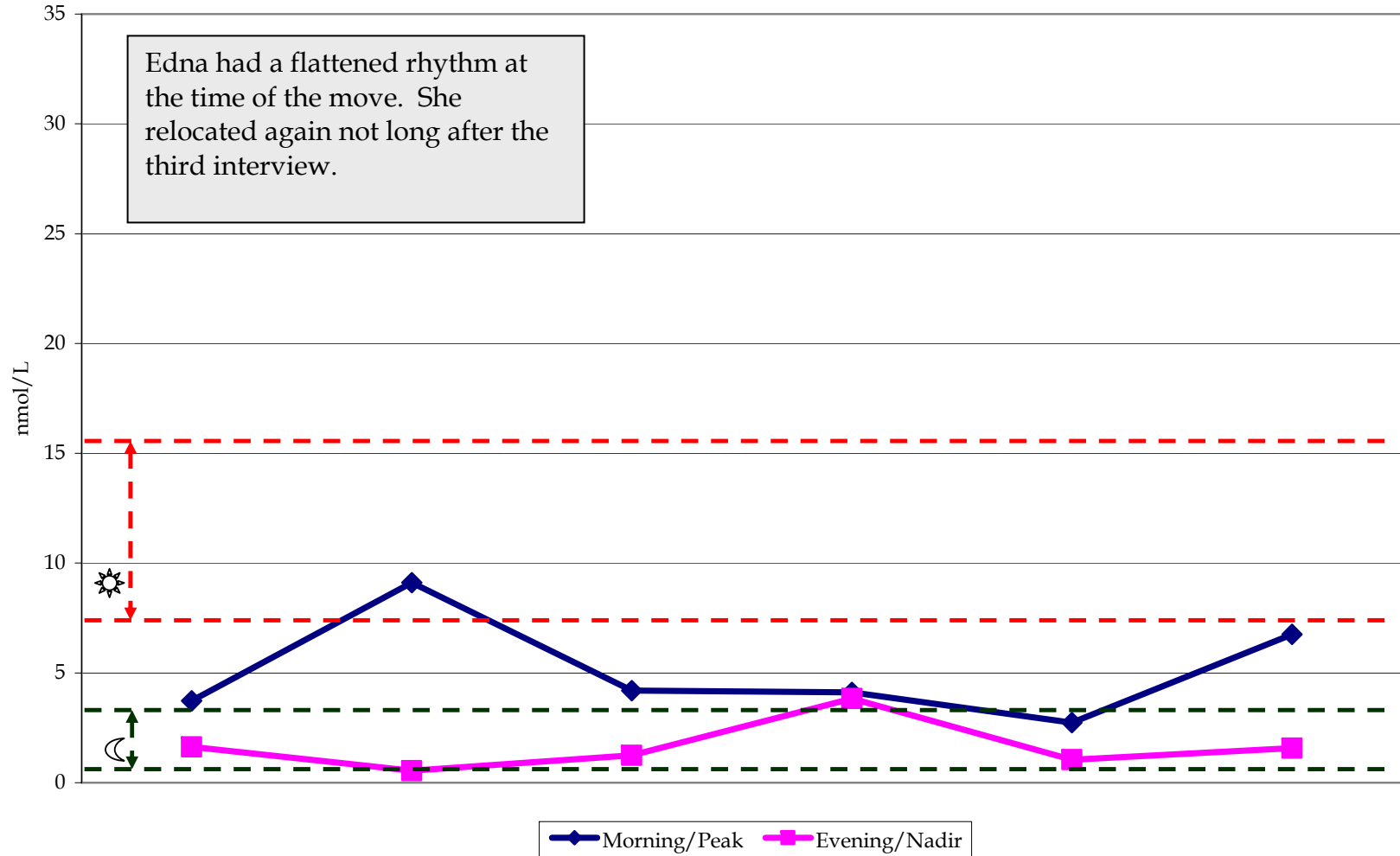


Figure 5.12: Cortisol Profile for Sarah

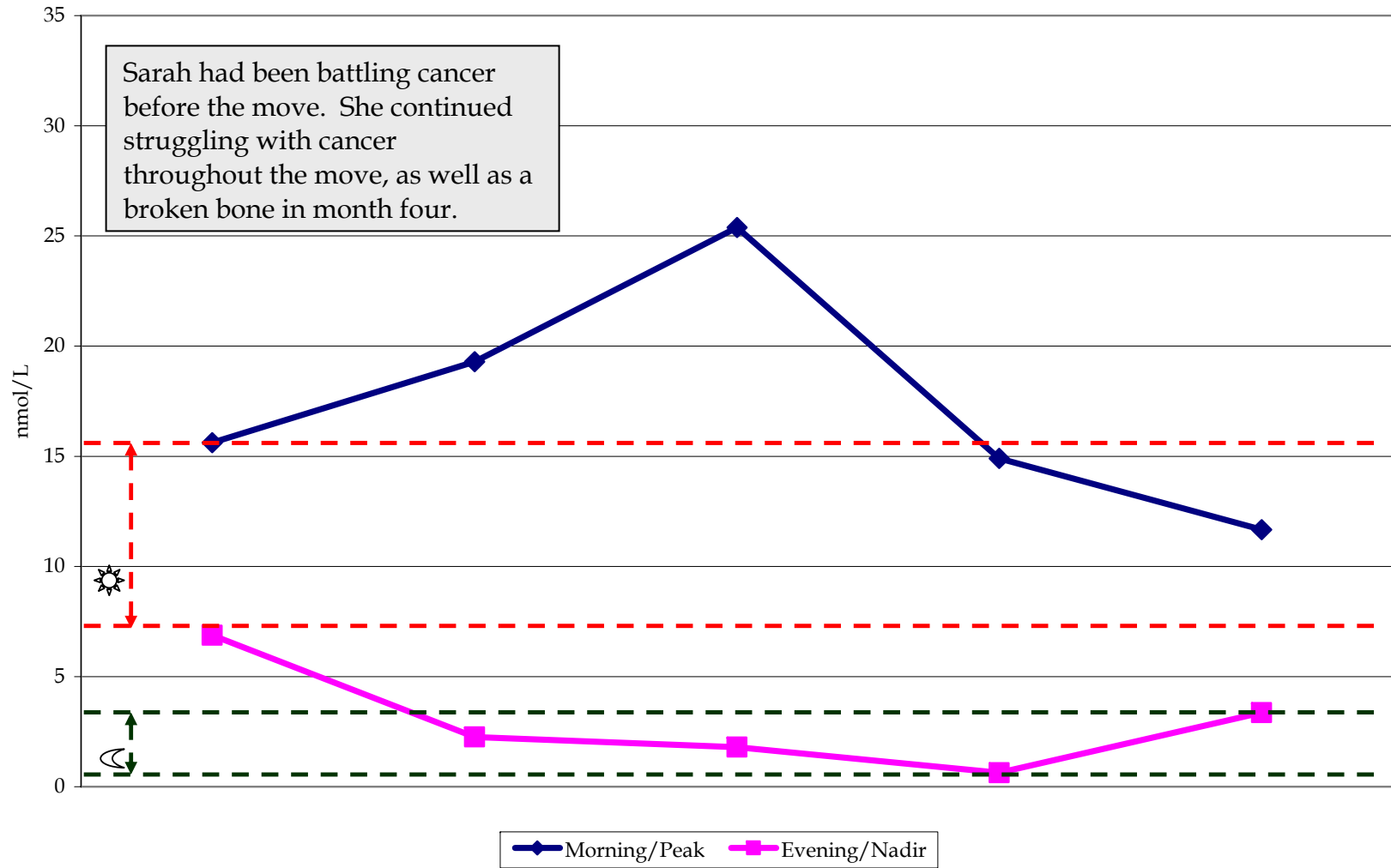


Figure 5.13: Cortisol Profile for Ruth

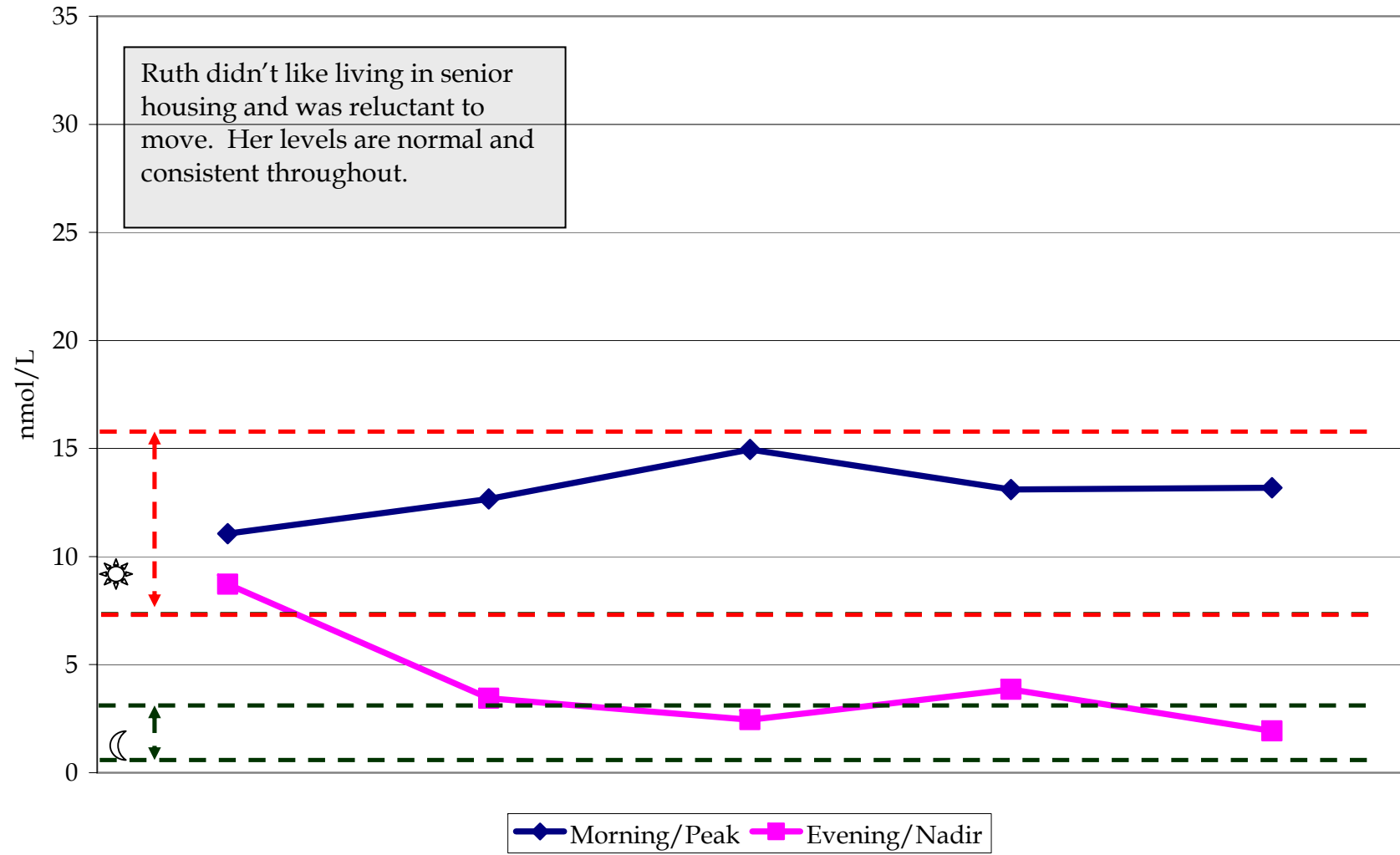
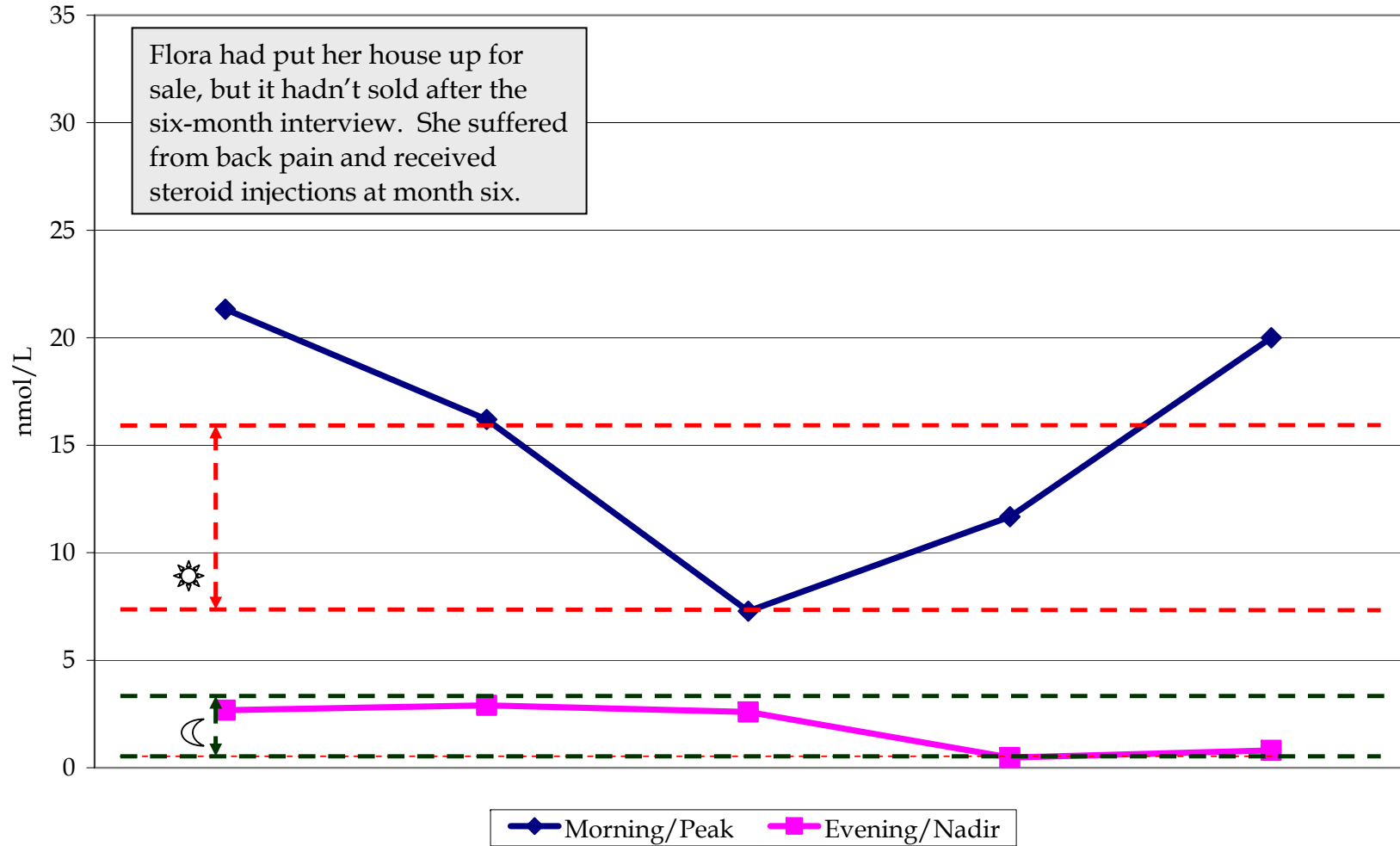


Figure 5.14: Cortisol Profile for Flora



CHAPTER SIX

CASE STUDIES

Given that the theoretical model of allostasis is based on the premise that the body is attempting to maintain or achieve stability through change, there are three probable outcomes: a balance among systems (homeostasis), a process of negative feedback which attempts to bring systems into adjustment (allostasis), and dysregulation of the systems (allostatic load). This chapter presents more in-depth case studies of three women who fit the profiles for each of these outcomes.

