ABSTRACT

LIU, GUANGYA. Growing Pains in Aging China: Parental Caregiving and Health Implications in Women. (Under the direction of Feinian Chen and Virginia Aldigé).

Using multiple waves of data from the China Health and Nutrition Survey (CHNS) in 1991, 1993, 1997, 2000, 2004, 2006, and 2009, I examine the patterns and health implications of parental caregiving in China. The findings show that approximately 8% of women between the ages of 18 and 52 provide care to their aging parents, parents-in-law, or both. On average, caregivers spend 11 hours per week on caregiving. I find that sociodemographic characteristics, socioeconomic resources, social roles, caregiving risks, and community characteristics are important predictors of transitions to caregiving and the time spent on caregiving. Results demonstrate that caregivers and non-caregivers with parents in need have worse self-reported health than non-caregivers without caregiving responsibilities. After initially low levels of health, caregivers—especially those who provide high-intensity care—exhibit levels of health that are comparable to non-caregivers. However, this pattern of adaptation is followed by a precipitous decline in health in later years. Overall, the findings support role strain theory and provide some evidence for the role adaptation and wear-and-tear hypotheses in a life course framework.

Growing Pains in Aging China: Parental Caregiving and Health Implications in Women

by
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DEDICATION

For my parents Fazeng Liu and Qingshu Yu who made countless sacrifices for the family and took care of my grandmother for almost three decades. Their strength and love are the inspiration for this dissertation.

此博士论文献给我的父母刘法曾和于清淑,他们为家庭做出了许多的牺牲,照顾了我的奶奶将近三十年.他们勇气和爱激发了我对这个课题进行研究的灵感.

BIOGRAPHY

Guangya Liu was born on November 5, 1980 in Henan, China. She earned a Bachelor of Arts degree in Sociology from Nankai University in 2003 and Master of Arts degree in Sociology from Georgia State University under the direction of Frank Whittington and Heying Jenny Zhan. While completing her Doctor of Philosophy degree, Guangya joined Duke Law School. She currently resides in Cary, North Carolina, with her husband and two children.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Over the last several decades, the world witnessed China undergo one of the most dramatic social transformations in modern times, with impressive economic growth, reductions in poverty, and vast improvements to its public health infrastructure. Unparalleled to its success in economic terms, however, the development of China's old-age support is comparatively slow and problematic. For a society spanning more than 2,000 years, the achievement of "old age" is a relatively new phenomenon for this nation and the breadth of its challenges is only now being understood.

At the beginning of the last century, life expectancy worldwide was 45 years for men and 46 years for women [United Nations (U.N.) 2009]. Today, the life expectancy at birth in China is 72 years for men and 76 years for women (U.N. 2009). The commensurate demographic changes to China's age structure are equally astonishing. As shown in Figure 1.1, the proportion of the population aged 65 and older was less than 5% in most regions in the 1950s and went as high as 7% in most regions by 2010. According to China's 2010 population census, the proportion aged 65 and older increased from 4.4% (approximately 26.2 million) in 1953 to 8.9% (approximately 118.7 million) in 2010 (Peng 2011). Increasing life expectancy among older adults has introduced new burdens on the family and adult children are now shouldering greater responsibilities in caring for their aging parents with chronic and debilitating illnesses.

In the United States, the emotional and financial burden of caregiving among adult children is greatly alleviated by numerous government programs such as Medicare, Medicaid, and Social Security that protect many elderly Americans from the negative risks at old ages. In contrast, in a family-centered society, guided by strong and persistent filial norms and expectations, Chinese adult children shoulder the majority of caregiving responsibilities largely due to a lack of national social security system. China's unique societal structure and cultural norms make it an ideal setting to examine how families mobilize resources to fulfill their caregiving responsibilities.

1.2 RESEARCH OBJECTIVES

This dissertation provides a comprehensive picture of parental caregiving among young-adult and middle-aged daughters and daughters-in-law in China. In doing so, I address three major objectives. First, I investigate the factors that increase or decrease a woman's likelihood of becoming a caregiver in China. This analysis provides the first longitudinal examination of the characteristics of women in China who are most likely to be caregivers during a significant period their life course. Second, I examine the factors that influence individuals' provision of care. This analysis is the first to draw upon large-scale data from China and advanced statistical methods to identify the predictors of time spent on caregiving for parents and parents-in-law. Third, I investigate the impact of caregiving status, timing, and intensity on the health of young-adult and middle-aged women in China. This analysis provides new and robust evidence that addresses the currently inconclusive literature on whether caregiving improves or worsens health for those who provide care.

The current body of research contributes significantly to the literature by providing a comprehensive analysis of caregiving patterns and their health implications in a non-Western society. The changing social, demographic, political, and cultural context in China provides an ideal setting to examine the dynamics of parental care involvement and health in a traditionally family-care centered society. Using rich longitudinal data from China, I empirically test how individual characteristics, family contexts, and societal constraints influence women's caregiving involvement and health over an important and extensive period of the life course.

1.3 ORGANIZATION OF THE DISSERTATION

The organization of the dissertation is as follows. Chapter 1 provides an overview of the importance of studying caregiving in China and outlines subsequent chapters. Chapter 2 examines the predictors of caregiving transitions among young and middle-aged women in China. Chapter 3 investigates the determinants of time spent on caring for parents and parents-in-law. Chapter 4 studies the effects of caregiving status, timing, and intensity on health trajectories over time. Chapter 5 concludes by discussing the research and policy implications of the findings.

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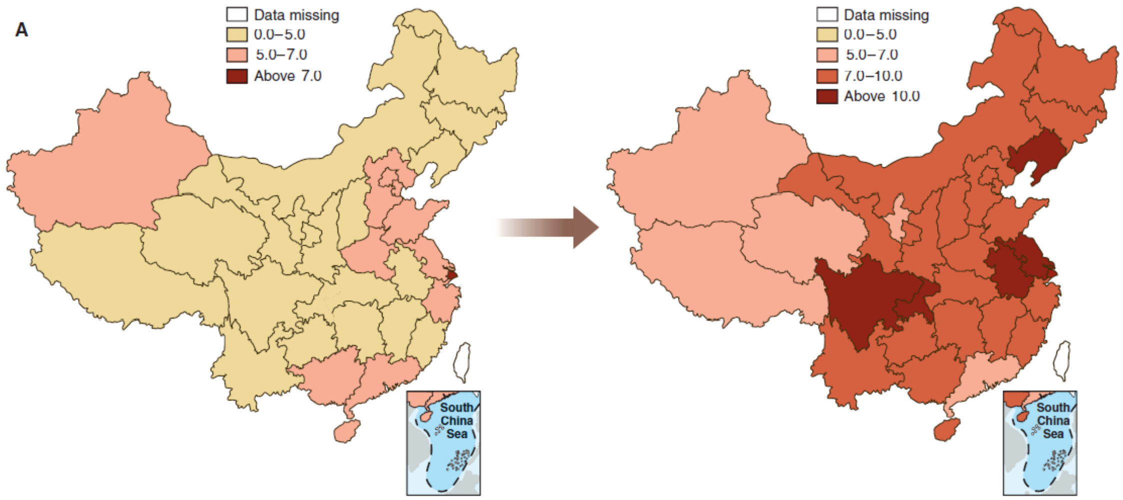

Figure 1.1. Proportion of Population Aged 65 and Older in China, 1950-2010

Source: Peng, Xizhe. 2011. "China's Demographic History and Future Challenges." *Science* 581-588.

CHAPTER 2

PREDICTORS OF CAREGIVING AMONG YOUNG-ADULT AND MIDDLE-AGED WOMEN IN CHINA

Can China meet the challenge of caring for the largest population of senior citizens in the world? The answer largely depends on the collective efforts of individuals, families, and the government. Unlike in the United States, where intergenerational exchange is dominated by downward transfers from aging parents to adult children (Berry 2001; 2008); upward transfers from adult children to their elderly parents are more prevalent and normative in China (Zhou 2010). Due to the lack of an established social security system and limited institutional resources for elderly care, especially in rural areas (Shang 2001; Wang, Gu, and Dupre 2008), the responsibility of caring for aging parents has historically fallen on individuals and families.

This chapter provides a comprehensive picture of parental caregiving among young-adult and middle-aged daughters and daughters-in-law in China. In doing so, I address two major objectives. First, I document the percent of women who were ever-married and exposed to caregiving roles during early and middle adulthood over 18 years in China. In the United States, one out of five adults between the ages of 35 and 64 provides care to an ill or disabled family member either inside or outside of their home (Marks 1996). To date, however, there is no reliable documentation of the prevalence of caregiving by family members in China. Although researchers have examined financial transfers and co-residence between parents and adult children as a form of old-age support in China (e.g., Logan and

Bian 1999; Zimmer and Kwong 2003; Chen 2005), little is known about the extent to which adult children provide hands-on care to their family in this society. I address this limitation by providing the first distributional evidence of caregiving prevalence among young-adult and middle-aged women in China.

Second, I investigate the factors that increase or decrease a woman's likelihood of becoming a caregiver in China. Until now, almost all of our knowledge on parental caregiving has been based on evidence from Western societies. Furthermore, previous studies have often relied on convenience samples and have been limited to specific geographic regions (e.g., Zhan 2000). Using multiple waves of CHNS data and transition-rate models, this research provides the first large-scale longitudinal analysis of the characteristics of women in China at greatest risk of becoming a caregiver. The current analysis identifies time-varying and time-invariant factors for sociodemographic characteristics, caregiving resources, social roles, caregiving risks, and community characteristics that are hypothesized to play the strongest role in the process of transitioning to caregiver status.

Parental care is defined as the instrumental health care that adults provide to their elderly parents or parents-in-law. My research focuses exclusively on young-adult and middle-aged women because (i) existing research shows that women are significantly more vulnerable to the negative effects of caregiving than men, (ii) daughters and daughters-in-law provide the majority of care for the aging population in China, as defined by strong traditional norms, and (iii) data on parental caregiving is limited in general, and specifically to women aged 18 to 52 in the China Health and Nutrition Survey (CHNS).

2.1 BACKGROUND

The decision to become a caregiver is complex and balances calculations of resources, the responsibilities expected of that role, and the changes (sometimes substantial) to the individual's routine and normal way of life. In this section, I review the unique and various life-contexts that promote and constrain Chinese women's choice of becoming caregivers—defined by cultural norms, structural forces, and demographic composition.

Cultural Norms

The Role of Family Care

China is known as a family-care centered society. Traditionally, most Chinese elders received care from their family members, primarily from their adult children. *Xiao*, or filial piety (a major component of Confucius thought), emphasizes obedience, respect, emotional support, and physical care to the elderly and guides family relationships. As such, the role of family care has remained unshaken as the predominant source of care for older adults throughout Chinese history. In 1996, a law was implemented to ensure the economic and social rights of the aged (中华人民共和国老年人权益保障法) and emphasized the role of adult children in providing physical care and financial assistance to the elderly. Table 2.1

describes several of the key articles that relate to the caregiving responsibilities of family as dictated by the current law.

Unlike in western nations, institutional care has a relatively short history in China and its use is often stigmatized. On one hand, institutionalized elders may feel abandoned because their adult children are regarded as their traditional caregivers in China. On the other hand, adult children also face social pressure for not fulfilling their filial obligations and placing their elder parents in institutions. Consequently, the combined sense of shame and fear of "loosing face" limits, and largely prevents, many elders from entering institutions, regardless of health status. Studies show that most disabled Chinese elders receive care from their family members and less than 5% receive care in institutions (Liang and Gu 1989; Zhan, Liu, Guan, and Bai 2006). By and large, family care remains the backbone of caregiving in China.

The Role of Daughters and Daughters-in-law

For centuries, China has been a patriarchal, patrilocal, and patrilineal society (Thornton and Lin 1994) and the influence of intergenerational relations and family values on individuals has been strong (Lou 2007; Purnell and Paulanka 2008). Historically, Chinese parents have preferred to have their sons continue the family lineage by carrying forward their surnames. Sons also were preferred because they were culturally obligated to provide support for their aging parents. Simply put, many Chinese subscribed to the ancient proverb: "To raise a son is to protect yourself at old ages (养儿防老)." (Lan 2002) Moreover, the common sentiment was that after women got married, they were considered "spilled water" (

泼出去的水) who took on their husbands' home-rearing responsibilities and became free of filial obligations for caring for their own parents. Even nowadays, sons and daughters-in-law are equally, if not more, responsible than daughters for caring for elderly family members in China (Wang et al. 2010); and aging parents are more likely to live with their sons and daughters-in-law in later life (Chen 2005). Accordingly, the culturally sensitive role of daughters-in-law has fueled great interest in aging research (e.g., Silverstein and Giarrusso 2010).