Homeostasis: The Story of Liz. Liz was a 75 year old woman who relocated to Lexington from a nearby community in order to be nearer her mother who was living in a senior apartment complex. Liz's mother had lived at the facility for several years and Liz was familiar with the facility staff and many of the residents. She had often come to Lexington to take her mother to physician appointments and on shopping excursions. Her children were grown and had moved to various locations throughout the United States. In the year preceding the move, her spouse had died. Her sister, also a recent widow, lived in Lexington as well and they had been talking more, which was helpful to Liz in her time of grief. Additionally, Liz found her large house in the country too burdensome and she was seeking more social contact and recreational opportunities. Moving to the facility in which her mother lived was the ideal solution; she believed it would be easier for her to provide assistance as her mother's dementia continued to progress. Additionally, Liz's income had been reduced following the death of her spouse and the apartment complex was HUD subsidized. A distinct benefit of the HUD subsidized housing was that her rent was less than the utility bills were in her long-time home.

In the year preceding the move, Liz had experienced fourteen significant life events, including the death of several family members (including two brothers-in-law and a cousin) as well as close friends; changes in diet due to recently diagnosed food allergies; changes in financial status, living conditions, personal habits, recreational and social activities; and changes in the health and behavior of her mother who had been diagnosed with dementia. Her daughter relocated out of state. She reported a great deal of satisfaction in selling her home, but she quickly added, *“This sense of grief [over spouse’s death] precludes much joy.”* The most stressful aspect of the year was her spouse’s death. He had been her first boyfriend, beginning in the first grade, and they had been constant companions throughout their lives.

Liz used a variety of coping mechanisms, both solitary and group inclusive behaviors, problem and emotion focused strategies. The most effective strategies for Liz were prayer, reading, talking with friends, volunteer work, and gardening. The solitary activities were “relaxing” yet talking with friends was the ‘greatest blessing’ she knew. Volunteer work made her feel useful and valued. Watching television, hobbies (mainly quilting), church activities, and finding humor were somewhat effective. She often cried, but did not find it helpful in alleviating stress. She said that her approach to the multitude of stresses was to find what she needed to be able to move ahead, which is a key concept in problem-focused coping.

At the time of the move, Liz was sleeping soundly through the night, averaging nine hours of sleep per night. She reported enjoying sleeping in until 9am on a typical day. She valued this ability to sleep, acknowledging that it was rare in women her age. She was taking a variety of medications for various health conditions: depression, high cholesterol, hypertension, acid reflux, restless leg syndrome, allergies, and anemia. She had taken a steroid, predisone, for breathing difficulties until her allergies were diagnosed. Liz had ceased taking the predisone within the year prior to the move and had found relief

through dietary modifications. Liz did not drink alcoholic beverages and had quit smoking cigarettes forty years earlier.

Liz had few limitations in her ability to engage in daily living activities. She reported some difficulties with vigorous activities and walking more than a mile. The limitations had begun at the age of 73, just two years before her move to the facility. Her health conditions included food allergies, osteoarthritis, hypertension, osteoporosis, and gastric reflux. Aside from the allergies, she had been diagnosed with these conditions six to seven years before the move. Liz rated her health as a 9 on a 10-point Cantrell ladder, meaning that she considered herself to be in excellent health.

At the time of the second interview, Liz was settling into her new apartment, 'instigating' a lot of activities in the facility and making new friends. She had begun to provide transportation for other residents of the facility in addition to food provisions for residents who were ill. She expressed some frustration with the lack of participation in facility activities, but said she was becoming more satisfied as she became acquainted with other residents and could get the ladies on her floor engaged. Her sleep patterns had changed for the worse because she found it difficult to sleep late in the mornings. Liz was on the go constantly, explaining that "I keep myself busy. I can't sit without doing something. That's just not me."

The social activities and helping others in need provided her with satisfaction and made her feel as though her problems were 'not so bad'. Her mother's health was stable and she was spending time with her daily. Two issues provided regular stress: sharing a laundry room with the rest of the floor and disagreements on family issues with her oldest daughter. Liz mentioned only a few coping strategies at the second interview, among them prayer, keeping active, socializing with others, watching television, and reading. Her solitary activities were ways of winding down and finding reasons to be thankful at the end of each day.

She had only changed one medication since the move, switching from over-the-counter Tylenol to a prescription painkiller, Lortab. She had fallen in her third month and broke three ribs on her left side. She didn't remember falling, only 'waking up' and finding herself on the kitchen floor. The painkillers, she emphasized, were only temporary and she only took them when needed. She said that her energy had declined since the move and attributed that to 'living in a small space' and finding it harder to be active. Despite Liz's frustration, she was keeping herself very active and making friends within the facility.

In the fourth month living in her new residence, several things occurred – both good and bad. She took a long weekend to visit her daughter who had moved out of state and was able to leave her mother alone with no problems. Another daughter, with whom she had been increasingly frustrated, re-married. Liz' new son-in-law was a convicted felon living in a state penitentiary and she was so angry that she decided to disown her daughter.

Six months after Liz' move to the facility, she was content with her life and new home. The most positive aspect of living in the facility, aside from being close to her mother, was the social connectedness. *"At first I didn't consider this my home. I missed my house and flower garden. Now I'm happy. I feel like some of my grief has passed."* Most of her frustration was at the lack of control over the environment but she understood that living in government housing meant she wouldn't be allowed to paint her walls or make many modifications. She stated that the other residents were like family or dear friends.

She was experiencing more difficulty sleeping since the move due to trouble with restless legs. She had ceased taking medication for the condition and found it harder to rest through the night. Her mother had experienced more behavior problems, particularly wandering behaviors, between the fourth and six month of her residence in the facility. At the time of the third interview, Liz had just relocated her mother to the adjacent nursing home and found herself

completely occupied with emptying her mother's apartment and preparing for the Christmas holiday. Contact with her children was much less frequent and she was concerned that the holidays were going to be difficult given the strained relationship with her daughter and her mother's adjustment to the nursing home.

Despite the stresses, Liz continued to stay busy and prayerful. She had begun formal volunteer work within the facility and was most pleased with having contact with other residents. Liz felt as though her apartment was home and found comfort in knowing that her mother was receiving good care in the nursing facility less than 100 yards from the senior-living apartment facility. Her peak cortisol levels were elevated at the time of the move, but quickly fell into the normal range and continued to remain within the 95% confidence interval. Even though she faced many stresses, a serious fall, and changes in her daily activities, Liz was able to achieve and maintain homeostasis over the course of the first few months in her new residence. In her sixth month, just a week after her mother was relocated, her cortisol levels again rose indicating a stress reaction. This was not surprising considering the increased level of activity she had undertaken, the responsibility of attending to her mother's affairs, and caregiving responsibilities associated with her mother's declining mental function. However, Liz had handled multiple stressors successfully and was well-equipped physically, emotionally, and socially, to handle these additional changes.

Allostasis: The Story of Alison. Alison was a 79 year-old woman whose husband of 59 years had been stricken with vascular dementia. Their son had built them a large home in a rural area outside Lexington, but when Allison's husband was unable to live at home any longer, he was placed in a nursing home in Lexington. Feeling overwhelmed with a large house and lawn, a lengthy commute to the city, and no children nearby, Alison sold the house and relocated

to an apartment nearer her spouse in Lexington. It wasn't long before her own health was declining and she stopped to inquire about living arrangements at an assisted living facility that was even closer to her husband's nursing home. She made the decision to move to the assisted living facility on her own and stated, "*I prayed a lot to ease my mind.*" At the time of the move, she had no contact with her children. Indeed, it had been sixteen years since she'd last spoken with her daughter and two years since she'd heard from her son. With great sadness she spoke of how her two children had abandoned them when her husband, their father, became ill.

In the year preceding the move, she could not identify anything that provided her with satisfaction. Her own and her husband's health coupled with financial concerns were the most stressful aspects of life in the year before the move. Additionally, Alison had experienced nine significant life events, including a fall which resulted in a broken bone, death of close friends, changes in her husband's health and personality, major change in living conditions, declines in church activities and attendance, and declines in social activities. She coped with these stresses through prayer and counseling sessions with her minister. She found distractive and solitary activities, such as reading, watching television, taking a bath, and keeping busy with hobbies somewhat effective in alleviating stress. In the past, she reported that laughing or finding humor a typical strategy, but it was not effective any longer.

At the time of the move, her sleep patterns were "awful" and hadn't been good for several years. She reported waking an average of 12 times a night, with four hours of sleep typical for her. She tried to take daily naps and believed them to be approximately 1.5 hours in length. She was taking Ativan to help her sleep. She didn't eat properly when she was alone and immediately found the dining accommodations in the AL community of great benefit. She reported taking medication for anxiety, depression, heart trouble, thyroid dysfunction, and stomach/esophageal upset. The stomach problems had begun in the

preceding 12 months. She had never been a smoker and did not drink alcohol. Alison had reported limitations many daily activities, such as climbing stairs, walking uphill, bending or stooping, and walking distances greater than one block. She had been unable to do certain kinds of work because of health and functional declines for five years. Her exercise was limited to physical therapy exercises and traction at her physician's office.

At the time of the second interview, in her third month in the assisted living facility, Alison reported better dietary habits, declines in shopping because it had "become a chore", and increases in physician visits due to an ear ache and surgery to remove a severely arthritic toe. The ear ache was the result of teeth grinding at night while she slept. Her physician had doubled the dose of her anti-depressant (Effexor) and prescribed Xanax to help her relax enough to sleep at night. She stated, "*My mental health is better since they doubled the Effexor.*" She reported that the management and facility staff were surprisingly helpful in the week following her surgery, stopping to check in on her and delivering meals to her room. She believed the social environment was satisfactory, although she mostly kept to herself. Her husband's health had stabilized and this gave her the most satisfaction since relocating. On their 60th wedding anniversary, they were able to reminisce about their wedding and early life together.

Alison's third interview, scheduled for month six, had to be postponed several weeks due to her health. She had developed a severe case of shingles that affected both eyes, over half of her face, and she was in a great deal of pain. She was able to complete the saliva collection protocol, and the graph (Figure 5.9) shows seven months of cortisol measures. At the time of her third interview, in month eight, she had finally managed to sleep through a night and was very pleased at being able to do so. The shingles, as she stated, "laid her low" and her dietary habits had returned to 'awful' despite attention and meal delivery from the facility staff. She had further withdrawn from the social community, but reported the three friends she had in the facility were 'like family.'

Her husband's physical and mental health had declined significantly. He had spent time in the hospital with pneumonia, he often didn't recognize her, and was discharged back to the nursing home with hospice care. With a voice of distinct grief, she said, *"I lost him a long time ago, I realize this now."* A friend living in the nursing home as well as her feline companion of 19 years had passed away earlier that week. Three residents of the assisted living facility had died over the course of the month, as had a few of her childhood friends. *"You get so close to people and then they're gone. I've learned a lot from people [at facility] and a different way of living."* Her children were constantly on her mind and she wished they would return, but felt powerless to do anything to improve the situation.

Alison's salivary cortisol peak levels are within normal range in the first and third months (See Figure 5.9). In the fourth through seventh months, the peak cortisol levels more than double. It was during these months that her husband's health drastically declined, her friends died, and she had developed a sinus infection and shingles. Glucocorticoids, such as cortisol, have been found effective in dampening the immune system in order to prevent excess inflammation of bodily tissues (Ullrich et. al, 2005). As Alison's salivary cortisol profile clearly indicates, her cortisol levels were exceptionally high and coincide with the onset of her sinus infection and shingles. Alison's experiences reflect the body's attempt to manage stress and achieve allostasis. Presumably, if the stresses she was experiencing in her eighth month continued with no changes in coping strategy or interventions, Alison's cortisol profile would eventually lead to a state of allostatic load.

Allostatic Load: The Story of Edna. Edna was 80 years old when she relocated from her long-time home in southern, rural Kentucky to an assisted living facility in Lexington. Afflicted with degenerative polyneuropathy in her spine, Edna was unable to sit, stand, or walk for long periods of time. Prior to the move, her oldest grand-daughter lived with her and assisted with shopping,

banking, and errands. However, when this granddaughter needed to relocate for a job, Edna was forced to move since she was unable to live alone. Her daughter found the facility and the whole family assisted with sorting, packing, and moving. Giving away her belongings, along with her physical limitations, was very stressful for Edna. *"I had hoped to live and die in my own bed in my own home. I didn't want to leave. This move nearly killed me."*

A few years prior to the move, her husband had passed away and her children had moved far from home. She was lonely, but managed to keep contact with friends in her church. In the year preceding the move, her family provided her greatest source of satisfaction. Her children and grandchildren called and visited often and she proudly shared photographs of each of them as she talked about them. Her greatest stress was preparing for the move, because she was unable to do many things on her own. She experienced twelve significant life events in the year prior to the move, most prominently serious health issues, namely blood clots and a pulmonary embolism which resulted in lung damage. A close friend also died, she revised her personal habits, changed her recreational activities and living conditions, and experienced declines in church attendance and social activities. She had to change her dietary habits and had begun a 'cardiac' diet in order to provide her body with more protein. Her contact with family had greatly increased and her holiday celebrations were different than they had been in previous years. Due to the serious nature of her health problems, she spent a few weeks in the hospital and a rehabilitation nursing facility, followed by two weeks residing with her oldest daughter and then two weeks with her younger daughter. By the time she moved to the assisted living facility, she had experienced drastic changes in living conditions and health behaviors. In coping with stress, Edna reported using and reaping the greatest results from prayer and reading devotionals and other inspirational materials. She also listened to music for relaxation and talked with friends,

family, and professionals. She believed the most effective strategies were prayer and reading, both solitary activities.

Edna expressed a need for more sleep, often waking at 4am and having an average of five hours of sleep on a typical night. She found it hard to sleep during daylight hours and did not take regular naps. Her physicians had not prescribed sleeping medication, in part, because she had become dependent on pain killers for her polyneuropathy and because of her respiratory difficulties. At the time of her first interview, Edna was taking medications for gastric reflux, hypertension, bladder problems in addition to a progesterone cream, a blood thinner, and an antibiotic for a sore throat. She supplemented her medicines with calcium, a multivitamin, and vitamin B. She did not drink alcoholic beverages and had never been a smoker. She had a history of non-Hodgkins lymphoma but had remained symptom-free for twelve years. Due to years of chemotherapy, the veins in her arms and hands were severely sclerosed. Recent diagnoses included a clotting disorder, pulmonary emboli, and gastric reflux. Edna reported severe bodily pain from the polyneuropathy in her spine, and had experienced inabilities in most activities of daily living, with the exception of her ability to bathe, dress, and toilet by herself. Despite the chronic pain, Edna was mentally sound and had no serious problems with memory. She was enthusiastic about participating in the study and happy to have a visitor in her home.

At the time of the second interview, in her third month at the facility, the holidays were approaching. Edna had decorated her apartment as best she could by setting up displays of three separate nativity sets between the kitchen and living area. She had developed pulmonary hypertension and resumed taking painkillers for the polyneuropathy. The pain medications were adversely affecting her breathing which caused her speech to be broken in short sentences. She had only been able to eat with other residents in the dining room on two

occasions since moving into the facility. Residents, she reported, did not socialize in each others' apartments but only in the common areas and dining room. Edna felt as though no one knew her, aside from one neighbor who would stop in to check on her as a courtesy. She said the lack of social contact, in a facility rich in social opportunities, was the greatest stress for her. She lamented, *"I feel the need to mix and mingle more."*

Edna was surprised to feel somewhat adjusted to living in a small apartment. *"I realize that it is all the space I really need!"* This realization provided her with a great deal of satisfaction and she was pleased to be able to take care of herself independently, knowing she couldn't have done so in her previous home. She laughed as she related the observation of her granddaughter, *"Grandma, the bathroom is the biggest room in the whole apartment!"* She proudly had displayed photographs of her family on every wall and counter space. The apartment was neat and tidy. Edna spent most of her days lying on her side on the sofa while reading, watching television, or listening to the radio. She was pleased at the services available to her, including delivery of her medications from the pharmacy down the street.

Sleep was a luxury, as the pain remained constant and her respiratory illness was worsening. She was still sleeping approximately five hours a night. Her feelings of loneliness and isolation were distressing and the family wasn't visiting as often. Edna rationalized that they were busy, but it still was disheartening to spend her days and nights alone in the apartment. She had begun attending church nearby and had spoken with the minister about special accommodations for seating, given her spine problems. She reported frequent prayer as the most effective strategy for relieving stress. Watching television and reading were somewhat effective. Walking to the dining hall, on three occasions in the three months in residence, were effective in boosting her confidence and attempting to resolve her feelings of loneliness.

By the sixth month in the assisted living facility, Edna was planning to move again. She stated that the most difficult part of living there was the lack of contact with other residents and not being able to socialize with others. In a facility with many other residents, she didn't anticipate they wouldn't visit inside the apartments. Living in the facility was better than she had expected because of the attentiveness of the staff and services available onsite. It was also worse than she had expected due to the lack of social contact. In her efforts to 'mix and mingle' over her time in the facility, she tended to *"overdo it and it makes things worse for me. I couldn't go to the dining room on a regular basis and I wasn't able to meet or make friends with the other residents."*

Edna had been hospitalized for pulmonary hypertension and pneumonia between the third and sixth month. She was discharged from the hospital with oxygen. Within a few weeks, she had also been diagnosed with congestive heart failure and a urinary tract infection. She said she was feeling better, but was feeling some relief at being able to move to a slightly larger and less expensive apartment that was much closer to her daughters. She believed that they would come by more often because her new apartment was along their routes to work. In the meantime, she was praying and listening to music for comfort and relaxation.

Edna provided saliva samples each month while living in the assisted living facility and her cortisol profile is presented in Figure 5.11. Her peak levels were consistent across time, yet below the average and 95% confidence intervals. The peak and nadir values were very close, reflecting a flattened rhythm. Her pattern is indicative of a homeostatic mechanism that is not responsive and resembles that of a state of allostatic load. Edna had lived in the same community for much of her life. She had a patterned and predictable way of life until she developed cancer and then lost her husband. Both of these events were considerably stressful and taxing, and Edna found her previous ways of coping

with stress (i.e. prayer) were only moderately effective. She was distressed at changing her lifestyle, behavior, and living environment. The forced changes, including acceptance of the loss of her husband, and physical health declines took a toll on Edna's homeostatic processes and HPA functioning. The medications she had been taking over the previous decade likely contributed to dampening her HPA axis function. At the time of her move and throughout her six-month residence in assisted living, Edna's physiological profile reflects a state of allostatic load.

Summary. The in-depth case studies of Liz, Alison, and Edna provide a more comprehensive look at the phenomenon of stress in older women who relocate to congregate senior housing. The issues leading the women to the decision to relocate entailed significant stress, including perceptions of threat to their well-being -- physical, financial, or emotional. All had experienced health problems preceding the move, as well as changes in personal habits. Each of these women entered their new residence with expectations of what changes lay ahead, personal coping strategies, and hopes for their new home. The circumstances of the relocation decision and concurrent life events were quite different for each woman. All three reported prayer as an effective strategy, but only Liz was able to integrate socially into facility living and achieve physiological homeostasis as evidenced by her cortisol profile. Alison, who was caring for a very ill and dying spouse, was striving to find a balance and ways to alleviate stress. Despite her efforts, her cortisol levels continued to rise and she subsequently began to experience co-morbidities in her health. Afraid of being burdensome to others and exposing herself to losing peers, she tended to isolate herself and had little social or emotional support. Edna had experienced a life of secure routine which was disrupted by events beyond her control that caused significant distress. Years of struggling with cancer followed by the death of her spouse and changes in finances and personal health, meant that she was forced to make drastic changes in lifestyle and living environment. Edna was seeking

social contact and engagement, but was unable to achieve this in the assisted living facility. Her profile is indicative of allostatic load and reflects her body's inability to respond to stress.

CHAPTER SEVEN
DISCUSSION AND CONCLUSIONS

This study on relocation stresses among older women making a move into senior housing combines quantitative, qualitative, and clinical epistemologies and methodologies. The specific aims of the study were to:

1. investigate anticipated, experienced, and interpreted stresses associated with residential relocation for older women;
2. examine the relationships between psychosocial and physiological manifestations of stress adaptation; and
3. test a model combining biological and psychosocial research perspectives and methods in the investigation of residential relocation stress.

Specific Aim #1. Relocation, as expected, was considered to be a stressful experience for the women who participated in the study, although not all gave the same reasons for their move to be considered stressful. Some did not actively desire the move while others were struggling with other significant life events, changes in health status, and lifestyle changes in parallel with their move. All but one woman were able to identify positive aspects of the move and their new home at the time of the move and throughout the first six months in residence. In accordance with Lee's push-pull model (1966), factors leading to the move as well as amenities within the senior housing facility contributed to their decision to relocate. Health and functional decline were the most cited reasons for relocating and a surprising number (one-third of women) relocated to be nearer a relative needing care. This could be indicative of a new trend in elder relocation, particularly for the baby boom generation: relocating to be nearer older relatives

in order to provide a source of care. Social contacts and activities were the most important pull factors to the new residence.

When asked what had been the most stressful aspects of life since the move, significant life events were always mentioned. Issues related to relocation (or moving stresses), death of significant loved ones and friends, family issues, and health issues were the four thematic stresses discussed most frequently by participants. Anticipated and experienced lifestyle changes showed congruence in the domains which corresponded most closely with the “pull” factors toward a new home: contact with others and recreational activities. Increased social contact and participation in activities with others who shared an interest were identified as pull factors by many participants who had expected these to increase following the move. Therefore, it is not surprising that these activities would increase as participants were likely seek such contacts and participation. Many of the other anticipated lifestyle changes did not match experiences in the months post-move. Social conflicts increased, rather than the expected decrease, and most often occurred with other residents or with participants’ children. Others, such as the case study of Edna, became more isolated as a result of a lifestyle in which they remained in their apartments rather than participate in the communal social events (dining and social events) that represented the dominant culture of the facility. While many of these were caregivers, this often leads to the phenomenon of being isolated and lonely within a crowded setting. Volunteer work was expected to increase, but did not for the majority of women.

Specific Aim #2. Life events requiring a considerable amount of change in behavior or appraisal were reported both before and after the move. The majority experienced illness or injury in the months following the move, while over half had experienced the death of friends and neighbors, and stressful family issues. One quarter of the sample showed elevated cortisol patterns at the time of the move, indicating that they were experiencing stress and their HPA

axes were working properly to restore balance. Two women showed evidence of allostatic load at the time of the move as evidenced by flattened cortisol curves. These two women experienced more severe illnesses in the months after the move and took much longer to recover, if they did recover. Edna, who had been severely ill at the time of the move, had congestive heart failure among other serious conditions six-months post-move. Liz, who had diabetes also experienced broken bones and episodes where she would lose consciousness in the months post-move. Relationships between health and well-being were significant, with those in poorer health and more limited physical function showing increased negative affect and decreased positive affect.

Two distinct patterns were seen in the cortisol peak and nadir levels throughout the six month adaptation period. Some women showed increased reactivity during times where significant life stresses were occurring while others showed relatively constant cortisol levels regardless of the life stresses they indicated they were experiencing. All of the women reported stresses and coping strategies that appeared to be related to significant life events. While some women appeared to be more physiologically reactive to the stresses, no differences were seen in the number or type of coping strategies. However, the sample is quite small and may not allow enough statistical power to detect differences. It is interesting to note that two of the women who showed consistent cortisol levels throughout the adaptation period, Dottie and Grace, were of lower SES and had experienced many stressful life events through the years, including abusive marriages, poverty, and death of children. A larger sample and accounting for early life experiences and coping histories may provide more evidence of the influences of life experiences on physiological reactivity. Research has indicated that early life experiences and trauma affect HPA-axis activation and reactivity, accumulated lifetime stress, and disease states in adulthood (Heim, Newport, Wagner, Wilcox, Miller, & Nemeroff, 2002; Meinlschmidt & Heim, 2005; Turner-Cobb, 2005; Wingfield, 2004).

Many of the life events occurring in the months after the move would likely have occurred regardless of whether the participant had relocated. Given the changes required of participants in their new residences, the magnitude of the stress may have been intensified. For example, Alison who had lost her cat, her friends, and her neighbors during the first six months in her new home would have found the loss of her cat difficult in her previous home, but the exposure to more frequent deaths within the facility may have magnified the intensity of loss and feelings or fears of mortality.

Coping strategies were predominantly a mixture of distractive and activity based approaches, including staying busy, reading, and hobbies. Post-move, avoidance strategies were no longer reported and increased physical activities, such as walking and exercise, had been implemented. Social support, (talking to friends, family, or professionals) was also frequently used and rated as being highly effective. However, these strategies were not perceived as effective as solitary coping activities. Prayer was the preferred method of dealing with stress and considered to be the most effective strategy of all. Recent research has shown that people who pray frequently have lower cortisol responses to stress (Tartaro, Luecken, & Gunn, 2005).

Specific Aim #3. The integrative model of allostasis includes the psychosocial and physiological components associated with stress reactions and attempts toward resolution of the stress. Life experience, life events, psychological appraisal processes, behavioral responses, and physiological feedback mechanisms are inextricably linked. This study of relocation stress among older women was designed to capture each facet of the model of allostasis. This study takes a qualitative descriptive approach to analyzing the data. The results provide support for the theoretical model of allostasis in several domains. First, at the time of the move distinct patterns of diurnal cortisol release were observed, including elevated rhythms indicative of a stress

reaction and flattened diurnal cortisol rhythms indicative of allostatic load. Those with flattened rhythms had experienced extreme life stress in the years preceding the move which is consistent with the exhaustion of a homeostatic mechanism. Many of the women showed elevated cortisol at the time of the move and this corresponded with the move being a significant life stress. Other stressful life events, such as death of friends and relatives, anticipation of the sale of a home, and changes in health of family members raised cortisol levels, albeit temporarily. Most of the women showed physiological recovery after periods of elevated cortisol. Two women showed evidence of allostatic load at the time of the move. After six months, one participant's cortisol had returned to a more normal looking diurnal pattern (Liz), while the other woman's remained flattened (Edna). This participant with the flattened curve experienced multiple severe health conditions, including congestive heart failure, prolonged systemic infections, and a pulmonary embolism. She moved from the facility soon after her six month interview to an environment which provided more intensive supervision and care.

Perceptions of the move and stresses experienced preceding and following the move also affected physiological reactivity. It appears as though the women who had more life stresses (such as abuse) earlier in life were less reactive to stresses at the present time. Women who perceived the move as a significant stress had greater physiological reactivity at the time of the move. The number of coping strategies and use of proactive coping did not appear to be related to health, well-being, or cortisol reactivity. However, the sample for this study is relatively small and statistical power may not be adequate to detect such differences. A larger sample will likely provide more insight into the psychosocial and physiological processes associated with relocation stress and allow for more thorough testing of the theoretical model of allostasis.

Limitations. One of the most significant limitations to this study was the reliance on self-report health, sleep, and saliva collection times. It is known that

many older adults underestimate the amount of time spent in sleep, particularly in naps. Given the close relationship between diurnal hormone release and sleep patterns, a more strict data collection procedure (such as providing participants with electronic zietgebers) or a cross-sectional design in which participants stay over night in a clinical setting would help. However, such procedures were not feasible for this study. It is possible that the peak cortisol measures were not accurately obtained, particularly for the participant “Grace” (See Figure 5.7). It appears as though most monthly peak measures were too low for a typical peak measure, given that they fell below the lower 95% confidence interval.