Similar to other cultures, gendered patterns of household division of labor still prevail in China: a man provides financial support for his parents as the major breadwinner and his wife (i.e., daughter-in-law) is responsible for the daily caregiving tasks for older adults. According to Chinese traditional norms, daughters are not expected to play a central role in providing support to their parents. However, young, educated, professional women seem to be redefining the traditional sources of caregiving (i.e., daughters-in-law as dominant caregivers for parents-in-law): it is increasingly common for daughters to share caregiving responsibilities with their male siblings. Recent research suggests that patriarchal, patrilocal, and patrilineal norms in China may be changing as married daughters—especially those living with parents—provide more financial assistance to their aging parents than do sons in urban areas (Xie and Zhu 2006). Similarly, adult daughters are shown to provide the same levels of support as adult sons (Whyte and Xu 2003). In fact, researchers have noted that oldest-old parents who live with their daughter(s) often report improved emotional health in China (Chen and Short 2008).

Since the implementation of the one-child policy in the late 1970s, norms guiding caregiving expectations and behaviors have evolved to reflect the needs of Chinese families with only daughters from whom parents must depend on care at older ages. In response, young Chinese women have largely embraced these new filial responsibilities for their parents at older ages. For example, a recent study on children of the one-child policy shows that girls feel greater obligations to provide parental care than boys (Zhan 2004).

Finally, with the weakening of filial piety in modern China, undue pressures and strain have arisen from the close and extensive interactions between older (traditional) generations and younger (contemporary) generations (Whyte 2004; Cheung and Kwan 2009). As a result, Chinese women are facing greater challenges actively participating in the labor force while providing the necessary care to support the needs of their aging family member.

Structural Forces

Rural-Urban Divide

There are large discrepancies in economic development, poverty, insurance coverage, and health care resources throughout regions that define urban and rural China (Kanbur and Zhang 2005; Ravallion and Chen 2007; Benjamin et al. 2008). In many ways, "today's rural–urban gap reflects the institutional legacies of socialism (Park 2008: p41)." Beginning in the 1950s, every individual was classified as either an urban or rural resident under the household registration system (*hukou*) with the principal objective of restricting mobility from rural to urban areas. Urban areas were generally given developmental priority—by both central and local authorities—which reflected broad strategic efforts by the Chinese government to industrialize the nation. As a result, urban residents have long-enjoyed advantages in virtually all aspects of life, including higher education, employment opportunities, health care, pensions, and housing benefits relative to their rural counterparts.

Urban-rural disparities are particularly pronounced and becoming increasingly problematic with regard to old-age security benefits. The coverage of public old-age support is quite limited and only one-fifth of the elderly population in China is covered by the pension system, and most are urban residents (Salditt, Whiteford and Adema 2008). Under the planned economy, the state traditionally financed pensions through a Pay-As-You-Go system and corporations (or work units) offered cradle-to-grave services for their employees almost exclusively in urban areas (Chen and Liu 2009). In contrast, the majority of the rural elderly population is not covered under the current pension system and thus vulnerable to financial and commensurate health risks at later ages. Without a pension at older ages, rural elders are often forced to live off their own minimal savings or limited income from agricultural activities. Otherwise, these elders are dependent on their adult children who may or may not be in a position to provide financial assistance.

Not until recently have demographers and medical sociologists begun to explicitly study urban-rural differences in health and longevity in China (e.g., Zeng and George 2010; Xu and Gu 2001). Research now shows that rural older-adults have worse physical health, psychological well-being, and overall lower life expectancy than urban older-adults (Zimmer, Kaneda, and Spess 2007; Zimmer, Wen, and Kaneda 2010). Consequently, many rural elders have greater healthcare needs than their urban counterparts—a structural disadvantage for rural women who bear a greater burden of care relative to urban women.

Regional Disparities

China's provinces and regions are moving forward, but their rates of development vary enormously. Because of China's large geography and population size, the government favored economic and social policies that targeted certain provinces and regions before implementing such policies nationwide (Bell, Khor, and Kochhar 1993). Under the leadership of Xiaoping Deng, Special Economic Zones (SEZs) were set up and given advantages in taxes, trading, importing, exporting, and investments as key components of economic reform and an open-door policy. Most of the SEZs are located in the Coastal provinces of China, including Guangdong, Fujian, Hainan, Shandong, Jiangsu, and Zhejiang; and as a result, China witnessed rapid economic growth in these coastal areas with burgeoning regional disparities between coastal and interior China (Kanbur and Zhang 1999).

Adjacent to Russia and North Korea, the Northeast is another distinct region in China, comprised of three provinces: Heilongjiang, Jilin, and Liaoning. The Northeast is recognized as one of the first regions to industrialize in China. Since the establishment of China, the Northeast has long been an urbanized region with an economy that is heavily industry-based with manufacturing in iron, steel, coal, and petroleum products. However, the Northeast and its state-owned enterprises (SOEs) struggled in aligning its development with coastal areas during the transition from a planned to market economy in the 1990s (Dong 2005). By 2003, the government announced its plans to "revitalize the Northeast" in effort to boost its economic growth and it now receives assistance to initiate infrastructure projects and to establish a social security fund (Dong 2005). Aside from its distinct economic features, the Northeaster is known for people who are forthcoming, courageous, innovative, non-obedient, and enduring—characteristics that may well be indicative of caregiving tendencies (Han 2005).

As the byproducts of divergent levels of development, regions across China also differ tremendously in rates of fertility, life expectancy, old-age dependency, and per-capita spending on old-age security (Bell, Khor, and Kochhar 1993). As shown in Table 2.2, the Coastal region has the highest (per capita) GDP and old-age security spending, followed by Northeast, Inland, and Mountain areas with incrementally lower GDP and security spending. Northeast and Coastal areas have lower total fertility rates and higher levels of urbanization than Inland and Mountain regions. Residents from Northeast and Coastal regions also enjoy longer life expectancy than those from Inland and Mountain regions; and it is worth noting that life expectancy in Coastal areas is almost 6 years longer than in Mountains areas such as Guizhou (75.9 vs. 69.7 years, respectively). The Northeast has the lowest ratio of old-age dependence, implying the lowest burden of care for this population.

Population Composition

Demographic Changes

China is currently confronting major challenges in its traditional system of care for a rapidly expanding elder population. The sources of these challenges are threefold. First, the proportion of adults aged 60 and older in the population will increase from approximately 11 percent in 2005 to 30 percent in 2050 and the proportion of oldest-old adults (i.e., ages 80 and older) will increase from 1 percent to 7 percent during the same period (United Nations 2006). Second, the effectiveness of the one-child policy in conjunction with economic development has led to dramatic declines in fertility. As a result, younger cohorts will face tremendous and increasing difficulty providing care for the elderly under a 4-2-1 family structure (four grandparents, two parents, and one child) compared to older cohorts. Third, China has one of the highest rates of female labor force participation in the world. According to the World Bank (2005), approximately 465.6 million Chinese women participated in the labor market and comprised approximately 43.8 percent of the entire labor force in 2005. Indeed, about 80 percent of women in China currently work outside of their homes (UN 2009). Consequently, a growing number of women may struggle balancing work and family obligations as they encounter increasing demands of providing care for their aging parents.

Urban-Rural Migration

Another factor that has important implications for elder care is the massive migration of young adults who leave their hometown and older parents behind (Knodel and Saengtienchai 2005; Kuhn 2005). There are an estimated 144.4 million persons (so-called "floating population") who migrate from rural to urban areas to look for employment opportunities (National Bureau of Statistics in China 2002). Some studies have raised concerns about the potentially negative impact of migration on old-age support because of the absence of adult children needed to fill caregiving roles (Giles, Wang, and Zhao 2010).

In contrast, other studies highlight the overall positive impact of migration on old-age support. For example, a new study shows significant financial assistance and emotional connections among rural elders and adult children who migrated (Luo and Zhan 2012). However, other studies acknowledge both decreased instrumental support and increased monetary support from adult children who migrated from home (Du et al. 2004; Keasberry 2001; Kuhn 1999; Luo and Zhan 2012).

2.2 THEORETICAL FRAMEWORK AND HYPOTHESES

Becoming a caregiver involves significant changes in family roles, obligations, and time allocation. Several theories have been proposed to address various factors that motivate individuals to become caregivers. According to social exchange theory, adult children are rational actors that are ultimately motivated by their own interests. Their tendency to provide care and support is related to their own needs – such as an inheritance or childcare support from their parents. In contrast, the altruist perspective suggests that adult children provide care in the best interests of their aging parents. Therefore, adult children are inclined to help parents who are less well-off and in greatest need of care; rather than provide care to parents who may offer the most financial assistance in return (McGarry and Schoeni 1995). Although these countervailing arguments may help us understand some of the basic motivations for providing care, they largely ignore the contextual and structural factors that shape individual patterns of caregiving (Szinovacz and Davey 2007).

In recent years, life course theory has gained increasing attention among caregiving scholars because of its emphasis on the temporal dynamics of family processes and the interrelationships among individuals, families, and larger socio-structural factors (see Elder 1974, 1975, 2003). Life course research demonstrates the importance of the timing, sequencing, transitions, and durations of individuals' social roles and statuses in the domains of education, family, work, and residence (Elder 1992). According to this perspective, an individual's life is comprised of various normative life transitions, including going to school, getting married, being employed, and retiring. These life transitions define a person's distinct experiences, opportunities, and unique biography that collectively represent a life cycle that unfolds from childhood through adulthood.

A life course approach to caregiving recognizes the systematic and patterned events experienced by individuals and families as they age (White and Klein 2002). Providing care to aging family members is considered an important life course transition that many individuals, particularly women, experience during adulthood (e.g., Moen, Robison, and Dempstermcclain 1995; Moen, Robison, and Fields 1994). Despite the abundance of applications of life course theory in family research, many studies fail to consider caregiving as a role transition, or even a major status in women's classifications of role sets (for exceptions, see Moen et al. 1994; Doress-Worters 1992; Doress-Worters 1994). I argue that the transition to caregiving marks an important turning point in one's life course that has important implications for the individual, the care recipient, and the entire family.

Previous studies have identified four theoretical concepts from a life course perspective that are particularly informative for understanding patterns of providing parental care. These include (i) the contextual embeddedness of life transitions, (ii) the interdependence of life spheres, (iii) the notion of linked lives, and (iv) life course development (Moen 1996; Szinovacz 2003; Szinovacz and Davey 2007). Guided by these life course concepts, I examine three important research questions. First, what factors predict transitions to caregiving? I specifically examine the influence of sociodemographic characteristics, caregiving resources, competing social roles, and caregiving risks in determining individuals' likelihood of becoming a caregiver. Second, does community context (i.e., population density, health infrastructure, and economic activity) influence transitions to caregiving? Finally, do predictors of caregiving differ for those who provide care for parents and for those who provide care for parents-in-law? The next section discusses how these concepts are related to hypothesized predictors of caregiving.

Contextual Embeddedness of Life Transitions

Contextual factors largely define the structural position of individuals in society; contextual factors also structure how support and resources are exchanged across generations. The contextual embeddedness of life transitions refers to the general circumstances under which life transitions occur. These circumstances can be considered resources as well as constraints in influencing women's likelihood of becoming caregivers. In other words, aging parents and adult children are both situated in a larger social structure and possess certain economic and social resources that either promote or suppress motivations and ability to provide care.

As indicated earlier, there are large regional, urban-rural, and other contextual differences throughout China. Therefore, I hypothesize that there are significant regional and urban-rural differences in women's likelihood of becoming caregivers. I also hypothesize that community context (i.e., population density, health infrastructure, and economic activity) will influence rates of caregiving among women.