Saliva collection could have benefited from repeated measures. In particular, collecting four time points (waking, one hour after waking, between 7-9 pm and bedtime) on two successive days may have provided greater insight into the typical diurnal rhythm. Such a procedure may have been most beneficial for those whose rhythms appear to be aberrant. Two of the aberrant rhythms (see Figure 5.3 for Vonda and Kathleen) may possibly be elevated normal rhythms with collection times slightly deviant from those requested.

The sample for this study was too small for adequate power on testing hypotheses. Therefore, regression analyses on cortisol reactivity using sleep duration and other quantitative measures were not possible. A larger sample would be beneficial to understanding the strength of the relationships among psychosocial and physiological stress and coping strategies and outcomes.

Contributions to the Literature. This study is novel in the approach to studying relocation among older women. The smaller sample size afforded the collection of a more comprehensive and in-depth investigation into the relocation experience. The combination of psychosocial and physiological data provide evidence of stress reactivity related to relocation and subsequent life stresses, some of which were directly related to living in congregate senior housing (i.e. death issues). Further, the results provide support to the theoretical model of allostasis. The women of this study show evidence of various states in the

allostasis model. Evidence of allostatic load, such as development of co-morbid health conditions co-occurring with a sustained flattened diurnal cortisol rhythms, in addition to those who appear to have achieved successful resolution of the challenges of life stress (such as social integration into facility life and reduced cortisol reactivity over time), while others continued to find a balance through continual changes in activities and, for some, caregiving responsibilities.

An interesting sub-group in this study were those who had relocated to be near a relative needing care. They did not differ from others in coping strategies, coping scores, or well-being. In the sixth month, they acknowledged that they felt their apartments were home, but had not socially integrated with others. One of these ladies stated, *"The social atmosphere is good. I'm satisfied. I'm not overly active. I mostly keep to myself. [Regarding stresses of caregiving] I keep it to myself around here. I don't want it to show and I don't want to be a burden or a pity case."* Another stated, *"I haven't gotten acquainted with others here, but I don't really feel the need."* Caregiving requires substantial time and energy investments, so it is not surprising that these women would not be as socially active. Research on older adults relocating to a CCRC has found activity participation is best explained using the theoretical principle known as Selective Optimization with Compensation (Kwon, 2001). Selective optimization with compensation (SOC), described by Baltes & Baltes (1990), is related to the Socioemotional Selectivity Theory (Carstensen, 1991, 1992) which posits that older adults' perception that time is limited results in direction of attention to emotional goals or optimizing time engaged in the most meaningful relationships. The lack of facility integration described by caregivers in their new residence lends support to both socioemotional selectivity theory and SOC. When the relative to whom they are providing care dies, however, it is conceivable that these women will feel more isolated and lonely.

Future directions. In order to more thoroughly address the stresses associated with relocation to senior housing among older women, a larger

sample with statistical power to test specific hypotheses is needed. In my post-doc this coming year, I intend to add additional subjects. I intend to add additional subjects in the next few years to test the following hypotheses:

- Participants who have relocated multiple times over their life course will more successfully anticipate the stresses associated with relocation and have better coping strategies with regard to the move. Additionally, experienced movers will demonstrate less physiological reactivity (i.e. lower cortisol levels, better immune function), and show increased stability in mood, sleep, and eating patterns in the third and sixth month post relocation.
- Participants whose pre-move anticipated relocation stresses match their post-move experienced stresses will adapt to their new environment more successfully as evidenced by both psychosocial (positive & negative affect, social integration, etc) and biomedical measures (lower cortisol, better immune function, sleep, and eating patterns).
- Participants whose anticipated and experienced stresses are incongruent post-move will show elevated cortisol responses post-move, greater difficulties with sleep and eating patterns, and will show greater immune suppression.
- Participants who have relocated to assisted living and report increase and/or more satisfying social support will adapt more successfully to their environment (i.e. higher social integration and mastery scores) and show declines in their cortisol response post-move.
- Participants whose anticipated and experienced stresses are incongruent will demonstrate increases in social support seeking and emotional lability.
- Participants who report more concurrent life stresses (i.e. illness/ death of a spouse, health changes) and higher IADL/ADL scores pre-move will demonstrate more difficulties in adaptation post-move (lower mastery and social integration scores, increased negative affect scores) than will those with fewer concurrent life stresses.
- Participants who have higher mastery and proactive coping scores pre-move will adapt better to their new environment (at three and six months post-move) as evidenced by cortisol and immune measures, social integration scores, social contacts, eating and sleeping patterns.

Future projects will build on the results of the current qualitative and quantitative components of this project. In particular, an intervention study will be undertaken to allow for more information regarding pre-move counseling and effects of staff facilitation of prospective resident contact with current residents on decision making, adaptation, and well-being. Ideally, prospective residents on facility waitlists will have several pre-move meetings with a facility/project liaison to discuss pre-move concerns. The liaison will provide comprehensive information regarding housing options and facility characteristics, facilitate meetings and meals with current residents, provide information on resources (i.e. realtors, moving companies, financing options) and services (i.e. home health agencies, on-site provisions and staff) available in the area. Comparisons to a control group who have not received the intervention resources will yield valuable insights into resident adaptation to senior housing with direct implications for both policy and practice.

EPILOGUE

Dissertations aren't supposed to be easy. Indeed this study on relocation stress among older women making a move to senior housing has been one of the most challenging projects on which I have worked. The very nature of my central research questions demanded additional coursework in fields ranging from physiology and endocrinology to phlebotomy (yes, the art and science of blood-sucking), pushing myself to master the new concepts and skills required to answer my own questions. It was an intense period of scholarly growth, and I can admit now that combining the physiological and psychosocial perspectives has provided a richer data set and a more complete picture of the adjustment process than I had originally imagined. Yet I still have a lot to learn, and I will need to continue building clinical research skills as my ongoing program of research unfolds.

The rewards of this study far transcend scholarly growth. I have met some of the kindest, most sincere and open women who unselfishly shared their stories (as well as their bodily fluids). Meeting with these women once a month, watching their new homes take shape, and hearing about their lives has been enjoyable. I had no idea of the degree of fondness I would develop for these wonderful ladies.

The challenges (read: stresses) associated with conducting a mixed method study were not what I had anticipated. The recruitment process was slow, much slower than I had expected, and explaining to potential participants why I needed their saliva, what I planned to do with it, and how their "spit" was related to moving wasn't as easy as I had thought either. Several potential participants had to be excluded for health and cognitive health limitations, and some women who made it into the study experienced major life events during the research. This may sound ridiculous since the study was about stresses, and life event measures were included in the interview and monthly data collection processes. But the sorts of life events that occurred, in the midst of data collection, defied my imagination. Let me explain. One of the participants – I will call her Dottie – had made friends with one of her neighbors and these two women did almost

everything together. One day when I stopped by to pick up Dottie's saliva specimens, her friend was also there and the three of us chatted about life in the facility. Dottie and her friend had been discussing the number of deaths in the building recently and how distressing it was to see the coroner's van parked out front on a nearly daily basis. Two months later, after Dottie's six month interview, I came by to pick up her last set of saliva samples. Dottie apologized profusely because she didn't have them finished and needed a new set of collection tubes. She explained that she had done the two morning collections but hadn't finished the rest because she found her dear friend had died when she went to meet her for lunch. I had become so very fond of Dottie, that her pain caused me pain. I've come to care deeply about these women in ways that I had never thought possible.

Each woman who graciously agreed to join in the research ended up imparting a great deal of wisdom. They had lived rich, full lives – marked with distinct periods of joy and sorrow – and their life experiences influenced not only their perceptions of life but also how they approached new stresses. These women had lost children, attended to the bedside of relatives and friends as they died, and been abused or abandoned by spouses. They had also experienced many joyous occasions, such as completing college, bearing children and watching them grow and flourish, contributing to their communities and seeing fruits of their labors. One theme I recognized during the first interviews with these women was this: As you age, your family becomes more important than ever. Many of the women were actively compiling and organizing family histories, including photographs and treasured mementos belonging to previous generations of families. Some were taking an active role in raising and caring for their grandchildren, while others had become completely estranged from their children. These women were fond of their friends, but their families were of the utmost importance.

On a personal level, this focus on family affected me deeply. A few years prior to the dissertation, I was diagnosed with “moderately-severe infertility” and had since been silently grieving for the family I might never have. I would leave the meetings with these women with mixed feelings; I was inspired by their strength and impressed with their devotion, yet found myself more than a bit envious of their ability to have and derive joy from their families. It made me wonder what my own future would look like and what I

was missing, which resulted in sadness and increased work determination. It came as a big surprise, therefore, when in February my husband and I discovered that we were expecting a baby. Although this news was quickly followed by grievous sorrow when the pregnancy resulted in miscarriage, I am, at the time of this writing, nearing the end of the first trimester of my second pregnancy. I couldn't be happier and more filled with hope than I am now.

My own perceptions, of my self and of my life, have changed considerably over the last year, and I am compelled to close with a thought instilled by my Dad. He used to tell me that our lives were the result of the decisions we made. In talking with my women during the course of this study, and with the mentors and advisors with whom I have had the pleasure of working, I see the truth in what my Dad once shared. Our lives are indeed filled with choices and opportunities, with obstacles and challenges, and our perceptions and attitudes influence not only how we approach these things but also how we interpret events after the fact. The last four years spent in graduate study have afforded many opportunities – coursework, research options, service on committees, grant writing, and professional contacts and friendships. At various points during my doctoral program each of these “opportunities” was initially perceived as an exciting avenue to pursue, then a challenge to intellectual development, eventually a cumbersome time burden, and finally a successful (or perhaps not so successful) accomplishment. I have no illusions that the next stage of my life will be better or easier, and in fact I anticipate more stresses, brought on by new and very different sets of opportunities, challenges, successes, and even failures. I only hope that these impending stresses can provide as much excitement and reward as did my doctoral experience, the end of which is marked by the end of this dissertation.

Appendix A:
Acronyms

Appendix: Acronyms

AARP -	American Association of Retired Persons
ACTH -	adrenocorticotrophic hormone
AD -	Alzheimer's disease
ADA -	American's with Disabilities Act
ALF -	Assisted Living Facility
ANOVA -	analysis of variance
AUC -	area under the curve
BMI -	body mass index
CCRC -	continuing care retirement community
COPD -	chronic obstructive pulmonary disease
CRH -	corticotrophin releasing hormone
DHEA -	dehydroepiandrosterone
GC -	glucocorticoids
GMR -	gross migration rate
GR -	glucocorticoid receptor
HPAA -	hypothalamic pituitary adrenal axis
MCI -	mild cognitive impairment
NSAIDS -	non-steroidal anti-inflammatory drugs
PANAS -	positive and negative affect scale
PCI -	Proactive Coping Inventory
PSS -	Perceived Stress Scale
SD -	standard deviation
SEM -	standard error of the mean
SPSS -	statistical package for the social sciences
SSRI -	selective serotonin reuptake inhibitors

Appendix B:

Semi-Structured Research Interview

Time One

Interview Schedule

Time One

Women's Health and Relocation Study

ID _____
Date _____

Life Style and Demographics

What is the name of the city in which you live? _____

From which you've recently moved? _____

Are you a Kentucky native?

- 1. Yes** **0. No**

If no, what do you consider to be your "home" state? _____
How long have you lived in Kentucky? _____

How many times have you moved residence since the age of 21? _____

What is your birthdate? _____ dd/mm/yyyy

Are you married, widowed, separated, divorced, or have you never been married?

- Married** **Widowed** **Separated/Divorced** **Single**

If married, how many years have you been in this relationship? _____
If widowed, how many years were you married? _____
How many years have you been widowed? _____

How many times have you been married? _____

How many times have you been widowed? _____

How many times have you been divorced? _____

Do you have children (living only)?

0. No **1. Yes**

How many children do you have? _____

How many of your children live within a 30-minute drive? _____

Are you a grandparent?

0. No **1. Yes**

What is the highest level of education you have completed?

- _____ **Grade school**
- _____ **High school**
- _____ **Some college**
- _____ **College**
- _____ **Graduate degree**

Do you drive?

0. No **1. Yes**

How often do you drive? _____ days per week/month

Why don't you drive?

- _____ **Eyesight**
- _____ **Health condition**
- _____ **Finances**
- _____ **No car**
- _____ **No license**
- _____ **Age**
- _____ **Never learned to drive**
- _____ **Spouse drives**
- _____ **Transportation provided by facility**
- _____ **Public transportation**
- _____ **Family discourages it**
- _____ **Does not want to drive**

Housing and Relocation

How long have you lived in your present home? _____

From where are/did you moving (move) ? (i.e. own home, rental home, apartment, etc)

Why did you choose this residence?

Why are you planning to move? What were the main reasons for leaving this home?

How did you hear about *name* assisted living?

Did anyone help in your decision to choose *name* assisted living? Who?

What are the main reasons for choosing *name* assisted living?

What do/did you believe will be the best about living at *name* assisted living?

What do/did you anticipate as being the most stressful part of this transition for you?

How do/did you anticipate you will approach these things (best and stressful parts)?

Do you anticipate changes in any of the following areas?

	Yes	No	Increase/ Decrease
Diet	Yes	No	
Sleep patterns	Yes	No	
Exercise	Yes	No	
Social activities	Yes	No	
Volunteer work/activities	Yes	No	
Church attendance	Yes	No	
Games/Cards	Yes	No	
Family Gatherings	Yes	No	
Holiday celebrations	Yes	No	
Recreational activities (reading, watching TV, concerts, sporting events)	Yes	No	
Contact with others	Yes	No	
Physician Visits	Yes	No	
Driving	Yes	No	
Shopping	Yes	No	
Social conflicts	Yes	No	
Interpersonal conflicts	Yes	No	
Other	Yes	No	

Is there anything you would like to add about your moving decision or the process of moving?



Social Interactions and Support

Do you attend religious services or watch them on TV?