The Interdependence of Life Spheres

The interdependence of life spheres describes the close relationship among various life spheres (e.g., work, family, and leisure). Individuals often occupy multiple roles at the same time and juggle responsibilities associated with these different social positions. For example, women typically occupy the roles of mothers, sisters, employees, wives, and caregivers at some point during their life course. Not surprisingly, occupying one role is likely to diminish the likelihood of taking on another role because each role entails different demanding obligations, duties, and responsibilities. Pearlin (1989:p.245) emphasized role strain as an important type of stressor and urged sociologists to "focus their attention on problems that arise within the boundaries of major social roles and role sets".

Marital Role and Child Rearing

Research shows that the roles of marriage and child-rearing can affect women's participation in other life spheres. On one hand, married status will increase women's exposure to the caregiving role because they are in a union with ties to more older-adults who may require care. On the other hand, having children often leads to a temporary withdrawal from the labor force and/or diminished (or delay) obligation to provide for older family members (Johnson and Favreault 2001, Pavalko and Artis 1997).

The Sandwich Generation describes adults who support their children while also caring for their aging parents (Miller 1981; Pierret 2006). This term most often refers to women aged 35 to 65 who are under tremendous physical and emotional strain from being wedged between dual caregiving responsibilities. Chinese women in particular have been the center of opposing forces for decades. From one perspective, a high percentage of women now work outside of the home because work has been advocated as means to gender equality by the Chinese government. From another perspective, women are expected to be in charge of child-care responsibilities (Short, Chen, Entwisle, and Zhai 2002). Although women now have less child-rearing responsibilities as a consequence of declining fertility rate, they are pressured to invest more time and effort into their only children (Jiao, Li, and Jing 1996). For women with more children, research shows that their sense of filial piety is lower and provides some evidence of role conflict for women with greater child-rearing responsibilities in China (Cheung and Kwan 2009). Taken together, the unique context of childcare in China makes it an interesting setting to study how Chinese women handle their dual caregiving responsibilities. To date, however, studies have not examined the effect of having children on women's likelihood of becoming a caregiver.

Employment

The literature is mixed with regard to how employment affects caregiving. Some research shows that employment reduces women's involvement in the care of elders. For instance, a study of middle-aged daughters of aging women shows that paid work reduced the amount of time spent on caregiving by half (Lang and Brody 1983). However, other research suggests that working women do not provide less care than non-working women (Brody and Schoonover 1986). What appears to differ between working and non-working women is the *type* of care that they provide—employed women are less likely to provide personal care and cooking and more likely to use paid services (Brody and Schoonover 1986). In fact, many women work part-time jobs (often with lower pay) that provide flexibility in their schedules to allow time to care for their parents (Johnson and Lo Sasso 2000).

China is known for its high female labor force participation and three main factors account for this phenomenon. First, co-residence with grandparents or having grandparents living nearby allows women with young children to work (Du 2008). Second, the wide availability of childcare centers has a positive impact on women's employment (Kilburn and Datar 2002). Lastly, low rates of fertility greatly shorten women's child-bearing and child-rearing years (Zhao 2006). Despite these well-known associations, the effect of work roles on women's caregiving transition is less understood.

Based on the principle of the interdependence of life spheres, I hypothesize that women's social roles influence their likelihood of becoming a caregiver. Marital status is a social role that is predicted to increase women's likelihood of becoming a caregiving due to greater exposure to aging parents and in-laws. In contrast, child-rearing and employment are social roles that decrease women's odds of becoming a caregiver due to greater competing demands.

Linked Lives

The concept of linked lives underscores the connection of individuals with others in their family and their wider social networks. Family researchers argue that "the allocation of support responsibilities among family members derives from negotiations within the family system as a whole and is responsive to each family member's abilities and obligations at any point in time" (Szinovacz and Davey 2007:p282; also see Davey and Norris 1998). In the framework of the current research, adult children respond to the needs of their aging family members and significant others in their lives. When parents become physically disabled or lack support, adult children are likely to be responsive and provide assistance. Guided by this life course concept, I hypothesize that the linked lives of aging parents and their children shape processes of providing care by increasing connectedness and the likelihood of transitioning to a caregiving relationship. Operationally, co-residence may influence children's propensity to provide care in two important ways. First, co-residence increases face-to-face interactions, cultivates bonds, and strengthens intergenerational solidarity between aging parents and adult children (Chen and Silverstein 2000; Pei and Pillai 1999). Second, co-residence also may reflect the spectrum of how the poor health status of aging parents who need assistance ultimately transitions to dependence on caregiving. Moreover, this process transitions to caregiving may be accelerated in aging parents who are widowed and thus lack the support of their spouses.

Life Course Development

The concept of life course development suggests that individuals' exposure to caregiving responsibilities change over time in response to their resources (Moen 1996; Szinovacz and Davey 2007). To understand the dynamic process of caregiving, it is important to consider the role of caregiving resources (i.e., socioeconomic status) that reflect the current and changing life circumstances of adult children. Guided by the concept of life course development, I hypothesize that adult children's resources shape their chance of becoming caregivers. Caregiving resources may operate in two different ways. First, individuals with greater resources may be alleviated from caregiving responsibilities because they possess an abundance of resources to provide alternative care relative to those with fewer resources. For example, those with high SES can use paid services (e.g., in-home care) or relocate their parents to nursing facilities to avoid the time-consuming and physically demanding responsibilities of caregiving.

Second, individuals with greater resources may have the means and capacity to make arrangements (via work, etc.) that may be more compatible with providing caregiving activities. In a society like China, where filial norms are strong and social pressures are great, adult children with high SES may choose to care for their parents despite having the financial capacity to forego this obligation. For example, a study of 110 parental caregivers in China showed that those with higher incomes spent less time caregiving than those with lower incomes (Zhan 2000). Interestingly, the authors also found that the relationship between income and caregiving tasks was no longer significant when cultural factors, such as sense of social pressure, were considered. However, the likelihood of caregiving may also emerge from a lack of resources. That is, those with low SES often have lower-paying jobs, part-time employment, and fewer career-advancement opportunities which may indirectly provide the flexibility necessary to put them at greater risk of caregiving than those with high SES (Johnson and Lo Sasso 2000). The current study addresses how adult children's resources may be influencing their likelihood of becoming a caregiver.

Hypotheses

Based on my review of the literature and established theoretical concepts from life course perspectives, I summarize my general hypotheses below:

H1: From a contextual and compositional standpoint, the socio-demographic characteristics of adult children (i.e., age, geographic location, and urban-rural residence) will differ significantly for women who transition to caregiving and those who do not.

H2: Transitions to caregiving will be significantly associated with levels of socioeconomic resources (i.e., education and family income) among adult children as suggested by a life course development perspective.

H3: According to the interdependence of life spheres, women's social roles (i.e., marital status, work, and child-rearing) will significantly influence their likelihood of becoming a caregiver.

H4: Caregiving risks that emerge from linked lives (i.e., co-residence and widowed parents/in-laws) will be significantly associated with adult children's transitions to caregiving.

H5: The contextual embeddedness of life transitions suggests that in addition to regional and urban-rural differences, the community context (i.e., population density, health infrastructure, and economic activity) of adult children will significantly influence rates of caregiving among women.

2.3 DATA

I use longitudinal data from the China Health and Nutrition Survey (CHNS), an ongoing project conducted by the Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute of Nutrition and Food Safety at the Chinese Center for Disease Control and Prevention. I use panel data from surveys administered in 1991, 1993, 1997, 2000, 2004, 2006, and 2009. The CHNS was conducted in nine provinces with various levels of economic development, health, and resources, including Guangxi, Guizhou, Heilongjiang Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong. A multistage, random cluster sampling strategy was used and income was used to stratify the counties within these provinces.

The analytic sample used for analyses includes a subsample of women aged 18 and 52 in the Ever Married Women Survey (EMWS) of the CHNS. I acknowledge that the sample is limited to young-adult and middle-aged women and precludes generalization of the findings to women of all ages and those who never married. Nevertheless, this study captures a substantial portion of the life course for adult women in a period that is substantively rich in the competing demands (and consequences) of caregiving with other social roles. An additional shortcoming is that the EMWS does not include potentially informative variables for the care provided by siblings, spouses, or other relatives, relationships with parents/in-laws, and migration status of family members.

Despite these limitations, the EMWS has several major strengths that make it ideally suited for this study. First, the longitudinal design of the EMWS allows me to observe respondents at multiple time-points to determine temporal order and establish causal associations. In addition, the lengthy period of prospective data (nearly two decades) captures significant individual and societal changes in contemporary China and enables me to assess their time-varying role as determinants of caregiving. Second, the EMWS provides uniquely detailed information on caregiving. Most notably, respondents were asked to provide information on whether or not they provide care (and how much) for each parent and parent-in-law. Finally, in addition to the detailed data on women and their caregiving experiences, the EMWS provides comprehensive information on family context (e.g., co-residence) and community characteristics.

My working sample consists of 2,669 women interviewed in 1991, 2310 in 1993, 2,369 in 1997, 2,713 in 2000, 2793 in 2004, 2,584 in 2006, and 1,196 in 2009. There were 1,439 records dropped due to missing values on any variables included in the models (less than 8%). Thus, the complete analytic sample consists of a panel of 5,828 women who contribute 16,634 person-years of observation (i.e., at risk of transitioning to caregiving).

2.4 MEASURES

Dependent Variables

All respondents were asked: "During the past week, did you help her with her daily life and shopping?" Similar questions were asked about respondents' care for their fathers, mothers-in-law, and fathers-in-law, respectively. My key independent variable is the transition to caregiving across waves (see Section 2.5 for more detail). Using seven waves of EMWS follow-up, I categorize women as having a transition at the earliest observation that they report becoming a caregiver for any of their parents or parents-in-law. I recognize that the timing of transitions lack precision. However, I follow established research that conceptualizes caregiving as a discrete life event (see Choi and Marks 2006; Moen 1996; Moen, Robison, and Dempstermcclain 1995; Moen, Robison, and Fields 1994) rather than a cross-sectional social status. Moreover, I consider using this measure as an informative strategy to further understand the factors associated with becoming a caregiver (i.e., leading up to caregiving) rather than simply understanding the factors contemporaneously associated with caregiving status. Observed rates of caregiving transitions are presented in the next section.

Independent Variables

I include five groups of independent variables to examine the individual-level and contextual-level factors described above. These include sociodemographic characteristics, caregiving resources, social roles, caregiving risks, and community characteristics. The coding and measurement strategies described below were guided by existing research and conventional assignments used in the literature; however; extensive (re)coding and sensitivity analyses were used to determine the best fitting and most parsimonious measures for the current study and sample population.

All multivariate models include measures for sociodemographic characteristics. The age of women (in years) is used to account for differential "exposure" to caregiving for their elderly parents. Urban-rural residence (urban=1) is included in the analyses to capture the well-known and pronounced socio-cultural differences and living arrangements by region. I also include measures for geographic region to account for differences in economic development across provinces. The geographic regions are categorized as follows: Northeast, Inland, Mountain, and Coastal (reference group) regions. Liaoning and Heilongjiang are grouped into the Northeast region; Jiangsu and Shandong are categorized in Coastal areas; Henan, Hubei, and Hunan are categorized in the Inland region; and Guangxi and Guizhou are categorized in the Mountain region.

The second set of independent variables identifies women's resources as indicated by adequate levels of socioeconomic status. Educational attainment is categorized according to women with high school or above levels of education (coded 1) and those with a primary level of education or less. Household per capita income is coded 1 if individuals are not in the lowest quintile of the income distribution.

The third group of independent variables captures the major social roles that women occupy during their adult lives that may influence their likelihood of becoming caregivers.

Social roles are measured by marital status (coded 1 if currently married), employment status (coded 1 if currently working and 0 if not currently working or retired), and number of children (continuous) with differentiation between children living inside and outside of the household. The fourth category of independent variables takes into account the effects of caregiving risks. Caregiving risks are measured using two dichotomous measures for co-residence with parents/in-laws (yes=1) and having widowed parents/in-laws (yes=1).

The final group of variables that I investigate includes three contextual factors that measure community characteristics—including population density, health infrastructure, and economic activity. Communities in the CHNS refer to the areas within the cities, suburbs, towns, or villages of China and legally identified by the National Bureau of Statistics of China (see Jones-Smith and Popkin 2010). Information on community characteristics was obtained from knowledgeable respondents, typically community leaders. The definitions for each of these variables are as follows: Population density is the total population of the community divided by the size of the community area, obtained from official records (e.g., Chinese Statistical Year Book). Health infrastructure is measured as the number and type of health facilities in or around the community (~12 km radius) and the number of pharmacies in the community. Economic activity is measured as the typical daily wage for ordinary male workers (reported by community officials) and the percent of the population engaged in non-agricultural work (Jones-Smith and Popkin, 2010). Analysis of these variables will be among only a handful of studies that have examined community characteristics and urbanicity as a continuum (Jones-Smith and Popkin 2010; McDade and Adair 2001; Dahly and Adair 2007; Van de Poel, O'Donnell and Van Doorslaer 2007).

2.5 ANALYTICAL STRATEGY

The multivariate analyses use discrete-time hazard methods to model transitions to caregiving over the span of the 18-year study period. Discrete-time methods are chosen over continuous-time methods, such as Cox proportional hazard models and fully parametric models (e.g., Weibull), for several reasons. First, the EMWS data, and specifically the timing of transitions to caregiving, are known only at discrete time points (i.e., year of reported caregiving). Second, discrete-time methods are computationally effective for describing population-level rates of caregiving and for testing how these rates relate to individual-level factors—e.g., employment and marital status. Third, the use of time-varying variables is relatively easy to incorporate in the models. Finally, this approach is flexible for specifying the baseline transition rate and is less sensitive to assumptions of proportionality and time dependence (Allison 1984). Preliminary analyses showed that the results using discrete-time methods are consistent with those using Cox proportional hazard models.

Despite the strength of these analyses, three issues should be noted. First, as previously stated, I recognize that the timing of caregiving transitions cannot be determined with age-specific accuracy. However, I maintain that the current analytic strategy will provide new insights about the factors leading to caregiving and is consistent with the conceptualization of caregiving as a discrete life course event (Choi and Marks 2006; Moen 1996; Moen, Robison, and Dempstermcclain 1995; Moen, Robison, and Fields 1994).

Second, I also acknowledge the possibility of multiple transitions in/out of the caregiving role. However, rates of multiple transitions are presumably low and the discrete-time models described below will treat repeated events as one event (i.e., women are not at risk of subsequent events after their first transition). In addition, the EMWS data do not indicate whether "recurrence" to the caregiving role is for the same parent/in-law or another parent after a period of non-caregiving. Therefore, the current study focuses on the first (i.e., earliest observable) transition to caregiving that is most relevant to existing theory and potentially most consequential to middle-aged women. Finally, exposure to caregiving for parents and parents-in-law differs based on marital history. However, because the EMWS is a subsample of ever-married women, it is assumed that all women in this study are theoretically at risk of caring for their parents and parent-in-laws. In fact, preliminary analyses indicated that there are more than two dozen women who are not currently married and report providing care to their in-laws. Nevertheless, almost all of the women in this study are currently married (i.e., 93% of the sample and 96% among caregivers) and are exposed to the risks of caregiving to parents and parents-in-law. In discrete-time estimation, the hazard rate is defined as the conditional probability that an individual will experience an event (i.e., caregiving) at time t, given that the individual did not have an event at the beginning of time t. The ratio of these conditional probabilities is referred to as the odds of caregiving, or $\ln[P_t / 1 - P_t]$ in logit form. To determine the parametric specification that best captures the distribution of the events (i.e., transitions to caregiving) across age, I evaluated various functional forms (e.g., piecewise exponential, log-linear, and curvilinear) using graphical plots, and tested model improvement over a constant-only model using standard Bayesian information criterion (BIC) and Akaike information criterion (AIC) statistics (Akaike 1974; Raftery 1995; Schwartz 1978). A linear function of the log odds was the best fitting and most parsimonious of the models evaluated, and thus, I use a formulation comparable to a Gompertz distribution to specify the model. The log odds of becoming a caregiver (i.e., discrete event) is a linear function of increasing age (i.e., duration variable) and a set of time-varying and time-invariant explanatory variables, expressed as:

$$\ln[P_{it} /(1 - P_{it})] = \alpha_t + \boldsymbol{\beta}'\mathbf{X}_{\mathrm{it}}, \qquad (1)$$

so that

$$\alpha_t, = \alpha_o + \alpha_1 t, \qquad (2)$$

where the log odds of becoming a caregiver in a sample of n independent observations (i = 1,2,3 ... n) at time t is a function of time, α_t, and a vector of independent variables $\mathbf{X}$, where $\boldsymbol{\beta}$ is a vector of parameters to be estimated. I incorporate time (α_t) as a linear function of age, so that time begins at some starting point α_o (baseline age) and increases ($\alpha_1 t$) until the age at which a caregiving transition occurs or becomes a censored observation. By reorganizing the data into age-based person-years, I use standard logistic regression models to estimate the parameters in equation (1) through conventional maximum-likelihood methods. Preliminary analyses used time as the underlying time-metric in the hazard models and yielded results that were consistent with the age-based models.

To execute the analyses, I constructed a person-year file from the EMWS data by expanding each woman's exposure time so that each observation includes a record for every additional age contributed beyond her baseline. The final observation for each woman in the data set includes either her age at first-reported caregiving or the age she was last observed prior to right censoring. Analytically, the person-year data delineate exposure and time-varying age is the linear duration variable (i.e., parameterization of risk across exposure) used to estimate caregiving events. Unlike the potential over-inflation of sample with pooled longitudinal data, observations are excluded following the first occurrence of caregiving status. Furthermore, the point estimates (and dispersion) are determined by the number of events and not the size of the sample in discrete-time analyses. All models used Huber–White sandwich estimators to account for the lack of independence across panel observations and to reduce unobserved heterogeneity bias. Observed rates of caregiving transitions are illustrated across age in Figure 2.1.

2.6 RESULTS: TRANSITIONS TO CAREGIVING

Descriptive Statistics

Table 2.3 reports descriptive statistics for the dependent and independent variables and statistical tests for differences between caregivers and non-caregivers. T-tests were calculated for continuous variables and chi-square tests were calculated for dichotomous variables. Approximately 7% of the EMWS sample report providing care to either their parents or parents-in-law. Among caregivers, 57% report providing care to their parents and 53% report providing care to their parents-in-law. There are 104 (10%) women who report caring for both their parents and parents-in-law at the same time. Caregivers are more likely to be older, live in the Northeast and Coastal areas, be urban residents, have more education and income, and have fewer children living in the household than non-caregivers. Rates of employment are also negatively associated with caregiving (75.6% versus 80.0%, respectively). Distributionally, the number of children living outside of the household does not statistically differ for women caregivers and non-caregivers.

As expected, co-residing with parents or parents-in-law and having at least one widowed parent or parent-in-law are significantly associated with women who are reported caregivers. More than 35% of caregivers co-reside with their parents or parents-in-law. In comparison, less than a quarter of non-caregivers (24.9%) live with their parents or parents-in-law. Widowhood of women's parents or parents-in-law is another bivariate risk factor for caregiving. More than 65% of caregivers have at least one widowed parent or parent-in-law, and yet, only 48% of non-caregivers have at least one widowed parent or parent-in-law. From the standpoint of community characteristics, caregivers are also significantly more likely to reside in communities with high levels of population density (25.6% vs. 19.9%), health infrastructure (41.1% vs. 35.2%), and economic activity (34.7% vs. 23.1%) than non-caregivers, respectively.

Discrete-Time Models for Transitions to Caregiving

Table 2.4 presents the estimated odds ratios (OR) from the discrete-time models predicting transitions to caregiving. Model 1 assesses sociodemographic differences in women's transitions to caregiving for parents and parents-in-laws. As expected, age is positively related to caregiving transition—for every additional year of age, the likelihood of becoming a caregiver increases by nearly 3% (OR=1.027; $p \leq .001$). Women in Inland areas are 31% (OR=0.690; $p \leq .001$) less likely to become a caregiver than women in coastal areas and women in mountain areas are 42% (OR=0.584; $p \leq .001$) less likely to experience a caregiving transition than women in coastal areas. Urban women are 41% (OR=1.407; $p \leq .001$) more likely to become a caregiver than rural women. Living in the Northeast has no significant impact on women's likelihood of becoming a caregiver.

Model 2 adds education and income as measures of caregiving resources. Contrary to expectations, women who have more than a primary education are significantly more likely to become caregivers (OR=1.439; $p \leq .001$) than women with less education. Model 3 includes the variables for social roles predicting transitions to caregiving. As hypothesized, married women are much more likely (OR=1.728; $p \leq .001$) to experience a caregiving transition than unmarried women. This finding concurs with expectations given that women marry with the prospects of caring for her spouse's parents as well as her own. Also as anticipated, the results show that employment is a significant factor that prevents women from assuming the role of caregiver (OR=0.859; $p \leq .05$). Compared to unemployed women, the odds of becoming a caregiver for one's parents or parents-in-law is reduced by approximately 14% for women who are employed.

Model 4 examines how caregiving risk factors impact women's likelihood of experiencing a caregiving transition. Results show that women who co-reside with their parents or parents-in-law are more than two times as likely to transition into caregivers as those who do not live with their parents or parents-in-law (OR=2.002; $p \leq .001$). Furthermore, having one or more widowed parents or parents-in-law significantly increases a woman's likelihood of becoming a caregiving (OR=1.820; $p \leq .001$) than those without widowed parents/in-laws.

Model 5 is the fully-adjusted model that includes sociodemographic characteristics, caregiving resources, social roles, and caregiving risks simultaneously. The findings show that age (OR=1.040; $p \leq .001$), urban residence (OR=1.189; $p \leq .05$), more than primary education (OR=1.411; $p \leq .001$), co-residence with parents/in-laws (OR=1.94; $p \leq .001$), and having any widowed parents/in-laws (OR=1.849; $p \leq .001$) are significant independent predictors of transitions to caregiving among women. Alternatively, living in Inland and Mountain areas (ORs=0.710 and 0.590; $p \leq .001$, respectively) and being employed (OR=0.846; $p \leq .05$) are significantly associated with lower rates of caregiving across age. Marital status is no longer a significant predictor of caregiving after other demographic factors, resources, roles, and risks are taken into account.

Discrete-Time Models for Community Characteristics and Transitions to Caregiving

Table 2.5 reports the estimated ORs for the effects of community characteristics on transitions to caregiving. Using the fully-adjusted model from Table 2.5 (Model 5), the results from Model 1 and Model 2 indicate that population density and health infrastructure are not statistically associated with the likelihood of becoming caregivers, net of the women's sociodemographic characteristics, caregiving resources, social roles, and caregiving risks. However, Model 3 shows that economic activity in the community is a strong predictor of caregiving transitions. Results suggest that a high level of economic activity significantly increases women's odds of becoming caregivers (OR=1.456; $p \leq .001$) compared to women in communities with low levels of economic activity.

Models 4 tests the interactions between women's caregiving resources (education and employment) and community-level characteristics (population density and health infrastructure) as hypothesized. Model 4 demonstrates that education influences women's transitions to caregiving more strongly in areas of high population density than in areas of low population density (OR=1.633; $p \leq .001$). Tests of interactions were also performed with urban/rural residence, income, employment status, co-residence with parents/in-laws, number of children, and widowhood of parents/in-laws with all three indicators of community characteristics, although none were significant in preliminary analyses.

Patterns of Caregiving Transitions for Parents and Parents-in-Law

The patterns of caregiving transitions for those who care for parents and for those who care for parents-in-law are reported in Table 2.6. For caregiving provided to either parental group, Model 1 shows that age significantly increases rates of caregiving and living in Inland and Mountain regions significantly decreases rates of caregiving relative to women living in coastal regions. However, urban residence is only a significant predictor of becoming a caregiver among women who care for their parents (OR=1.369; $p \leq .001$) and not among women who care for their in-laws.

Model 2 includes measures for caregiving resources, social roles, caregiving risks, and community characteristics. Overall, the associations for the sociodemographic factors remain largely unchanged with the inclusion of these covariates. In terms of caregiving resources, women with more than a primary-school education are only more likely to be caregivers for those providing for parents (OR=1.418; $p \leq .001$) and not necessarily for those providing for parents-in-law (OR=1.183; $p \leq .10$). In terms of social roles, women who work and those with greater numbers of children living outside of the household are less likely to be caregivers for those providing for their own parents (ORs=0.816 and 0.843; $p \leq .05$, respectively) but not for women providing for their in-laws.