- 0. Neither
- 1. Attend
- 2. Watch on TV
- 3. Both

How often do you see/talk with your children? _____ times per
week/day/month

You say you see/talk with your children X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

- 4. Often
- 3. Sometimes
- 2. Rarely
- 1. Never

How often do you see/talk with your friends? _____ times per
week/day/month

You say you see/talk with your friends X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

- 4. Often
- 3. Sometimes
- 2. Rarely
- 1. Never

How often do you see/talk with your neighbors? _____ times per
week/day/month

You say you see/talk with your neighbors X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

- 4. Often
- 3. Sometimes
- 2. Rarely
- 1. Never

How many trusted friends, relatives, or professionals do you feel as though you could count on if you needed help, advice, or someone in which you could confide? _____

In the past year, what has given you the most satisfaction in your life?

In the past year, what has been the most stressful part of your life?

What have you done to help alleviate the stress? How effective was it?

			Very Effective	Somewhat Effective	Not at all Effective
Relaxation	No	Yes			
Massage	No	Yes			
Yoga/Stretches/Breathing	No	Yes			
Pray/Meditate	No	Yes			
Reading	No	Yes			
Watching TV	No	Yes			
Gardening	No	Yes			
Hobbies	No	Yes			
Talking (professional)	No	Yes			
Talking to friends	No	Yes			
Talking to family	No	Yes			
Sleep	No	Yes			
Walking	No	Yes			
Exercise	No	Yes			
Church	No	Yes			
Volunteer work	No	Yes			
Bath/Shower	No	Yes			
Play games/cards	No	Yes			
Drink alcohol	No	Yes			
Keep busy	No	Yes			
Avoid the stress	No	Yes			
Withdraw/Be alone	No	Yes			
Find humor/laugh	No	Yes			
Cry	No	Yes			
Eat/Snack	No	Yes			
Other	No	Yes			

The following statements deal with reactions you may have to various situations. Indicate how true each of these statements is depending on how you feel about the situation.

1. I am a “take charge” person.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

2. I try to let things work out on their own.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

3. After attaining a goal, I look for another more challenging one.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

4. I like challenges and beating the odds.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

5. I visualize my dreams and try to achieve them.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

6. Despite numerous setbacks, I usually succeed in getting what I want.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

7. I try to pinpoint what I need to succeed.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

8. I always try to find a way to work around obstacles; nothing really stops me.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

9. I often see myself failing so I don't get my hopes up too high.

1. **Not at all true** 2. **Barely** 3. **Somewhat** 4. **Completely true**

10. I turn obstacles into positive experiences.

1. Not at all true 2. Barely 3. Somewhat 4. Completely true

11. If someone tells me I can't do something, you can be sure I will do it.

1. Not at all true 2. Barely 3. Somewhat 4. Completely true

12. When I experience a problem, I take the initiative in resolving it.

1. Not at all true 2. Barely 3. Somewhat 4. Completely true

13. When I have a problem, I usually see myself in a no-win situation.

1. Not at all true 2. Barely 3. Somewhat 4. Completely true

These next questions relate to other significant events that may have occurred in the last year. These don't happen to all people.

Life Events

In the past year did you separate from your mate?

0. No 1. Yes

When did you separate? _____ dd/mm/yyyy

Who initiated the separation?

0. Self 1. Spouse

Is the separation still going on?

0. No 1. Yes

If no, when did it end? _____ dd/mm/yyyy

Was this separation due to health/illness? (e.g. hospital or nursing home stay)

0. No 1. Yes

In the past year did a close family member die?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy
What was your relationship to this family member? _____
Would you consider this to be a close relationship?
Distant Somewhat distant Unsure Close Very Close

In the past year, did your spouse die?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy
Were you prepared for his/her passing?
0. Not at all Prepared 1. Somewhat Prepared 2. Prepared

In the past year did you have a serious injury or illness?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy
What happened/What type of illness? _____
Have you recovered?
0. No 1. Yes

In the past year did you get married?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy

In the past year did you leave a job or retire?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy
What was the job you left/retired from? _____

In the past year did your spouse leave a job or retire?

0. No **1. Yes** **2. N/A**

When did this occur? _____ dd/mm/yyyy
What was the job did your spouse retire/leave? _____

In the past year, were there big changes in the health or behavior of a family member?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy

In the past year did you gain a new family member (e.g. parent move in, new son/daughter-in-law)?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy

In the past year did you experience a major change in financial status?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy

In the past year did a close friend die?

0. No 1. Yes

When did this occur? _____ dd/mm/yyyy

In the past year did you experience an increase in the number of arguments with your spouse or children?

0. No 1. Yes

In the past year did you take out a mortgage or loan for another large purchase?

0. No 1. Yes

When did this occur? _____ dd/mm/yyyy

In the past year did your son or daughter leave home?

0. No 1. Yes

In the past year did you have any troubles with your in-laws?

0. No 1. Yes 2. N/A (no in-laws)

In the past year did you have any outstanding personal achievements?

0. No 1. Yes

What were your achievements? _____

In the past year did you have a major change in living conditions?

0. No 1. Yes

When did this occur? _____ dd/mm/yyyy

In the past year did you relocate?

0. No **1. Yes**

When did this occur? _____ dd/mm/yyyy

In the past year did you revise your personal habits?

0. No **1. Yes**

In the past year did you make changes in the usual types and/or amounts of recreation?

0. No **1. Yes**

In the past year did you make changes in your frequency of attendance or involvement in church activities?

0. No **1. Yes**

Did your frequency or activity increase or decrease?

1. Decrease **2. Increase**

In the past year did you make changes in your frequency of social activities?

0. No **1. Yes**

Did your frequency or activity increase or decrease?

1. Decrease **2. Increase**

In the past year have you experienced a major change in your sleeping habits?

0. No **1. Yes**

Did your sleep increase or decrease?

1. Decrease **2. Increase**

In the past year have you experienced a change in your eating habits?

0. No 1. Yes

What types of changes have you made?

Do you believe these changes are good?

0. No 1. Yes 2. Unsure

In the past year have you made changes in the frequency of family gatherings?

0. No 1. Yes

Did your frequency or activity increase or decrease?

1. Decrease 2. Increase

In the past year have you taken a vacation?

0. No 1. Yes

In the past year did you celebrate Christmas/Hannakah/Ramadan?

0. No 1. Yes

In the past year did you have any minor violations of the law (e.g. traffic tickets)?

0. No 1. Yes

Is there anything you would like to add about life events or stresses you're currently experiencing?

Physical and Emotional Well-Being

1) How much did you feel happy, excited, or content when you woke up?

0. Not at all 1. Somewhat 2. Moderately 3. Very
4. Extremely

2) How much did you feel worried, anxious, or fearful when you woke up?

0. Not at all 1. Somewhat 2. Moderately 3. Very
4. Extremely

What time did you awaken this morning? _____

How many hours of sleep did you have last night? _____

What time of the day do you usually awaken? _____ a.m./p.m.

How many hours of sleep do you get on a typical night? _____

How many times do you awaken during the night, on an average night? _____

Do you take naps regularly? **Yes** **No**

If yes, how long are the naps? _____

How restful is your sleep on a typical night?

Very Somewhat Not Very Not at all

How restful is your sleep compared to five years ago?

**Much less Somewhat less About the same Slightly better
Better**

Do you have trouble sleeping? **Yes No**

If yes, what type of trouble do you have? (i.e. difficulty falling asleep, staying asleep, etc.)

What has been the most stressful event of your day? _____

How stressful would you say this event has been?

0. Not at all 1. Somewhat 2. Moderately 3. Very

4. The most I've ever felt

How typical has this day been for you in terms of your sleep/wake cycle, activities, meals, and social interactions?

0. Not at all 1. Somewhat 2. Moderately 3. Very

How typical has this day been for you in terms of how busy, stressed, or pressured you feel?

0. Not at all 1. Somewhat 2. Moderately 3. Very

[BOOKLET] During the **past 30 days**, how much of the time have you felt the following:

<u>time</u>	<u>none</u>	<u>little</u>	<u>some</u>	<u>most</u>	<u>all</u>
a. cheerful	1	2	3	4	5
b. in good spirits	1	2	3	4	5
c. so sad nothing could cheer you up	1	2	3	4	5
d. nervous	1	2	3	4	5
e. extremely happy	1	2	3	4	5
f. restless or fidgety	1	2	3	4	5
g. satisfied	1	2	3	4	5
h. full of life	1	2	3	4	5
i. hopeless	1	2	3	4	5
j. that everything was an effort	1	2	3	4	5
k. calm and peaceful	1	2	3	4	5
l. worthless	1	2	3	4	5
m. that life is interesting & challenging	1	2	3	4	5
n. you were losing or misplacing things	1	2	3	4	5
o. it's difficult to finish things you've started	1	2	3	4	5
p. able to get really absorbed in a task	1	2	3	4	5
q. making decisions is difficult	1	2	3	4	5
r. energetic and excited about what you are doing	1	2	3	4	5
s. on top of the world	1	2	3	4	5

Health Status and Health Behavior

Are you presently taking any prescription medications?

Yes **No**

What medications are you taking and what are they used to treat?

Are you presently taking estrogen or hormone replacement therapy?

Yes **No**

If no, have you ever taken hormone/estrogen replacement therapy?

Yes **No**

If yes, How long ago did you stop taking it?
_____ days/months/years

Are you presently taking any over-the-counter medications?

Yes **No**

What are you taking and what are they used to treat?

Are you presently taking any supplements or alternative medicine treatments?

Yes

No

What are you taking and what are they used to treat?

Are you presently taking predisone or other corticosteroid?

Yes

No

Do you drink alcoholic beverages?

Yes

No

What do you typically drink? _____

How often? _____

What amount? _____

Do you smoke?

Yes

No

How much do you smoke? _____

How many years have you been a smoker? _____

Were you ever a smoker?

Yes

No

When did you quit? _____

How many years did you smoke? _____

Do you typically exercise?

Yes

No

What types of exercise do you do?

How often?

Have you engaged in any exercise today?

Yes

No

What type of exercise did you do?

Have you ever been diagnosed with any of the following health conditions?

	Yes/No	When?	Currently under care of physician?	Specify
Allergies/ Asthma			1. Yes 0. No	
Arthritis			1. Yes 0. No	
Angina			1. Yes 0. No	
Heart Disease/ Attack			1. Yes 0. No	
Hypertension			1. Yes 0. No	
Diabetes			1. Yes 0. No	
Colitis/IBS			1. Yes 0. No	
Ulcers			1. Yes 0. No	
Liver Disease			1. Yes 0. No	
Kidney Disease			1. Yes 0. No	
Thyroid Dysfunction			1. Yes 0. No	
Osteoporosis/Osteopenia			1. Yes 0. No	
Migraine Headaches			1. Yes 0. No	
Dementia/ Alzheimer			1. Yes 0. No	
COPD/Emphysema			1. Yes 0. No	
Other Respiratory			1. Yes 0. No	
Gastric Reflux			1. Yes 0. No	
Other Stomach			1. Yes 0. No	
Other Intestinal			1. Yes 0. No	
Other Endocrine			1. Yes 0. No	
Broken bone			1. Yes 0. No	
Multiple Sclerosis			1. Yes 0. No	
Fibromyalgia			1. Yes 0. No	
Other Musculoskeletal			1. Yes 0. No	
Other Cardiovascular			1. Yes 0. No	
Endometriosis			1. Yes 0. No	
Other Reproductive			1. Yes 0. No	
Cancer (type & location)			1. Yes 0. No	
			1. Yes 0. No	
			1. Yes 0. No	
			1. Yes 0. No	
			1. Yes 0. No	
Stroke/TIA/Ischemia			1. Yes 0. No	

Has your health limited your ability to do any of the following activities? If yes, how long has it limited you?

<u>Long?</u>	<u>YES</u>	<u>NO</u>	<u>How</u>
a. The kinds or amount of vigorous activities you can do, like lifting heavy objects, running, or participating in strenuous sports?	2	1	_____
b. The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries, or bowling?	2	1	_____
c. Climbing one flight of stairs	2	1	_____
d. Walking uphill or climbing a few flights of stairs	2	1	_____
e. Bending, lifting, or stooping	2	1	_____
f. Walking one block	2	1	_____
g. Walking several blocks	2	1	_____
h. Walking one mile	2	1	_____
i. Eating, dressing, bathing or using the toilet	2	1	_____

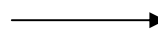
How much bodily pain have you had during the **past 4 weeks**?

0. none 1. very mild 2. mild 3. moderate 4. severe

Does your health keep you from working at a job or doing work around the house?

0. No

1. Yes



For how long? _____

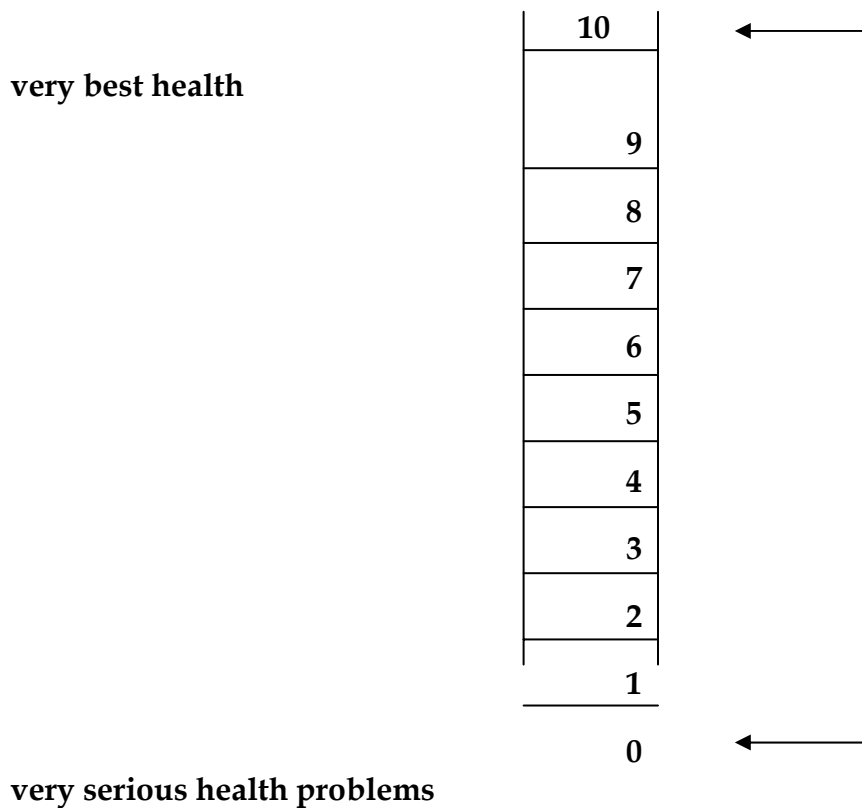
Have you been unable to do certain kinds or amounts of work because of your health?