The findings associated with caregiving risk factors are consistent with expectations. Women who were co-residing with parents are substantially more likely to be providing them care (OR=2.743; $p \leq .001$) than women who do not co-reside with their parents. Conversely, women who were co-residing with their parents-in-law are even more likely to be providing their in-laws care (OR=3.197; $p \leq .001$) than women who do not co-reside with their in-laws. Interestingly, co-residence with parents greatly reduces a woman's odds of becoming a caregiver for her parent-in-law (OR=0.371, $p \leq 0.05$); yet co-residence with parents-in-law does not significantly reduce a woman's odds of becoming a caregiver for their own parent (OR=0.923, $p > .10$). Having any widowed parent/in-law has a similar effect for women who provide care to their parents and parents-in-law. The effects of community characteristics are also comparable between the parental-care groups, with only economic activity significantly predicting greater odds of caregiving for both groups of women.

2.7 DISCUSSION AND CONCLUSION

This study provides the first documentation of rates of parental caregiving among ever-married women ages 18 to 52 in China. This study also provides the first comprehensive longitudinal analysis of the individual-level and contextual-level factors that are associated with women transitioning to the role of caregiver. Overall, I find significant differences in sociodemographic characteristics (H1), socioeconomic resources related to education (H2), and caregiving risks related to co-residence and parental widowhood (H4) among women transitioning to caregiving. I find only limited evidence that women's social roles (H3) and community characteristics (H5) are associated with transitions to caregiving. I discuss how these findings provide new insight into how life course processes shape women's exposure to and likelihood of providing caregiving in China.

My descriptive findings demonstrate that approximately 8% of women between the ages of 18 and 52 provide care to aging parents, parents-in-law, or both. Among them, 57% report providing care to their parents and 53% report providing care to their parents-in-law. The higher percentage of women who care for their parents than for their parents-in-law is a pattern that is contrary to cultural expectations. However, this finding echoes recent evidence of married daughters—particularly those living with parents—who provide more financial assistance to their aging parents than do sons in urban China (Xie and Zhu 2006). Nevertheless, these distributions greatly underestimate the lifetime rates of transferring time to older parents, given the (young) age of caregivers in the sample.

Results from multivariate discrete-time models show that women who are parental caregivers in China are more likely to be older, live in the Northeast, Coastal, and urban areas, have more education and income, have greater numbers of children living in the household, and more likely to reside in communities with high levels of population density, health infrastructure, and economic activity than non-caregivers. Caregivers are also significantly less likely to work and much more likely to co-reside with their parents or parents-in-law and to have widowed parents/in-laws compared to non-caregivers.

These results suggest that a combination of demographic factors, structural forces, and filial norms shapes women's exposure to caregiving risks. Moreover, there are several life course concepts that are important to our understanding of parental caregiving in China. From a structural standpoint, the findings highlight the centrality of the contextual embeddedness of life transitions for women. In particular, I demonstrate significant and robust differences related to geographic region, urban-rural residence, education, and community characteristics in women who become caregivers and those who do not. Women who live in Coastal regions, urban areas, and in communities with high levels of economic activity have greater odds of transitioning to caregiving than women residing in other contexts.

These patterns are consistent with the findings that women from socially and structurally advantaged groups are significantly more likely to become caregivers than their counterparts. Most notably, women who have higher levels of education (especially in areas of high population density) are significantly more likely to become caregivers than women with lower levels of education. Taken together, these findings demonstrate the entrenched and pervasive influence of filial norms in contemporary China. Perhaps the most compatible theoretical explanation for these findings can be likened to the altruistic perspective. Originally developed by Becker (e.g., 1974, 1981, 1991), this viewpoint emphasizes the altruistic (selfless) nature of individual behavior that is motivated by the well-being of others. In the current study, caregiving can be viewed as altruistically motivated by benevolence and the greater welfare of one's family rather than calculated personal returns. Accordingly, women with higher levels of education do not "buy their way out" of their caregiving responsibilities. Instead, my findings suggest that these better educated women utilize their resources to care for their parents and/or parents-in-law. It is possible that these women are better situated to choose jobs (or manage work) to ensure more flexible schedules that allow them to fulfill their filial responsibilities. An alternative explanation is that more educated women have fewer siblings, and therefore, fewer siblings to share caregiving responsibilities. However, I am unable to assess the validity of this explanation due to a lack of information on siblings in the EMWS.

Another interpretation is possible for the finding that advantaged women have higher rates of caregiving. That is, the association may reflect the availability of educated women who find work in areas close to home—presumably in urban areas—compared to less-educated women who migrate with their spouse (or by themselves) to find better employment opportunities away from their parents and/or parents-in-law. If this is the case, it also reflects the dire situation in rural areas and less developed regions where there is a dearth of caregivers for the elderly because of massive rural-urban migration. This problem is even further magnified by the greater care needs of elderly in rural areas who have worse physical and psychological health than the elderly in urban areas (Zimmer, Kaneda, and Spess 2007; Zimmer, Wen, and Kaneda 2010).

China's investments and policies toward development have been strategically allocated in number, location, and across time (Bell, Khor, and Kochhar 1993). However, these efforts have translated into massive regional and urban-rural inequalities in resources and the availability of caregivers to provide care to their aging parents and parents-in-law. Some may argue that regional differences in economic development and welfare systems are an inevitable byproduct of progress for a newly developing nation. Regardless, China's growing pains will continue to intensify in an era of rapid population aging (Chen and Liu 2010) and those most affected are the most vulnerable segments of the population. Policymakers are encouraged to prioritize the interests of older adults and their care-providers and reduce structural barriers that currently limit access to old-age care.

Policymakers are especially encouraged to focus on women at older ages, who face increasing risks of illness and disease while shouldering the growing healthcare needs of others. Age is an understandably strong predictor of caregiving in this study and is consistent with the life course concept of timing and the importance of when and how individuals experience life course transitions (Turner, Killian, and Cain 2004). Unless the investments of women are met with viable alternatives, the increasing demands of old-age support will exceed the ability of aging women to care for themselves and their parents/in-laws. Greater investments in healthcare resources and support systems—such as institutional care facilities, community centers, and rehabilitative units—will help alleviate the burden of caregiving, particularly among older women.

The interdependence of life spheres was partially supported by the finding that engaging in other social roles reduces women's likelihood of transitioning to caregiving. Results show that working women have significantly lower odds of becoming a caregiver than their non-working counterparts. However, having children does not significantly affect a woman's chance of becoming a caregiver, regardless of whether the children lived inside or outside of the household. Marital status is not a significant predictor of caregiving transition in the fully-adjusted model. However, this finding needs to be interpreted with caution because this sample includes ever-married women and excludes single women.

The concept of linked lives received strong support in my analysis of EMWS data. I find that women who co-reside with their parents or parents-in-law are more than two times as likely to transition into caregivers as those who do not live with their parents or parents-in-law. Similarly, having one or more widowed parents or parents-in-law significantly increases a woman's likelihood of becoming a caregiving than those without widowed parents/in-laws. As a corollary of linked lives, the evidence also supports the perspective of altruism which argues that caregiving behaviors are motivated by their aging parents' welfare, interests, and physical needs (Becker 1974). Altruism is presumably greater among those with linked lives.

There are interesting differences in the factors that predict caregiving for parents and parents-in-law. For example, women who work and those with greater numbers of children living outside of the household are less likely to be caregivers for their own parents but not for their parents-in-law. The finding that employment differentially influences women's chances of becoming caregivers for their own parents and for their in-laws underscores the patrilineal norms in China—i.e., that employment can alleviate women of their caregiving obligations for their parents but less so for their parents-in-law. Employment appears to put in place greater hurdles for Chinese women to fulfill filial responsibilities to their parents. In addition, childrearing responsibilities appear to reduce women's likelihood of providing care to their parents but not to their parents-in-law. This finding highlights the pervasive and lingering influence of patrilineal norms in contemporary Chinese society. When women have to juggle responsibilities from multiple roles they are unlikely to take on caregiving roles for their parents. However, these demands do not exempt them from the filial responsibilities of caring for their husband's parents.

Despite the strengths of this study, I acknowledge several limitations. First, the age range of the sample is limited to 18-52 years. Although this age-range captures an important and lengthy period of a woman's life course, the majority of their parents are relatively young and healthy, and thus, exposure to caregiving has not reached its highest levels. Therefore, the prevalence of women providing care to parents and/or parents-in-law in China is presumably underestimated. Second, data limitations prohibited me from including several important measures. For example, additional variables for care provided by siblings, spouses, or other relatives, attitudes toward filial piety, and relationships with parents/in-laws, would help to better contextualize and understand the current findings. In particular, information is missing on the migration status of women's spouses and siblings. Finally, this study only includes ever-married women whose caregiving behaviors may differ from those who have never been married. Therefore, the findings in this study cannot be generalized to never married women.

In conclusion, this study makes substantial contributes to the literature on caregiving by demonstrating how various individual and structural factors are associated with transitions to caregiving in China. Overall, the evidence underscores the strength of filial norms in China. With few exceptions, I find that socially and structurally advantaged women are more likely to provide care to their parents and parents-in-law that their disadvantaged counterparts. However, I also find evidence that modern Chinese women are redefining traditional family obligations by increasingly providing care for their own parents (in addition to their parents-in-law). Various individual-level and contextual-level processes played a role in determining women's likelihood of becoming a caregiver. In particular, I demonstrate support for the life course concepts of timing, the interdependence of life spheres, linked lives, and life course development in incident patterns of caregiving. In sum, this study provides new insights into the factors associated with caregiving and provides actionable knowledge for alleviating the burden of caregiving among women in China.

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Table 2.1. Chinese Law Enacted in 1996 to Ensure the Economic and Social Rights of the Aged: Selected Articles (Translated)

- The main source of old-age support is family and family members should support and care for the elderly.
- Adult children and other family relatives are obligated to provide financial assistance, physical care, psychological support, and other special needs to the elderly. Spouses play a supplemental role in elder care.
- Adult children and other family relatives are obligated to pay for health care and provide physical care for the sick elderly.
- Adult children and other family relatives are obligated to provide housing to the elderly or make repairs for housing units if they are in poor condition.
- Adult children and other family relatives are obligated to provide assistance in field work and help raise live stock for the elderly; and profits belong to the elderly.
- Adult children and other family relatives cannot abandon their caregiving responsibilities. If they do not provide care, elderly have the right to demand allowances.

Table 2.2 Characteristics of Surveyed Provinces

Region	Province	Total Fertility Rate	Life Expectancy	Dependency Ratio	% Urban Population	GDP Per Capita (in $)	Old-age Security Per Capita
Northeast	Liaoning	1.2	75.4	27.8	60.4	3654	10495.5
	Heilongjiang	1.4	74.6	25.4	55.5	2748	9594.3
Inland	Henan	1.7	73.7	41.6	37.7	2684	10558.4
	Hubei	1.7	73.4	29.9	46.0	2752	10345.1
	Hunan	1.8	73.1	37.7	43.2	2567	9824.6
Mountain	Guangxi	1.9	73.6	44.8	39.2	2166	10310.8
	Guizhou	1.8	69.7	51.0	29.9	1064	10930.5
Coastal	Jiangsu	1.3	75.9	31.4	55.6	4847	12697.0
	Shandong	1.7	75.9	34.4	48.3	4846	15733.0

Source: Peng, Xizhe. 2011. China's Demographic History and Future Challenges. *Science*, 581-588.