0. No

1. Yes

→ For how long? _____

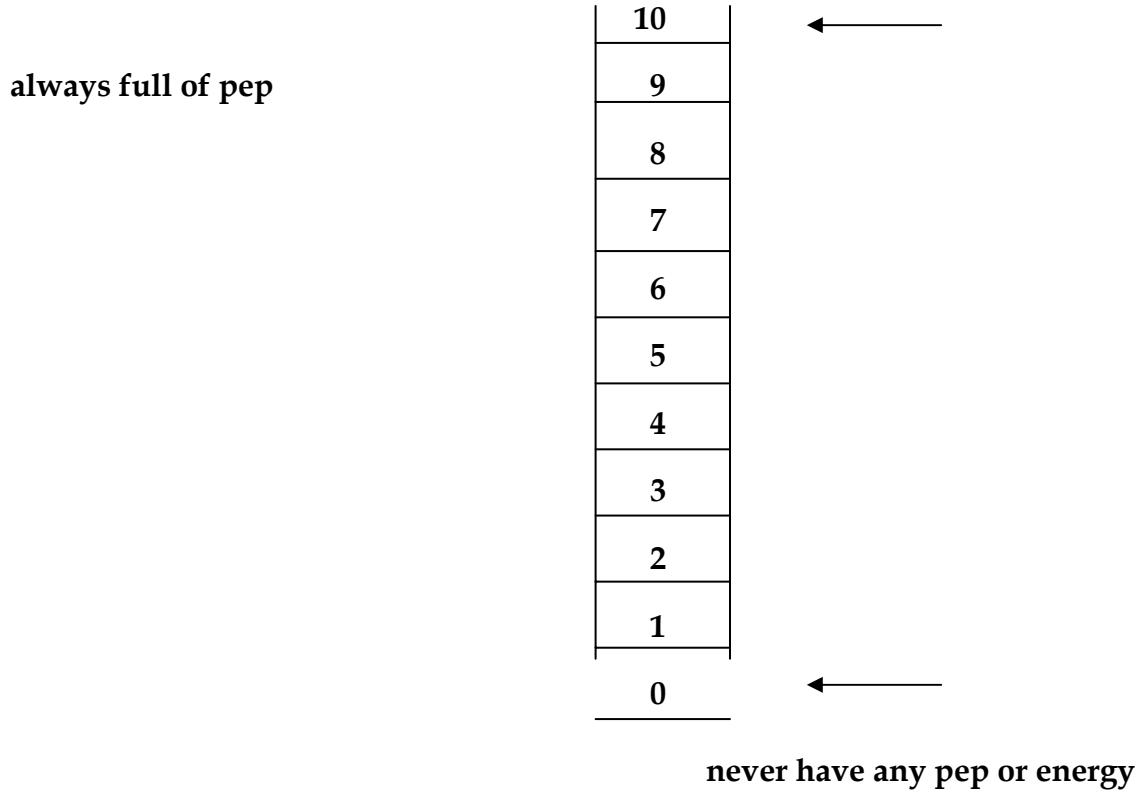
[BOOKLET] Which step on the ladder indicates how your health has been lately?



How tall are you? _____ feet _____ inches

About how much do you weigh? _____ lbs

[BOOKLET] Which step on the ladder indicates how much pep or energy you have lately?



When was the last time you had a meal?

What did you eat in the last 24 hours?

Do you ever have cravings for certain foods?

0. No **1. Yes**

Which foods? _____

Do you ever have cravings for foods at different times of the day? (e.g. bedtime)

0. No **1. Yes**

Explain _____

Is there anything you'd like to add about your health?

Is there anything else you would like to share?

Yes

No

Notes on blood collection

Appendix C:

Semi Structured Research Interview

Time Two

Interview Schedule

Time Two

Biophysical and Psychosocial Models of Stress in Relocation

ID _____

Date _____

Date of Saliva Collection _____

Time of blood collection _____

Housing and Relocation

In the last three months, have you experienced changes in any of the following areas?

	Yes	No	Increase/ Decrease
Diet	Yes	No	
Sleep patterns	Yes	No	
Exercise	Yes	No	
Social activities	Yes	No	
Volunteer work/activities	Yes	No	
Church attendance	Yes	No	
Games/Cards	Yes	No	
Family Gatherings	Yes	No	
Holiday celebrations	Yes	No	
Recreational activities (reading, watching TV, concerts, sporting events)	Yes	No	
Contact with others	Yes	No	
Physician Visits	Yes	No	
Driving	Yes	No	
Shopping	Yes	No	
Social conflicts	Yes	No	
Interpersonal conflicts	Yes	No	
Other	Yes	No	

Is there anything else you would like to share about your thoughts on this move?

Yes

No

Social Interactions and Support

For the child you see/talk to most often, how often do you see/talk with your children?
_____ times per week/day/month

You say you see/talk with your child X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

4. Often 3. Sometimes 2. Rarely 1. Never

How often do you see/talk with your friends? _____ times per
week/day/month

You say you see/talk with your friends X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

4. Often 3. Sometimes 2. Rarely 1. Never

How often do you see/talk with your neighbors? _____ times per
week/day/month

You say you see/talk with your neighbors X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

4. Often 3. Sometimes 2. Rarely 1. Never

In the past three months, what has given you the most satisfaction in your life?

In the past three months, what has been the most stressful part of your life?

What have you done to help alleviate the stress? How effective was it?

			Very Effective	Somewhat Effective	Not at all Effective
Relaxation	No	Yes			
Massage	No	Yes			
Yoga/Stretches/Breathing	No	Yes			
Pray/Meditate	No	Yes			
Reading	No	Yes			
Watching TV	No	Yes			
Gardening	No	Yes			
Hobbies	No	Yes			
Talking (professional)	No	Yes			
Talking to friends	No	Yes			
Talking to family	No	Yes			
Sleep	No	Yes			
Walking	No	Yes			
Exercise	No	Yes			
Church	No	Yes			
Volunteer work	No	Yes			
Bath/Shower	No	Yes			
Play games/cards	No	Yes			
Drink alcohol	No	Yes			
Keep busy	No	Yes			
Avoid the stress	No	Yes			
Withdraw/Be alone	No	Yes			
Find humor/laugh	No	Yes			
Cry	No	Yes			
Eat/Snack	No	Yes			
Other	No	Yes			

What time did you awaken this morning? _____

How many hours of sleep did you have last night? _____

What time of the day do you usually awaken? _____ a.m./p.m.

How many hours of sleep do you get on a typical night? _____

These next questions relate to other significant events that may have occurred in the last year. These don't happen to all people.

Life Events

Please mark any of the events that you have experienced in the last year. *

- death of a spouse
- divorce
- marital separation from mate
- detention in jail or other institution
- death of a close family member
- major personal injury or illness
- marriage
- fired from job
- marital reconciliation
- retirement
- major change in the health or behavior of a family member
- pregnancy
- sexual difficulties
- gaining a new family member (e.g. birth, adoption, parent moving in, etc)
- major business re-adjustment
- major change in financial status
- death of a close friend
- change to a different line of work
- major change in the number of arguments with spouse/significant other
- taking out a mortgage or loan for a major purchase
- foreclosure on mortgage or loan
- major change in responsibilities at work
- son or daughter leaving home (e.g. marriage, attending college)
- trouble with in-laws
- outstanding personal achievement
- spouse beginning or ceasing to work outside the home
- beginning or ceasing formal schooling
- major change in living conditions
- revision of personal habits (dress, manners, associations)
- trouble with boss/supervisor
- major change in working hours or working conditions
- change in residence
- change to a new school
- major change in usual type and/or amount of recreation
- major change in church activities (a lot more or a lot less)
- major change in social activities (a lot more or a lot less)
- taking out a mortgage or loan for a lesser amount (e.g. car, freezer, TV, etc.)
- major change in sleeping habits
- major change in eating habits
- major change in the number of family get-togethers

- _____ vacation
- _____ Christmas season
- _____ minor violations of the law (e.g. traffic tickets)

Physical and Emotional Well-Being

1) How much did you feel happy, excited, or content when you woke up?

- 0. Not at all 1. Somewhat 2. Moderately 3. Very**
4. Extremely

2) How much did you feel worried, anxious, or fearful when you woke up?

- 0. Not at all 1. Somewhat 2. Moderately 3. Very**
4. Extremely

What has been the most stressful event of your day? _____

How stressful would you say this event has been?

- 0. Not at all 1. Somewhat 2. Moderately 3. Very**
4. The most I've ever felt

How typical has this day been for you in terms of your sleep/wake cycle, activities, meals, and social interactions?

- 0. Not at all 1. Somewhat 2. Moderately 3. Very**

How typical has this day been for you in terms of how busy, stressed, or pressured you feel?

- 0. Not at all 1. Somewhat 2. Moderately 3. Very**

1. In the last month, how often have you been upset because of something that happened unexpectedly?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

3. In the last month, how often have you felt nervous and "stressed"?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

5. In the last month, how often have you felt that things were going your way?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

7. In the last month, how often have you been able to control irritations in your life?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

8. In the last month, how often have you felt that you were on top of things?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

9. In the last month, how often have you been angered because of things that were outside of your control?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

0. never 1. almost never 2.sometimes 3.fairly often 4.very often

PSS-10 scores are obtained by reversing the scores on the four positive items, e.g., 0=4, 1=3, 2=2, etc. and then summing across all 10 items. Items 4,5, 7, and 8 are the positively stated items.

[BOOKLET] During the **past 30 days**, how much of the time have you felt the following:

	<u>none</u>	<u>little</u>	<u>some</u>	<u>most</u>	<u>all time</u>
a. cheerful	1	2	3	4	5
b. in good spirits	1	2	3	4	5
c. so sad nothing could cheer you up	1	2	3	4	5
d. nervous	1	2	3	4	5
e. extremely happy	1	2	3	4	5
f. restless or fidgety	1	2	3	4	5
g. satisfied	1	2	3	4	5
h. full of life	1	2	3	4	5
i. hopeless	1	2	3	4	5
j. that everything was an effort	1	2	3	4	5
k. calm and peaceful	1	2	3	4	5
l. worthless	1	2	3	4	5
m. that life is interesting & challenging	1	2	3	4	5
n. you were losing or misplacing things	1	2	3	4	5
o. it's difficult to finish things you've started	1	2	3	4	5
p. able to get really absorbed in a task	1	2	3	4	5
q. making decisions is difficult	1	2	3	4	5
r. energetic and excited about what you are doing	1	2	3	4	5
s. on top of the world	1	2	3	4	5

Health Status and Health Behavior

In the past three months have you have you made changes in the prescription medications you were taking?

Yes **No**

What medications are you taking and what are they used to treat?

Are you presently taking any over-the-counter medications?

Yes **No**

What are you taking and what are they used to treat?

Are you presently taking any supplements or alternative medicine treatments?

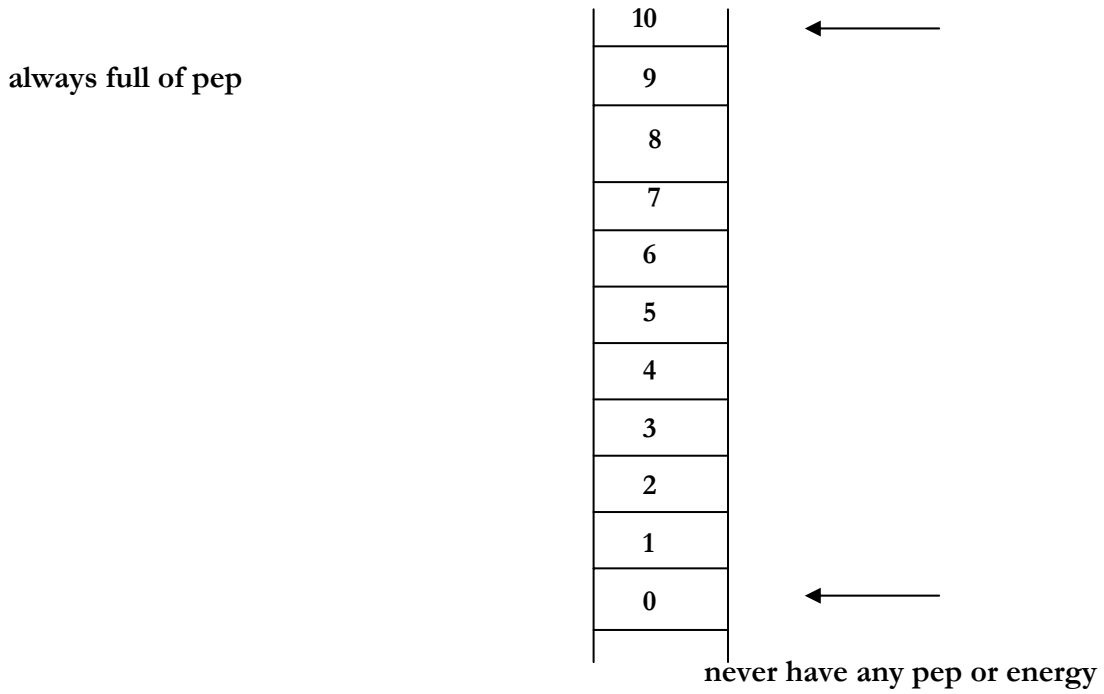
Yes **No**

What are you taking and what are they used to treat?

[BOOKLET] Which step on the ladder indicates how your health has been lately?

best health	10	←	very
	9		
	8		
	7		
	6		
	5		
	4		
	3		
	2		
	1		
very serious health problems	0	←	

[BOOKLET] Which step on the ladder indicates how much pep or energy you have lately?



When was the last time you had a meal?

What did you eat in the last 24 hours?

Do you ever have cravings for certain foods?

0. No **1. Yes**

Which foods? _____

Notes on blood collection

Appendix D:

Semi Structured Research Interview

Time Three

Interview Schedule

Time Three



Women's Health and Relocation Study

ID _____

Date _____

Date of Saliva Collection _____

Time of blood collection _____

Housing and Relocation

You've lived at *name* for six months now.

What has been the best part of living here?

Is this what you had expected to be the best part of life at *name*?

Yes **No** **Unsure**

Is living here better or worse than you had anticipated?

Better **Unsure** **Worse** **Both (please explain)**

What has been the most difficult part of living here?

Did you anticipate that these difficulties would occur?

Yes **No** **Unsure**

Have the difficulties been lesser or worse than you had anticipated?

Lesser **Unsure** **Worse** **Both (please explain)**

Are most of the difficulties due to life at *name facility* or external life factors?

Facility Living **Other Life Events**

Satisfaction

Please rate your satisfaction as yes (3), no (1), or somewhat (2).

Are you satisfied with . . .

1, 2, 3	
	Apartment layout
	Storage space
	Space for displaying pictures/artwork etc.
	Laundry facilities
	Kitchen space
	Heating/ AC
	Bathroom facilities
	Windows/lighting
	Floor coverings
	The amount of control you have over the environment
	Levels of noise from neighbors
	Maintenance services
	Cleaning/housekeeping services
	Management
	Social environment
	Social activities
	Neighbors
	Area surrounding facility/complex
	Access to shopping and entertainment
	Transportation services
	Recreation opportunities
	Living near older adults
	Proximity to children/family
	Proximity to physicians and services
	Proximity to recreation/entertainment/community events
If you could change any aspect of living at *name*, what would you change and why?	

Sense of Community

Please rate the following items as yes (3), no (1), or somewhat (2).

1, 2, 3	Do you feel as though . . .
	This is your home?
	You belong here?
	There is a sense of community among residents here?
	You could count on your neighbors for assistance?
	There are people who share your interests here?
	There are people who share your concerns here?
	There is a community of like-minded individuals here?
	There are unwritten social rules?
	There are cliques in the facility?
	The management know you and your needs?
	Your opinions and suggestions are heard by the administration?
	You have control over your environment?
	You have control over your activities?
	You made the right decision to move here?
	You would make the same decision if you had it to do over again?

Social Environment

Are there unwritten social rules here at *name*?

Yes **No** **Unsure**

If yes, what are these unwritten rules? _____

Are there social cliques in the community?

Yes **No** **Unsure**

If yes, how would you describe the cliques? _____

How would you describe your relationship with the other residents here? (If multiple mentions, rank them)

_____ Acquaintances _____ Like Family

_____ Neighbors _____ Other _____

_____ Friends

In the last three months, have you experienced changes in any of the following areas?

	Yes	No	Increase/ Decrease
Diet	Yes	No	
Sleep patterns	Yes	No	
Exercise	Yes	No	
Social activities	Yes	No	
Volunteer work/activities	Yes	No	
Church attendance	Yes	No	
Games/Cards	Yes	No	
Family Gatherings	Yes	No	
Holiday celebrations	Yes	No	
Recreational activities (reading, watching TV, concerts, sporting events)	Yes	No	
Contact with others	Yes	No	
Physician Visits	Yes	No	
Driving	Yes	No	
Shopping	Yes	No	
Social conflicts	Yes	No	
Interpersonal conflicts	Yes	No	
Other	Yes	No	

In the past six months, what has given you the most satisfaction in your life?

In the past six months, what has been the most stressful part of your life?

Health and Well-Being

In the last six months, have you had an increase in physical illness(es)?

Yes No Not Sure

What types of illness have you experienced?

	Yes/No	Recovered?	Notes
Allergies/ Asthma	1. Yes 0. No	1. Yes 0. No	
Arthritis	1. Yes 0. No	1. Yes 0. No	
Angina	1. Yes 0. No	1. Yes 0. No	
Heart Disease/ Attack	1. Yes 0. No	1. Yes 0. No	
Hypertension	1. Yes 0. No	1. Yes 0. No	
Diabetes	1. Yes 0. No	1. Yes 0. No	
Colitis/IBS	1. Yes 0. No	1. Yes 0. No	
Ulcers	1. Yes 0. No	1. Yes 0. No	
Liver Disease	1. Yes 0. No	1. Yes 0. No	
Kidney Disease	1. Yes 0. No	1. Yes 0. No	
Thyroid Dysfunction	1. Yes 0. No	1. Yes 0. No	
Osteoporosis/Osteopenia	1. Yes 0. No	1. Yes 0. No	
Migraine Headaches	1. Yes 0. No	1. Yes 0. No	
Dementia/ Alzheimer	1. Yes 0. No	1. Yes 0. No	
COPD/Emphysema	1. Yes 0. No	1. Yes 0. No	
Other Respiratory	1. Yes 0. No	1. Yes 0. No	
Gastric Reflux	1. Yes 0. No	1. Yes 0. No	
Other Stomach	1. Yes 0. No	1. Yes 0. No	
Other Intestinal	1. Yes 0. No	1. Yes 0. No	
Other Endocrine	1. Yes 0. No	1. Yes 0. No	
Broken bone	1. Yes 0. No	1. Yes 0. No	
Multiple Sclerosis	1. Yes 0. No	1. Yes 0. No	
Fibromyalgia	1. Yes 0. No	1. Yes 0. No	
Other Musculoskeletal	1. Yes 0. No	1. Yes 0. No	
Other Cardiovascular	1. Yes 0. No	1. Yes 0. No	
Endometriosis	1. Yes 0. No	1. Yes 0. No	
Joint Pain	1. Yes 0. No	1. Yes 0. No	
Cancer (type & location)	1. Yes 0. No	1. Yes 0. No	
Surgery (type & location)	1. Yes 0. No	1. Yes 0. No	
	1. Yes 0. No	1. Yes 0. No	
	1. Yes 0. No	1. Yes 0. No	
	1. Yes 0. No	1. Yes 0. No	
Stroke/TIA/Ischemia	1. Yes 0. No	1. Yes 0. No	

Mental Health and Well-Being

	Yes	No	Notes
1. Are you basically satisfied with your life?	Yes	No	
2. Have you dropped many of your activities and interests?	Yes	No	
3. Do you feel that your life is empty?	Yes	No	
4. Do you often get bored?	Yes	No	
5. Are you in good spirits most of the time?	Yes	No	
6. Are you afraid that something bad is going to happen to you?	Yes	No	
7. Do you feel happy most of the time?	Yes	No	
8. Do you often feel helpless?	Yes	No	
9. Do you prefer to stay home, rather than going out and doing new things?	Yes	No	
10. Do you feel you have more problems with memory than most?	Yes	No	
11. Do you think it's wonderful to be alive now?	Yes	No	
12. Do you feel pretty worthless the way you are now?	Yes	No	
13. Do you feel full of energy?	Yes	No	
14. Do you feel that your situation is hopeless?	Yes	No	
15. Do you think that most people are better off than you are?	Yes	No	

How often do you see/talk with your children? _____ times per
week/day/month

You say you see/talk with your children X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

4. Often 3. Sometimes 2. Rarely 1. Never

How often do you see/talk with your friends? _____ times per
week/day/month

You say you see/talk with your friends X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

4. Often 3. Sometimes 2. Rarely 1. Never

How often do you see/talk with your neighbors? _____ times per
week/day/month

You say you see/talk with your neighbors X times per d/m/y. Would you consider this to be often, sometimes, rarely, or never?

- 4. Often 3. Sometimes 2. Rarely 1. Never**

Please use this list of common human traits to describe yourself as accurately as possible. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex and of roughly your same age.

Before each trait, please write a number indicating how accurately that trait describes you, using the following rating scale:

=====

Extremely...Very...Moderately...Slightly....Slightly...Moderately...Very...Extremely

INACCURATE ACCURATE

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

=====

Rating	Trait	Rating	Trait	Rating	Trait	Rating	Trait
	Bashful		Energetic		Moody		Systematic
	Bold		Envious		Organized		Talkative
	Careless		Extraverted		Philosophical		Temperamental
	Cold		Fretful		Practical		Touchy
	Complex		Harsh		Quiet		Uncreative
	Cooperative		Imaginative		Relaxed		Unenvious
	Creative		Inefficient		Rude		Unintellectual
	Deep		Intellectual		Shy		Unsympathetic
	Disorganized		Jealous		Sloppy		Warm
	Efficient		Kind		Sympathetic		Withdrawn

Are there any questions you think I should have asked but didn't?

Yes

No

Appendix E:

Saliva Sample Collection Forms



Women's Relocation Study Saliva Sample Collection

Instructions

There are six salivettes, or cotton pieces designed to collect saliva, and containers in the attached packet. If you have any questions during your collection day, please don't hesitate to call Heidi at 859-257-1450 ext 80198. The containers are marked with the time of day you are to collect the saliva samples. At the prescribed time, please:

- 1) remove the cotton from the plastic tube and place under your tongue or in the space between your cheek and upper gums until the cotton is saturated with saliva.
- 2) Do not cough on or chew the cotton while it is in your mouth, although you may open and close your mouth in order to stimulate the salivary glands.
- 3) Place the saturated cotton back in the plastic container and refrigerate.

Times for collection:

- 1) As soon as you awaken in the morning. You may want to keep the salivette on your bedside table and collect the sample before you get out of bed. When you awaken in the morning, sit on the edge of the bed before putting the cotton under your tongue. Do not collect the sample lying down.
- 2) One hour after awakening
- 3) Between 1 and 2 pm
- 4) Between 4 and 6 pm
- 5) Between 6 and 9 pm
- 6) Bedtime

Please answer the following questions on the day of your collection.

1. What is today's date? _____
2. How many times did you awaken last night? _____
3. Approximately what time was it when you woke up each time? _____

4. Did you eat or drink anything before returning to bed each time you awoke?

Yes **No**

a. If yes, what did you have to eat/drink?

5. How typical was the amount of sleep you had last night? (please circle)

Less than normal **About Normal** **More than normal**

6. How typical was the quality of sleep you had last night?

Less than normal **About Normal** **More than normal**

7. How rested did you feel this morning?

Very **Moderately** **Slightly** **Not at all**

What times did you collect your saliva samples?

#1 _____ **AM / PM**

#2 _____ **AM / PM**

#3 _____ **PM**

#4 _____ **PM**

#5 _____ **PM**

#6 _____ **AM / PM**



Women's Relocation Study Monthly Saliva Sample Collection

Instructions

There are two salivettes, or cotton pieces designed to collect saliva, and containers in the attached packet. If you have any questions during your collection day, please don't hesitate to call Heidi at 859-257-1450 ext 80198. The containers are marked with the time of day you are to collect the saliva samples. At the prescribed time, please:

- 4) remove the cotton from the plastic tube and place under your tongue or in the space between your cheek and upper gums until the cotton is saturated with saliva.
- 5) Do not cough on or chew the cotton while it is in your mouth, although you may open and close your mouth in order to stimulate the salivary glands.
- 6) Place the saturated cotton back in the plastic container and refrigerate.

Times for collection:

- 7) Within the first hour after waking
- 8) Bedtime

Please answer the following questions on the day of your collection.

8. What is today's date? _____
9. How many times did you awaken last night? _____
10. Approximately what time was it when you woke up each time? _____
11. Did you eat or drink anything before returning to bed each time you awoke?

Yes

No

- a. If yes, what did you have to eat/drink?

12. How typical was the amount of sleep you had last night? (please circle)

Less than normal About Normal More than normal

13. How typical was the quality of sleep you had last night?

Less than normal About Normal More than normal

14. How rested did you feel this morning?

Very Moderately Slightly Not at all

What times did you collect your saliva samples?

#1 _____ AM / PM

#2 _____ AM / PM

NOTES (INCLUDING MEDICATION CHANGES):

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- Waldron, V.R., Gitelson, R., & Kelley, D.L. (2005). Gender differences in social adaptation to a retirement community: Longitudinal changes and the role of mediated communication. *Journal of Applied Gerontology*, 24 (4): 283-298.
- Walters, W.H. (2002). Place characteristics and later-life migration. *Research on Aging*, 24 (2): 243-277.
- Ward, R.A., Spitze, G.D., & Sherman, S.R. (2005). Attraction to intergenerational housing on a university campus. *Journal of Housing for the Elderly*, 19 (1): 93-111.
- Watkins, J.F. (1990). Appalachian elderly migration: Patterns and implications. *Research on Aging*, 12 (4): 409-429.
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- Wheaton, B. (1997). The nature of chronic stress. In B.H. Gottlieb (Ed). *Coping with Chronic Stress*, pp 43-73. Plenum Press: New York.
- Wilder, R.L. (1998). Hormones, pregnancy and autoimmune diseases. *Annals of the New York Academy of Sciences*, 840: 45-50.
- Wingfield, J.C. (2004). Allostatic load and life cycles: Implications for neuroendocrine control mechanisms. In Schulkin, J. (Ed.) *Allostasis, Homeostasis, and the Costs of Physiological Adaptation*. Cambridge, UK: Cambridge University Press.
- Workman, E.A. (1998). The measurement of stress and its effects. In Hubbard, J & Workman, E.A. (Eds). *The Handbook of Stress Medicine*.

Curriculum Vitae

Curriculum Vita
HEIDI HARRIMAN EWEN
(formerly Holmes)

Born: August 28, 1972
Scott Air Force Base, Illinois

EDUCATION

Master of Arts in Experimental Psychology, Statistics Minor
University of Tennessee, Knoxville, TN. 1996.
Master's Thesis: The Relationship of Coping Styles and
Depression to Cardiovascular Health in Women after
Menopause.

Bachelor of Arts in Psychology
Eastern Illinois University, Charleston, IL. 1994.

RESEARCH EXPERIENCE

- 2005-2006 Mentored Student, Mentored Medical/Dental Student Clinical
Research Program, www.mc.uky.edu/gcrc
- 2005-2006 NIMH Pre-Doctoral Research Fellow in Medical Behavioral Science,
Department of Behavioral Sciences. Mentor: John F. Wilson, Ph.D,
Vice-Chair.
- 2002-Present Co-Principal Investigator, The Progressive Experiences of
Gerontology Ph.D. Students: A Cohort Analysis of the Incoming
Classes of 2002 and 2003.
- 2003-2004 Graduate Research Assistant, Department of Behavioral Science,
University of Kentucky, Lexington, KY.
<http://www.mc.uky.edu/behavioralscience/>

- 2003-2004 Project Coordinator / Graduate Research Assistant
Institutional Permeability in Long-Term Care, NIH Grant R01
HS012181-01. (<http://www.mc.uky.edu/Permeability>)
- 1999-2003 Project Manager / Director of Data Collection, Pathways to Life
Quality Study (<http://www.pathwayslifequality.org/>)
Gerontology Institute, Ithaca College, Ithaca, NY 14850.
- 1998-1999 Visiting Coordinator of Research, Children and Family Research
Center, University of Illinois at Urbana-Champaign.
(<http://cfrcwww.social.uiuc.edu/>).
- 1993-1994 Undergraduate Laboratory Manager, Eastern Illinois University,
Charleston, IL 61920.