Table 2.3 Descriptive Statistics for Selected Dependent and Independent Variables (N=16,634)

	Total Sample (N=16,634)		Non-caregivers (n=15,548)		Caregivers (n=1,086)		
	Mean	SD	Mean	SD	Mean	SD	
Caregiver	0.065	0.247					
Caregiver for parents	0.037	0.189			0.565	0.496	
Caregiver for in-laws	0.035	0.183			0.530	0.499	
Sociodemographic Characteristics							
Age	37.848	8.306	37.734	8.370	39.479	7.135	***
Northeast (vs. Coastal)	0.188	0.391	0.184	0.388	0.245	0.430	***
Inland (vs. Coastal)	0.353	0.478	0.357	0.479	0.308	0.462	*
Mountain (vs. Coastal)	0.236	0.424	0.240	0.427	0.177	0.382	***
Urban (vs. rural)	0.284	0.451	0.280	0.449	0.347	0.476	***
Caregiving Resources							
Education (vs. primary school or less)	0.551	0.497	0.546	0.498	0.627	0.484	***
Family Income (vs. lowest quintile)	0.815	0.388	0.813	0.390	0.843	0.364	*
Social Roles							
Married status (vs. not married)	0.933	0.250	0.931	0.254	0.960	0.195	***
Working (vs. not working	0.797	0.402	0.800	0.400	0.756	0.430	***
# children in household	1.274	0.967	1.281	0.973	1.204	0.898	**
# children outside household	0.380	0.759	0.377	0.759	0.396	0.768	
Caregiving Risks							
Co-residing with parents/in-laws (vs. no)	0.256	0.436	0.249	0.432	0.351	0.477	***
Having widowed parents/in-laws (vs. no)	0.489	0.500	0.477	0.500	0.652	0.477	***
Community Characteristics							
Population density (vs. low)	0.203	0.402	0.199	0.400	0.256	0.437	***
Health infrastructure (vs. low)	0.356	0.479	0.352	0.478	0.411	0.492	***
Economic activity (vs. low)	0.239	0.426	0.231	0.422	0.347	0.476	***

Note: Sample sizes are based on person-year observations and significance is calculated from *t* tests for continuous variables and $\times^2$ tests for categorical variables.*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$, two-tailed test

Table 2.4 Discrete-Time Models for Transitions to Parental Caregiving in China (N=16,634)

	Model 1	Model 2	Model 3	Model 4	Model 5
Sociodemographic Characteristics					
Age	1.027***	1.032***	1.028***	1.035***	1.040***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Northeast (vs. Coastal)	1.089	1.030	1.075	1.227*	1.146
	(0.095)	(0.091)	(0.094)	(0.111)	(0.105)
Inland (vs. Coastal)	0.690***	0.678***	0.703***	0.712***	0.710***
	(0.057)	(0.057)	(0.059)	(0.060)	(0.061)
Mountain (vs. Coastal)	0.584***	0.585***	0.616***	0.567***	0.590***
	(0.056)	(0.056)	(0.059)	(0.055)	(0.058)
Urban (vs. rural)	1.407***	1.252***	1.351***	1.381***	1.189*
	(0.093)	(0.088)	(0.093)	(0.092)	(0.087)
Caregiving Resources					
Education (vs. primary school or less)		1.439***			1.411***
		(0.104)			(0.103)
Family Income (vs. lowest quintile)		0.988			0.994
		(0.087)			(0.090)
Social Roles					
Married status (vs. not married)			1.728***		1.279
			(0.285)		(0.211)
Working (vs. not working)			0.859*		0.846*
			(0.065)		(0.064)
Number of children in household			0.932		0.949
			(0.034)		(0.038)
Number of children outside household			0.910		0.940
			(0.045)		(0.048)
Caregiving Risks					
Co-residing with parents/in-laws (vs. not)				2.002***	1.964***
				(0.150)	(0.150)
Having widowed parents/in-laws (vs. none)				1.820***	1.849***
				(0.120)	(0.124)
Constant	0.028***	0.020***	0.020***	0.012***	0.008***
	(0.004)	(0.004)	(0.004)	(0.002)	(0.002)

Note: standard errors in parentheses.
*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$, two-tailed test

Table 2.5 The Effects of Community Characteristics on Transitions to Parental Caregiving in China (N=16,634)

	Model 1	Model 2	Model 3	Model 4
Sociodemographic Characteristics				
Age	1.039*** (0.005)	1.039*** (0.005)	1.036*** (0.005)	1.039*** (0.005)
Northeast (vs. Coastal)	1.163 (0.107)	1.142 (0.105)	1.186 (0.110)	1.152 (0.106)
Inland (vs. Coastal)	0.715*** (0.062)	0.706*** (0.061)	0.727*** (0.063)	0.713*** (0.062)
Mountain (vs. Coastal)	0.596*** (0.059)	0.582*** (0.058)	0.608*** (0.060)	0.596*** (0.059)
Urban (vs. rural)	1.155 (0.087)	1.159* (0.086)	1.089 (0.084)	1.144 (0.087)
Caregiving Resources				
Education (vs. primary school or less)	1.400*** (0.102)	1.395*** (0.102)	1.331*** (0.099)	1.288*** (0.103)
Family Income (vs. lowest quintile)	0.988 (0.089)	0.980 (0.089)	0.974 (0.089)	0.996 (0.090)
Social Roles				
Married status (vs. not married)	1.288 (0.213)	1.284 (0.211)	1.314 (0.217)	1.287 (0.212)
Working (vs. not working)	0.847* (0.064)	0.848 (0.064)	0.887 (0.068)	0.838 (0.063)
Number of children in household	0.953 (0.038)	0.953 (0.038)	0.982 (0.040)	0.956 (0.038)
Number of children outside household	0.945 (0.049)	0.950 (0.049)	0.968 (0.050)	0.949 (0.049)
Caregiving Risks				
Co-residing with parents/in-laws (vs. not)	1.952*** (0.149)	1.953*** (0.149)	1.962*** (0.151)	1.945*** (0.149)
Having widowed parents/in-laws (vs. none)	1.850*** (0.124)	1.850*** (0.124)	1.853*** (0.125)	1.854*** (0.125)

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Table 2.5 (Cont.)

	Model 1	Model 2	Model 3	Model 4
Community Characteristics				
Population density (vs. low)	1.116 (0.087)			0.771 (0.128)
Health infrastructure (vs. low)		1.125 (0.077)		
Economic activity (vs. low)			1.456*** (0.115)	
Interactions				
Education*population density				1.633*** (0.301)
Constant	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)	0.009*** (0.002)

Note: standard errors in parentheses.
*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$, two-tailed test

Table 2.6 Discrete-Time Models for Transitions to Caregiving for Parents and Parents-in-Law in China (N=16,634)

	Caregiving for Parents		Caregiving for In-laws	
	Model 1	Model 2	Model 1	Model 2
Sociodemographic Characteristics				
Age	1.035*** (0.005)	1.031*** (0.006)	1.028*** (0.005)	1.038*** (0.007)
Northeast (vs. Coastal)	1.087 (0.122)	1.168 (0.136)	0.898 (0.110)	1.092 (0.141)
Inland (vs. Coastal)	0.630*** (0.069)	0.676*** (0.076)	0.658*** (0.074)	0.705** (0.083)
Mountain (vs. Coastal)	0.491*** (0.064)	0.573*** (0.078)	0.624*** (0.079)	0.589*** (0.078)
Urban (vs. rural)	1.369*** (0.124)	1.044 (0.104)	1.155 (0.113)	1.076 (0.116)
Caregiving Resources				
Education (vs. primary school or less)		1.418*** (0.143)		1.183 (0.118)
Family Income (vs. lowest quintile)		1.165 (0.154)		0.813 (0.094)
Social Roles				
Married status (vs. not married)		1.306 (0.260)		1.720 (0.488)
Working (vs. not working)		0.816* (0.079)		0.940 (0.098)
Number of children in household		0.904 (0.049)		1.031 (0.056)
Number of children outside household		0.843* (0.062)		1.079 (0.071)
Caregiving Risks				
Co-residing with parents (vs. not)		2.743*** (0.436)		0.371* (0.156)
Co-residing with parents-in-law (vs. not)		0.923 (0.106)		3.197*** (0.335)
Having widowed parents/in-laws (vs. none)		1.911*** (0.169)		1.748*** (0.162)

(Continued on next page)

Table 2.6 (Cont.)

	Caregiving for Parents		Caregiving for In-laws	
	Model 1	Model 2	Model 1	Model 2
Community Characteristics				
Population density (vs. low)		1.094		0.992
		(0.110)		(0.110)
Health infrastructure (vs. low)		1.050		1.130
		(0.094)		(0.108)
Economic activity (vs. low)		1.602***		1.327**
		(0.160)		(0.145)
Constant	0.007***	0.006***	0.016***	0.003***
	(0.002)	(0.002)	(0.004)	(0.001)

Note: standard errors in parentheses.
*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$; # $p \leq 0.05$, two-tailed test

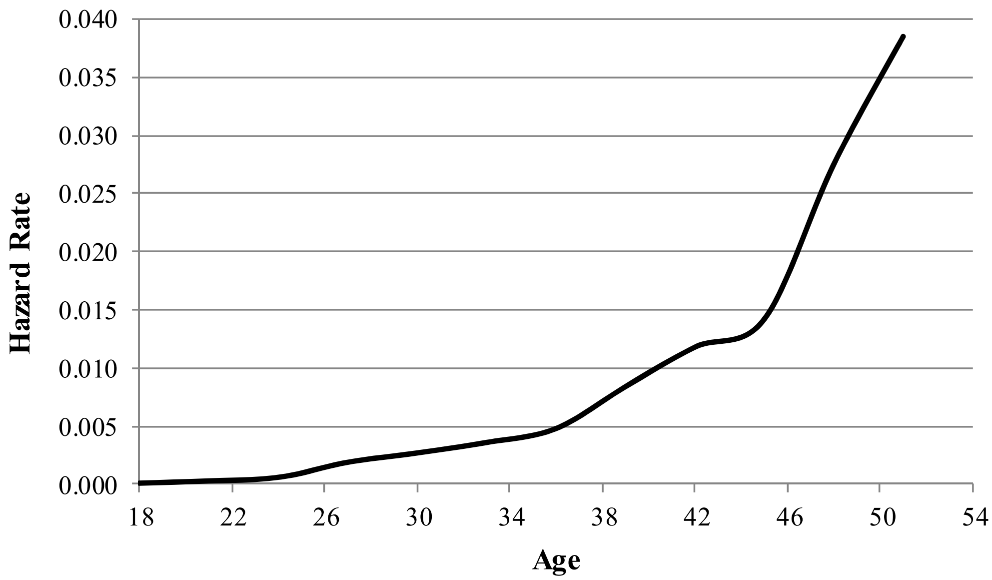

Figure 2.1 Observed Rate of Caregiving

CHAPTER 3

DETERMINANTS OF TIME SPENT ON PARENTAL CARE AMONG YOUNG-ADULT AND MIDDLE-AGED WOMEN IN CHINA

3.1 INTRODUCTION

Intergenerational exchange describes the process of exchanging emotional, financial, and practical support across generations (see Silverstein and Bengtson 1997), and provides the framework for how and why family members provide assistance and care when needed. In the United States, intergeneration exchange is primarily characterized by downward transfers of support from aging parents to their adult children (Berry 2001; 2008). In contrast, in many developing countries, upward transfers from adult children to their elderly parents are by far the more prevalent patterns of intergenerational support. Upward transfers of financial and instrumental support are especially common in China where a nationally instituted support system is not well-established for the elderly.

Rapid population aging, low fertility, women's high labor force participation, and massive rural-urban migration have introduced new and unprecedented challenges to individuals and families in China (Chen and Liu 2009; Peng 2011). These profound societal changes have called into question the viability of traditional family values in its old-age support system: Is intergenerational support sustainable in contemporary China? What factors promote or constrain women's provision of care?

There are three major forms of intergenerational support: financial support, time transfer, and co-residence (Bianchi et al. 2008). In China, financial support and co-residence have been studied extensively (e.g., Logan and Bian 1999; Zimmer and Kwong 2003; Chen 2005). However, much less is known about patterns of time transferred from adult children to aging parents. Studies of parental caregiving in China often rely on convenience samples and are limited to specific geographic regions (e.g., Zhan 2000). To date, research has not examined the changing patterns of care provision in China using large-scale and/or longitudinal data. I address this limitation by employing population-based panel data to examine the patterns and predictors of time spent on caregiving by ever-married women in China. My research focuses exclusively on young-adult and middle-aged women because (i) existing research shows that women are significantly more vulnerable to the negative effects of caregiving than men, (ii) daughters and daughters-in-law provide the majority of care for the aging population in China, as defined by strong traditional norms, and (iii) data on parental caregiving is limited in general, and specifically to women aged 18 to 52 in the China Health and Nutrition Survey (CHNS).

3.2 BACKGROUND

For centuries, China has been the largest patriarchal, patrilocal, and patrilineal society in the world (Thornton and Lin 1994), and the influence of intergenerational relations and family values on individuals has been strong (Lou 2007; Purnell and Paulanka 2008). Traditionally, sons are considered the primary caregivers for their aging parents. Even nowadays, sons and daughters-in-law in China are equally, if not more, likely than daughters to provide the majority of care for their elderly family members (Wang et al. 2010); and aging parents are more likely to live with their sons and daughters-in-law than with their daughters in later life (Chen 2005).

Similar to other cultures, gendered patterns of household division of labor still prevail in China. As the primary breadwinner, a man typically provides the financial support for his parents; whereas his wife (i.e., daughter-in-law) is typically responsible for the daily caregiving tasks for older adults. According to traditional Chinese norms, daughters are not expected to play a central role in providing support to their parents. However, young, educated, professional women seem to be redefining the traditional sources of caregiving (i.e., daughters-in-law were dominant caregivers for parents-in-law) and are no longer playing the role of subservient daughters-in-law. Instead, it is increasingly common for daughters to share caregiving responsibilities with their male siblings. Recent research suggests that patriarchal, patrilocal, and patrilineal norms in China may be changing as married daughters—especially those living with parents—provide more financial assistance to their aging parents than do sons in urban areas (Xie and Zhu 2006). Similarly, adult daughters are shown to provide the same levels of support as adult sons (Whyte and Xu 2003). In fact, researchers have noted that oldest-old parents who live with their daughter(s) often report improved emotional health in China (Chen and Short 2008).

Since the implementation of the one-child policy in the late 1970s, norms guiding caregiving expectations and behaviors have evolved to reflect the needs of Chinese families with only daughters—whom parents must depend on care at older ages. In response, young Chinese women have largely embraced these new filial responsibilities for their aging parents. Indeed, a recent study of children of the one-child policy shows that girls report greater obligations to provide parental care than boys (Zhan 2004). With the weakening of filial piety in modern China, undue pressures and strain have arisen from the close and extensive interactions between older (traditional) generations and younger (contemporary) generations (Whyte 2004; Cheung and Kwan 2009). As a result, Chinese women are facing greater challenges actively participating in the labor force while providing the necessary care to support the needs of their aging family member. To the best of my knowledge, this study will be the first to use a large-scale dataset to examine caregiving patters among women in China. In particular, this study contributes to the literature by providing new insights on how the predictors of parental care differ between daughters and daughters-in-law.

3.3 THEORETICAL FRAMEWORK AND HYPOTHESES

Life course theory is uniquely oriented to guide the longitudinal examination of predictors of care provision. A life course approach to caregiving recognizes the systematic and patterned events experienced by individuals and families as they age (White and Klein 2002). Previous studies have identified four theoretical concepts from a life course perspective that are particularly informative for understanding patterns of caregiving involvement. These include (i) the contextual embeddedness of life transitions, (ii) the interdependence of life spheres, (iii) the notion of linked lives, and (iv) life course development (Moen 1996; Szinovacz 2003; Szinovacz and Davey 2007).

Although many of the factors predicting caregiving time are similar to those proposed for caregiving transitions (Chapter 2), important differences are also anticipated. For example, the previous chapter demonstrated that employment status does not influence a women's likelihood of becoming a caregiver once health infrastructure or economic activity is accounted for. However, it is reasonable to predict that women's employment may reduce the amount of time spent on caregiving tasks. For this and related reasons, it is important to conceptualize caregiving time and transitions as distinct life course dimensions of caregiving that merit separate investigation. In the following sections, I operationalize the life course concepts of contextual embeddedness, interdependence, linked lives, and life course development (i-iv) and address several sets of questions.

First, in terms of *sociodemographic characteristics*, does being older, living in rural areas, and living in less developed areas put women at greater risk of spending more time on caregiving? Second, in terms of *socioeconomic resources*, are women with higher socioeconomic status (SES) protected from higher levels of caregiving burden than women with lower SES? With regard to *social roles*, are working women protected from more intense caregiving responsibilities than non-working women? In terms of *caregiving risks*, are women motivated by altruism to spend more time in caring for parents/in-laws with greater needs? Finally, with regard to *community characteristics*, does the amount of time devoted to caregiving differ across community contexts? I now discuss in detail how these concepts are related to previously hypothesized predictors of caregiving.

Contextual Embeddedness of Life Transitions

Sociodemographic factors largely define the position of individuals in society; contextual factors also structure how support and resources are exchanged across individuals and generations. These individual and contextual characteristics can be considered resources as well as constraints in their influence on levels of caregiving involvement. In the framework of contextual embeddedness, adult children are defined by their sociodemographic attributes and their location within a larger social structure that either promote or suppress motivations and their ability to provide care for their parents.

Based on the large regional and urban-rural differences throughout China, I hypothesize that there are significant regional and urban-rural differences in women's time spent on caregiving. I also hypothesize that community context—defined by population density, health infrastructure, and economic activity—will influence the amount of care that women provide for their parents and parents-in-law in China.

The Interdependence of Life Spheres

The interdependence of life spheres describes the close relationship among various life spheres (e.g., work, family, and leisure). As expected and previously shown, commitments in one life sphere may limit the levels of involvement one can invest in other spheres of life (Szinovacz and Davey 2007). For example, adults who are currently married may spend less time caregiving than those who are not currently married because they may be obligated to spend more time on household tasks (or leisure) with their spouses.

Accordingly, Laditka and Laditka (2001) find that adult daughters without partners spend significantly more time helping their parents than adult daughters with partners. Similarly, studies show that child-rearing responsibilities also reduce women's availability for caregiving (Johnson and Favreault 2001). The relationship between employment and caregiving is more complex. Some studies find that employment reduces the amount of time spent on caregiving by half among daughters (Lang and Brody 1983); whereas other studies show that working women do not provide less care than non-working women (Brody and Schoonover 1986). I hypothesize that women's social roles (i.e., marital status, work, and child-rearing) will affect their time spent on caregiving.

Linked Lives

The principle of linked lives suggests that individuals' lives are closely linked in the context of families (Elder 2003). In the perspective of this connectedness, the heightened needs of aging parents (due to health-decline and debilitating illness) are likely to promote adult children to provide care. The greater the needs that parents may have, the more intense the care that adult children are likely to provide. Therefore, I hypothesize that parents' widowhood will increase the amount of time that women spend on caregiving because widowed parents require more assistance. Unlike financial transfers that are not constrained by proximity, time-intensive (hands-on) care is only possible when children live in close proximity to, or together with, their parents. In particular, the physically demanding and time-consuming tasks of assisting with toileting, grooming, and bathing can only be achieved among those living in the same location. Therefore, I hypothesize that co-residence also increases the time that women spend on caregiving.

Life Course Development

The concept of life course development suggests that individuals' exposure to caregiving responsibilities change over time in response to their resources (Moen 1996; Szinovacz and Davey 2007). To understand the dynamic process of caregiving, it is important to consider the role of socioeconomic resources (i.e., SES) that reflect the current and changing life circumstances of adult children. As China witnesses enormous economic growth under its market economy, class differentials are widening in society (Wu 2002; 2010). Not surprisingly, socioeconomic resources (and inequalities) will increasingly influence the lives of individuals in China and inevitably extend across many life spheres, including access to health care, health behaviors and lifestyle, and family relationships. Accordingly, researchers are finding that differences in education and income are translating into significant gaps in health status among older adults (Chen, Yang, and Liu 2010). Therefore, guided by the concept of life course development, I hypothesize that adult children's resources will shape their levels of caregiving involvement. For an individual who is willing to shoulder caregiving responsibilities, socioeconomic resources can provide flexible work schedules that can accommodate their caregiving activities. In contrast, for individuals unwilling to meet caregiving obligations, socioeconomic resources allow them to purchase alternative care, and thus, exempt themselves from performing tedious caregiving tasks.

Hypotheses

Based on these established concepts in life course theory and previous research, I summarize my general hypotheses below:

H1: The sociodemographic characteristics of adult women (i.e., age, geographic location, and urban-rural residence) will influence women's time spent on parental caregiving.

H2: Caregiving time will be significantly associated with levels of socioeconomic resources (i.e., education and family income) among adult children as suggested by a life course development perspective.

H3: According to the interdependence of life spheres, women's social roles (i.e., marital status, work, and child-rearing) will significantly influence their time spent on caregiving.

H4: Caregiving risks that emerge from linked lives (i.e., co-residence and widowed parents/in-laws) will be significantly associated with adult children's caregiving time.

H5: The contextual embeddedness of life transitions suggests that in addition to regional and urban-rural differences, the community context (i.e., population density, health infrastructure, and economic activity) of adult children will significantly influence women's time on care provision for their parents and parents-in-law.

H6: The predictors of parental caregiving involvement will differ for daughters and daughters-in-law according to the patriarchal, patrilocal, and patrilineal norms in Chine.

3.4 DATA

I use seven panels of longitudinal data from the China Health and Nutrition Survey (CHNS) in 1991, 1993, 1997, 2000, 2004, 2006, and 2009. I select a subsample of women aged 18 and above in the Ever Married Women Survey (EMWS) of CHNS who reported the time they spent on parental care. The sample used for analyses includes a subsample of women aged 18 to 52 in the Ever Married Women Survey (EMWS) of CHNS who reported the time they spent on parental care. Although the sample is limited to young-adult and middle-aged women and precludes generalization of the findings to women of all women ages and those who never married, this study captures a substantial portion of the life course for adult women in a period that is substantively rich in the competing demands (and consequences) of caregiving with other social roles. The analytic sample consists of 6,805 women with complete data who contributed 19,898 person-years of observation in the period 1991 through 2009. Approximately 1,337 records were dropped due to missing values on any of the variables included in the prospective models (about 6%). Therefore, the multi-record working sample consists of 2,704 ever-married women 1991, 2,584 in 1993, 2,869 in 1997, 3,008 in 2000, 3,117 in 2004, 3,130 in 2006, and 2,486 in 2009. At baseline, there were 2,704 women who entered the survey in 1991 (40%), 330 in 1993 (5%), 1,098 in 1997 (16%), 640 in 2000 (9%), 934 in 2004 (14%), 506 in 2006 (7%), and 593 in 2009 (9%).

The CHNS has two major strengths for the purposes of this study. First, the longitudinal design allows me to observe respondents at multiple time points and establish causal relationships. The long duration of data captures the enormous societal, social, and cultural shifts in contemporary China and enables me to assess the changes in determinants of levels of caregiving over time. Second, CHNS has intensive information on caregiving for each parent and parent-in-law. Not only were respondents asked to provide information on whether they provide elder care, but they were also asked to report the number of hours they spent on elder care.

3.5 MEASURES

Dependent Variables

I examine three dependent variables: time caring for parents, time caring for parents-in-law, and time caring for both parents and parents-in-law. I computed the dependent variable for the amount of time caring for parents by adding the time spent taking care of mothers and fathers to capture the total time spent on caring for parents. Similarly, I computed the dependent variable for the amount of time caring for parents-in-law by adding the total time spent taking care of mothers-in-law and fathers-in-law to capture the time spent on caring for parents-in-law. The third dependent variable –time spent on parental care – was computed by summing the time spent on caring for both parents and parents-in-law to reflect the overall time spent on providing elderly care.

Independent Variables

I examine five groups of independent variables including sociodemographic characteristics, socioeconomic resources, social roles, caregiving demands, and community characteristics. The first group of variables include age (in years, continuous), urban/rural residence (urban=1), and geographic region (Northeast, Inland, and Mountain each coded 1 and in reference to Coastal). The second set of independent variables identifies women's resources, ascertained by levels of socioeconomic status. Educational attainment is categorized according to women with high school or above levels of education (coded 1) and those with a primary level of education or less; household per capita income is coded as 1 if individuals are not in the lowest quintile of the income distribution.

The third group of independent variables captures the social roles that women occupy during their adult lives, which may influence the amount of time spent on caregiving. Social roles are measured by marital status (coded 1 if currently married), employment status (coded 1 if currently working and 0 if not currently working or retired), and the number of children living inside and outside of the household (each coded continuously). The fourth category of independent variables takes into account the effects of caregiving risks. Caregiving risks are measured by co-residence and having widowed parents/in-laws. Although the health status of parents and parents-in-law was not measured, I examined an indicator for whether parents or parents-in-law are in need of care as a proxy for their health status as a caregiving risk factor. However, this variable was ultimately dropped because it correlates almost perfectly with caregiving status.