TEACHING EXPERIENCE

- 1997-1998 Visiting Instructor of Psychology, Eastern Illinois University,
Charleston, IL 61920.
- 1995-1996 Graduate Teaching Associate, University of Tennessee,
Knoxville, TN 37996.

Courses Taught:

- Introductory Psychology
- Physiological Psychology
- Basic Statistics

PROFESSIONAL AFFILIATIONS

- Gerontological Society of America, (www.geron.org)
- New York Academy of Sciences, (www.nyas.org)
- American Psychological Association, (www.apa.org)
- Society of Behavioral Medicine, (www.sbm.org)

HONORS AND AWARDS

- 2005-2006 National Institutes of Mental Health (NIMH) Pre-doctoral Research Fellowship in Medical Behavioral Science, Department of Behavioral Sciences, University of Kentucky. John F. Wilson, Ph.D., mentor.
- 2005 Research Award from the National Institute of Senior Centers for "Lexington Senior Center: Meeting the Challenges of the 21st Century".
- 2003-Present Sigma Phi Omega, National Honor Society in Gerontology Gamma Mu Chapter, University of Kentucky. Chapter President elect, 2005-2006.
- 2002-2003 RCTF Fellowship in Gerontology, University of Kentucky.

GRANTS AND RESEARCH SUPPORT

- 2005-2006 GCRC Clinical Research Feasibility Fund Award, (CReFF Award). University of Kentucky, \$20,000.
- 2005-2007 University of Kentucky CGRC, Ancillary Services Support (NIH Grant M01 RR02602) for dissertation research. \$43,311.65.

PUBLICATIONS

Peer-Reviewed Journals

- Erickson, M.A., Robison, J., **Ewen, H.H.**, and Krout, J.A. (In Press). Should I stay or should I go? Moving plans of older adults. *Journal of Housing for the Elderly*.
- Ewen, H.H.**, Watkins, J.F., and Bowles, S.L. (In Press). Gerontology doctoral training and the value of goals, program perceptions, and prior experience among students. *Educational Gerontology: An International Journal*.
- Gaugler, J.E. and **Ewen, H.H.** (2005). Building relationships in residential long-term care: Determinants of staff attitudes toward family members in residential long-term care. *Journal of Gerontological Nursing*, 31(9), 19-25.
- Gaugler, J. E., Anderson, K. A., & **Holmes, H. H.** (2005). Family-based intervention in residential long-term care. *Marriage & Family Review*, 37, 45-62. Simultaneously published in Caputo, R. K. (Ed.) *Challenges of Aging on U.S. Families*. Haworth Press.
- Gaugler, J. E. and **Holmes, H. H.** (2003). Families and the institutionalization experience: Adaptation and intervention. *The Clinical Psychologist*, 7 (1), 32-43.
- Krout, J., Moen, P., **Holmes, H.**, Oggins, J., and Bowen, N. (June, 2002). Reasons for relocation to a continuing care retirement community. *Journal of Applied Gerontology*, 21 (2), 236-256.
- Beissner, K., Collins, J., and **Holmes, H.** (2000). Extremity strength and range of motion as predictors of function in older adults. *Physical Therapy*, 80 (6), 556-563.
- Krout, J., Oggins, J. & **Holmes, H.** (2000). Patterns of service use in a continuing care retirement community. *The Gerontologist*. 40 (6). 698-705.

Other Publications

- Holmes, H.H.** and Rowles, G.D. (2005). Adult foster care. In R. Schultz (Ed.) *Encyclopedia of Aging, 4th Edition*. New York, NY: Springer Publishing.

- Holmes, H.**, Beissner, K., Welsh, K. and Krout, J. (2003). Physical health, housing, and disability. In Krout, J. & Wethington, E. (Eds.) *Residential Choices and Experiences of Older Adults: Pathways to Life Quality*. New York, NY: Springer Publishing.
- Holmes, H.**, Krout, J., and Wolle, S. (2003). Community based service utilization. In Krout, J. & Wethington, E. (Eds.) *Residential Choices and Experiences of Older Adults: Pathways to Life Quality*. New York, NY: Springer Publishing.
- Krout, J., Moen, P., **Holmes, H.** and Erickson, M.A. (2003). Residential relocation. In Krout, J. & Wethington, E. (Eds.) *Residential Choices and Experiences of Older Adults: Pathways to Life Quality*. New York, NY: Springer Publishing.
- Lawler, K.A., Kline, K.A., **Harriman, H.L.**, and Kelly, K.M. (1999). Stress and Illness. In Derlega, V.J., Winstead B.A., & Jones, W. (Eds.), *Personality: Contemporary Theory and Research* (2nd ed.) Chicago, IL: Nelson-Hall Publishers.

WORKING PAPERS AND RESEARCH REPORTS

- Ewen, H.H.**, Bottiggi, K., Anderson, K., Day, G., Hughes, T.B., Knapp, K., Lawrence, S., Leach, C.R., Traywick, L.S., Guttman, R., Teaster, P.B., and Smith, M.D. (2005). Recommendations for the White House Conference on Aging from the University of Kentucky Summer Series on Aging. Occasional Research Report: University of Kentucky. www.whcoa.gov/about/des_events_reports/PER_KY_07_27_05.pdf
- Anderson, K., Bowles, S., Centers, L., **Holmes, H.**, Hosier, A., Marken, D., Palmer, C., Towsley, G., and Traywick, L. (2003, May). Lexington Senior Citizens Center: Meeting the Challenges of the 21st Century. [<http://www.mc.uky.edu/gerontology/researchreports.htm>]. Occasional Research Report: University of Kentucky.
- Krout, J. A., **Holmes, H.**, and Wolle, S. (2000, November). Anticipated living arrangements of community-dwelling older adults. (Pathways Working Paper 00-11). Ithaca, NY: Pathways to Life Quality Study, Ithaca College and Cornell University.
- Beissner, K., Collins, J. E. and **Holmes, H.** (2000, March). Extremity strength and range of motion as predictors of function in older adults. (Pathways Working Paper 00-02). Ithaca, NY: Pathways to Life Quality Study, Ithaca College and Cornell University.

- Krout, J. A., Moen, P., Oggins, J., **Holmes, H.** and Bowen, N. (2000, March). Reasons for relocation to a continuing care retirement community. (Pathways Working Paper #00-04). Ithaca, NY: Pathways to Life Quality Study, Ithaca College and Cornell University.
- Krout, J. A., **Holmes, H.** and Oggins, J. (2000, March). Patterns of service use in a continuing care retirement community. (Pathways Working Paper #00-05). Ithaca, NY: Pathways to Life Quality Study, Ithaca College and Cornell University.

PRESENTATIONS

- Wangmo, T., Webb, A., **Ewen, H.**, Teaster, P., & Hatch, L. (2007). A Trifecta of Student Mentorship at the UK Graduate Center for Gerontology. Paper to be presented at the 33rd meeting of the Association for Gerontology in Higher Education, Portland, OR.
- Ewen, H.H.** (2006). Adaptation to Senior Housing Among Older Women: Physiological and Psychosocial Outcomes. Paper to be presented at the annual meeting of the Gerontological Society of America, Dallas, TX.
- Ewen, H.H.**, Nikzad, K.A., Bowles, S.L., & Carr, D.C. (2006). Gerontology Doctoral Education: Students' Perceptions of Educational and Research Experience. Paper to be presented at the annual meeting of the Gerontological Society of America, Dallas, TX.
- Webb, A., Wangmo, T., **Ewen, H.**, Teaster, P., & Hatch, L. (2006). Faculty-to-student mentorship at the UK Graduate Center for Gerontology. Poster presented at the 27th Annual Meeting of the Southern Gerontological Society, Lexington, KY.
- Leach, C., Schoenberg, N., & **Ewen, H.** (2006). Modeling the relationships between caregiver role overload and depression in cancer caregiving. Poster presented at the 27th Annual Meeting of the Southern Gerontological Society, Lexington, KY.
- Ewen, H.H.**, Nikzad, K.A., & Watkins, J. (2006). Gerontology doctoral students perceptions of interdisciplinary training. Paper presented at the 32nd Meeting of the Association for Gerontology in Higher Education, Indianapolis, IN.

- Ewen (Holmes), H.** (2005). Diversity in Theory, Concepts, and Methods: Development of Gerontology Doctoral Dissertations. Symposium (Chair). Symposium presented at the annual meeting of the Gerontological Society of America, Orlando, FL.
- Ewen (Holmes), H.** (2005). A bio-psychosocial model of stress in relocation among older women. Symposium paper presented at the annual meeting of the Gerontological Society of America, Orlando, FL.
- Ewen (Holmes), H. & Watkins, J.** (2005). The Progressive Experiences of Gerontology Doctoral Students: Perceptions of Courses, Opportunities, and Future Career Paths. Paper presented at the annual meeting of the Gerontological Society of America, Orlando, FL.
- Holmes, H., Krout, J.A., and Bowles, S.L.** (2004). Bereavement experience and adaptation among community-dwelling older adults. Poster presented at the annual meeting of the Gerontological Society of America, Washington, DC.
- Holmes, H., Bowles, S., and Traywick, L.S.** (2004). Relocation to Semi-Rural Senior Housing: Who Moves and How do they Fare? Symposium paper presented at the 25th Annual Southern Gerontological Society Conference, Atlanta, GA.
- Traywick, L., Schoenberg, N., Peters, J., and **Holmes, H.** (2004). Barriers to hospital arrival when experiencing a heart attack. Paper presented at the 25th Annual Southern Gerontological Society Conference, Atlanta, GA.
- Krout, J.A. and **Holmes, H.** (2003). Change in CCRC resident well-being over a four year period. Poster presented at the annual meeting of the Gerontological Society of America, San Diego, CA.
- Leach, C., Anderson, K., Gaugler, J. and **Holmes, H.** (2003). Psychosocial variations in the dementia caregiving career. Poster presented at the annual meeting of the Gerontological Society of America, San Diego, CA.
- Krout, J. and **Holmes, H.** (2003). Living environment differences in health, social integration and social support: A Longitudinal study. Paper presented at the annual meeting of the State Society on Aging of New York, Albany, NY.
- Holmes, H.** and Krout, J. (2002). Housing, health, and disability among upstate New York elders. Paper presented at the annual meeting of the Gerontological Society of America, Boston, MA.
- Krout, J., **Holmes, H.**, and Wolle, S. (2002). Patterns of service use by community and senior housing facility residents. Poster presented at the annual meeting of the Gerontological Society of America, Boston, MA.

- Krout, J. and **Holmes, H.** (2002). Quality of life differences among older movers and stayers. Research application presented at the second joint conference the National Council on Aging and the American Society on Aging, Denver, CO.
- Holmes, H.** (2001). Predictors and correlates of chronic disease in older women. Paper presented at the annual meeting of the Gerontological Society of America, Chicago, IL.
- Holmes, H.** and Krout, J. (2001). Health status and health behaviors among older residents of an upstate New York community. Symposium paper presented at the annual meeting of the Gerontological Society of America, Chicago, IL.
- Krout, J.A. and **Holmes, H.** (2001). Housing and health: How housing location impacts health and service use. Poster presented at the annual meeting of the Gerontological Society of America, Chicago, IL.
- Holmes, H.** (2001). Relationships between cardiovascular disease and coping strategies in post-menopausal women. Symposium paper presented at the National Council on Family Relations conference, Rochester, NY.
- Holmes, H.** and Wolle, S. (May, 2001). Anticipated living arrangements of older adults. Research results presented at the annual conference of the Empire State Association of Adult Homes and Assisted Living Facilities, Montreal, Canada.
- Krout, J. and **Holmes, H.** (March, 2001). Housing, Aging, and Health: Impact of Housing and Location on Chronic Disease. Research brief presented at the first annual American Society on Aging/National Council on Aging conference, New Orleans, LA.
- Holmes, H.** and Krout, J. (2000). Variations in chronic disease type across senior housing facilities. Paper presented at the annual meeting of the State Society on Aging of New York, Albany, NY.
- Holmes, H.** and Whitlow, C.M. (2000). Senior housing managers: Challenges, successes, and future concerns. Symposium paper presented at the annual meeting of the State Society on Aging of New York, Albany, NY.
- Holmes, H.** and Krout, J. (2000). Relationships between community based service use and residential facility type. Symposium paper presented at the annual meeting of the Gerontological Society of America, Washington, DC.

- Krout, J. and **Holmes, H.** (2000). The impact of relocation to a CCRC on community based service utilization. Symposium paper presented at the annual meeting of the Gerontological Society of America, Washington, DC.
- Holmes, H.** and Krout, J. (2000). Measures of adaptation to and satisfaction with seniors housing. Paper presented at Assisted Living Federation of America National Conference and Expo., Seattle, Washington.
- Krout, J. and **Holmes, H.** (2000). Resident satisfaction and adaptation to assisted living, retirement housing, and CCRCs. Presented in a plenary session at New York Association of Homes and Services for the Aging, Saratoga Springs, New York.
- Krout, J. and **Holmes, H.** (1999). Anticipated Living Arrangements of Community-Dwelling Older Adults. Symposium paper presented at the annual meeting of the Gerontological Society of America, San Francisco, CA.
- Knight, C., **Holmes, H.**, Oggins, J., & Benoit, M. (1999). Room to work: Person-environment transaction needs of the elderly. Poster presented at the annual meeting of the American Psychological Association, Washington, D.C.
- Harriman, H.L.** and Midkiff, E.E. (1996). Human-animal interaction: The effects of pheromones. Paper presented at the Mid-American Undergraduate Psychology Research Conference, May 1994, Evansville, IN. Poster presented at the Annual meeting of the Association for Chemoreception Sciences, April 1996. Tampa, FL.

UNIVERSITY SERVICE/ COMMITTEES

- | | |
|-----------|---|
| 2005-2006 | Association for Gerontology in Higher Education (AGHE; www.aghe.org), Student Representative, Student Committee. |
| 2005-2006 | College of Public Health Student Advisory Council to the Dean, Student Representative, Graduate Center for Gerontology. |
| 2005-2006 | Program Assessment Committee, Senior Student Representative. Graduate Center for Gerontology. |
| 2005-2006 | Mentoring Committee, Senior Student representative. Graduate Center for Gerontology |
| 2005-2006 | Sigma Phi Omega, Gamma Mu Chapter, President elect. |
| 2003-2004 | Faculty Search Committee, Student Elect Representative. Graduate Center for Gerontology |