The final group of variables that I investigate include three contextual factors that measure community characteristics, including population density, health infrastructure, and economic activity. The definitions for each of these variables are as follows: Population density is the total population of the community divided by the size of the community area, obtained from official records. Health infrastructure is measured as the number and type of health facilities in or around the community (~12 km radius) and the number of pharmacies in the community. Economic activity is measured as the typical daily wage for ordinary male workers (reported by community officials) and the percent of the population engaged in non-agricultural work (Jones-Smith and Popkin, 2010).

3.6 ANALYTICAL STRATEGY

To execute the analyses, I constructed a person-year file from the EMWS data. The sample used for analysis is comprised of 6,805 women whose data provided a person-year sample of 19,898 observations based on all available interviews for each subject. The analyses of caregiving time are conducted with a series of random effects regression models using the EMWS panel dataset with repeated observations. As previously shown, the use of panel data and random effects models for estimation help minimize bias due to unmeasured heterogeneity because the repeated measures of individuals allow researchers to control for unmeasured heterogeneity (Lockwood and McCaffrey, 2007).

I model parental caregiving hours (H_{it}) by caregivers in community i at time t (1991, 1993, 1997, 2000, 2004, 2006, 2009) as a function of the characteristics of the caregivers and the community. The equation is as follows:

$$H_{it} = aD_{it} + bS_{it} + cR_{it} + dC_{it} + dM_{it} + \alpha_i$$

All of the explanatory variables in the analysis are time-varying and the (exponentiated) coefficient estimates are weighted averages of the within-individual (i.e., change across age) and between-individual effects. I treat the residual as a time-invariant random variable and assume it takes a normal distribution N(0, σ_i). All models adjust for sociodemographic background (D_{it}) (i.e., age, urban/rural residence, and region). The first models examine the effects of socioeconomic measures (S_{it}). The second model ncludes social roles (R_{it}) and the fourth model includes measures of caregiving risks (C_{it}). The final model includes contextual factors reflecting social and cultural differences across communities (M_{it}).

3.7 RESULTS

Descriptive Statistics

Table 3.1 reports descriptive statistics for the dependent and independent variables used in the analyses of the determinants of time spent on caregiving. The average age of women across repeated observations in the sample is 38 years. Approximately 8% of the EMWS sample report being caregivers (4.3% for parents and 4.1% for parents-in-law) and an additional 9% of women report having caregiving responsibilities that are not met. Caregivers report spending approximately 13 hours per week on care responsibilities (approximately 11 hours for parents and for parents-in-law and approximately 24 hours per week for women who care for both).

Most respondents live in rural areas in China, with only about 30% living in urban areas. More than a quarter of women live with parents or parents-in-law and approximately half of the women have at least one widowed parent or parent-in-law. More than half of women have high education (56%) and more than three-quarters of women are working (78%) and have high income (82%). More than 90% of women in the EMWS are currently married—which is not unexpected given that the survey was conducted among ever-married women in China. Given that this sample is limited to ever-married women, women who are not currently married are divorced or widowed. Population density, health infrastructure, and economic activity are treated as continuous measures (ranging from 0 to 10) with mean values for the three variables at 5.7, 5.4, and 4.7, respectively.

Random-Effect Models for Time Spent on Caregiving

Table 3.2 presents the random-effect regression models for women's time spent on caring for their parents and parents-in-law. All models control for the sociodemographic characteristics of women. Model 1 examines how caregiving resources, including education and income, affect caregiving time. Model 2 assesses whether having other social roles reduces the time that women have for taking on caregiving responsibilities. Model 3 investigates whether having caregiving risk factors, including co-residing with parents or parents-in-law and having at least one widowed parent or parents-in-law, increase the amount of time spent on caregiving. Model 4 includes community characteristics that include population density, health infrastructure, and economic activity. Model 5 includes all of the covariates.

Findings suggest that as women get older, they tend to spend more time on caregiving. Women in Inland and Mountain areas spend less time on care for parents/in-laws than those in Coastal areas. Women's time on caregiving in the Northeast is not significantly different from those in Coastal areas in the initial model. However, once social roles are controlled for in Model 2, the measure for Northeast becomes a strong predictor of the amount of time spent on caregiving. Women from Northeast areas spend significantly more time on caregiving than those living in the Coastal areas (Coefficient = .266; $p \leq .05$). The effect of being in the Northeast is even more pronounced in Model 3 once risk factors for caregiving are taken into account; and in Model 4 when community characteristics are included; as well as the fully adjusted model (Model 5). Urban women spend approximately half an hour more on caregiving than their rural counterparts (Models 1, 2, and 3). However, urban/rural residence becomes insignificant once community characteristics are taken into account in Model 4 and Model 5.

Model 1 suggests that women with higher levels of education spend more time on caregiving than those with lower levels of education. However, income does not significantly predict time on caregiving, net of the effects of education and sociodemographic variables. In the final model, however, the effect of education is no longer statistically significant. As expected, Model 2 shows that having other social roles significantly reduces the amount of time women spend on caring for their parents or parents-in-law. The results show that employment and child-rearing responsibilities take away from women's available time for fulfilling their filial obligations. Working women are much less likely to care for their parents/in-laws than non-working women. In addition, the greater the numbers of children who live with them in the same households, the lesser the amount of time women spend on caregiving. In the fully adjusted model (Model 5), the number of children in the household remains a strong predictor of caregiving time; however, the effect of employment is reduced to non-significance.

Model 3 suggests that living with their parents or parents-in-law and having at least one widowed parent or parent-in-law created substantially more care demands and put women at greater risk of having to take on more caregiving responsibilities. Even after the adjustments for all covariates in Model 5, both factors remain statistically significant (Coefficients = .788 and .307; $p \leq .001$, respectively). Model 4 indicates that women who live in areas with higher levels of population density, more health care resources, and higher levels of economic standing spend significantly more time on caregiving than their counterparts.

Random-Effect Models for Time Spent on Caregiving by Type of Care and Rural/Urban Residence

Table 3.3 presents the random-effect regression coefficients for predictors of women's time spent on caregiving. Results are presented separately by type of care and urban/rural residence because prior research and preliminary analyses indicated significant group differences. All models include measures for sociodemographic characteristics, caregiving resources, social roles, caregiving risk factors, and community characteristics. Age is consistently associated with the amount of time spent on caregiving. Living in the Northeast is a strong predictor of time spent on caregiving only among women in rural areas who care for their parents (Coef. = .420; $p \leq .001$). Living in Mountain regions is negatively associated with the amount of time spent of caregiving, although only among women caring for their parents and parents-in-law in urban areas (Coef. = -.399; $p \leq .05$ and -.562; $p \leq .01$, respectively).

Caregiving resources, measured by education and income, are not significantly related to time spent on caregiving. With regard to social roles, results suggest that working status is only associated with less time on care for parents-in-law in urban China (Coef. = -.365; $p \leq .01$).

A related factor that reduces women's caregiving provision is the number of children who live in the same household. Findings show that the number of children in the household is associated with less time spent on care for parents in urban areas (Coef. = -.216; $p \leq .01$) and for parents-in-law in rural areas (Coef. = -.085; $p \leq .01$). Yet, not surprisingly, the number of children living outside of the household does not affect the time spent on caregiving. Co-residing with parents is related to more time spent on parental caregiving and co-residing with parents-in-law is related to more time spent on care for in-laws. However, in both cases, the magnitudes of the coefficients are smaller in rural areas than in urban areas. Women with at least one widowed parent or parent-in-law spend significantly more time caring for their parents in urban areas, but not in rural areas or for their in-laws.

The role of community characteristics in predicting differences in the amount of time spent on caregiving is limited to rural areas. Results suggest that population density and economic activity are associated with significantly greater amounts of time spent on caregiving to parents in rural locations (Coef. = 0.063; $p \leq .01$ and 0.034; $p \leq .01$, respectively). Somewhat unexpectedly, health infrastructure is not significantly associated with time spent on caregiving, regardless of urban/rural residence and parental recipient of care.

3.8 DISCUSION

On average, women caregivers in this study report spending approximately 13 hours per week on care responsibilities. However, the demands of caregiving are substantially greater for women who care for both parents and parents-in-law. These dual providers spend upwards of 24 hours per week on caregiving activities, which is more than half of a full-time workload. I also find significant differences in caregiving time associated with sociodemographic characteristics (H1), co-residence and parental widowhood (H4), and community characteristics (H5). I find only limited evidence that women's social roles influence caregiving time (H3) and socioeconomic resource are not predictive of levels of caregiving involvement (H2). Next, I discuss the implications of these findings.

This is the first study to use population-based data to examine complex patterns of caregiving across the wide social and cultural landscape of China. The regional differentials in time spent on caregiving are striking and presumably a consequence of the unbalanced investments in policy and resources by Chinese government in a rapidly changing society. I find that women in Inland and Mountain areas spend significantly less time on care for their parents/in-laws than women in Coastal areas. Inland and Mountain areas have higher demands for old-age support, indicated by higher dependency ratios and less economic resources as measured by per capita GDP and old-age security (See Table 2.2). These findings suggest that women from advantaged regions are more able/available to provide care to their aging parents/in-laws than their counterparts from less-advantaged regions. An alternative explanation is that more educated women have fewer siblings, and therefore, fewer siblings to share caregiving responsibilities. However, I am unable to assess the validity of this explanation due to a lack of information on siblings in the EMWS.

A similar pattern is revealed in the findings for community characteristics. Women who live in areas with higher levels of population density, more health care resources, and higher levels of economic standing spend significantly more time on caregiving than their counterparts in communities with fewer resources. This suggests that filial norms remain deeply rooted in Chinese society and that women living in areas with abundant economic and health-care resources do not “buy out” of their caregiving responsibilities. Policymakers are encouraged to pay particular attention to the negative consequences of regional disparities in old-age support. Specifically, more government and community investments are needed to ensure that elders living in less-developed areas have access to care in the absence of adult children who frequently migrate for work.

The finding that women from Northeastern areas spend significantly more time on caregiving than those living in the Coastal areas is interesting. Both regions are comparable in terms of economic development and old-age demands, and yet, the amount of time devoted to caregiving differs significantly. In particular, intriguing patterns emerged in the stratified analyses for urban-rural residence and type of parental care. Living in the Northeast is a strong predictor of time spent on caregiving only among women in rural areas who care for their parents. Explanations for this finding are not straightforward given the limited literature on regional differences in caregiving patterns, and the possible role of family values, in China. However, anecdotal evidence suggests that persons from the Northeastern are known to be forthcoming, courageous, innovative, non-obedient, and enduring (Han 2005). Indeed, my finding provides some evidence to suggest that rural Northeastern women are somewhat distinct in that they provide significantly more care to their own parents.

Results of this study also suggest that women spend more time on caregiving as they age. This finding is not unexpected given that health status of parents/in-laws inevitably declines over time, and consequently, the need for care increases. Contrary to expectations, however, I find that socioeconomic resources (i.e., education and income) are not significantly related to time spent on caregiving. I suspect that the non-significance of education and income reflect the pervasiveness of caregiving in China that reaches across all levels of SES. That is, women of high SES and low SES are equally invested in providing care to their parents and parents-in-law.

The constellation of social roles plays an important role in determining women's caregiving behaviors. As hypothesized, having multiple social roles inherently limits women's ability and availability to spend time on caregiving. As such, child-rearing responsibilities significantly reduce women's time spent on parental care. As the number of children who live with women increases, the amount of time spent on caregiving decreases. Another explanation is that this finding reflects a life course (i.e., aging) effect. That is, child-rearing and parental caregiving responsibilities rarely overlap because the former is more likely to occur among younger women and the latter is more likely to occur among older women.

Caregiving risks have expectedly strong influences on caregiving time among young-adult and middle-aged women in China. Living with parents or parents-in-law and having at least one widowed parent/in-law exposes women to substantially more demands for care, and thus, puts women at greater risk of devoting more time to caregiving responsibilities. This suggests that women's caregiving behaviors are largely driven by and highly responsive (and adaptive) to the needs of their aging parents/in-laws. As a corollary of linked lives, the evidence also supports the perspective of altruism, which argues that caregiving behaviors are motivated by their aging parents' welfare, interests, and physical needs (Becker, 1974). As such, altruism is presumably greater among those with linked lives.

As the economy grows and cultural norms become more westernized in China, a new generation of women—many of whom are children of the one-child policy—is becoming increasingly independent. According to a recent survey of young professionals, approximately 75% of Chinese women consider themselves to be personally ambitious;

compared to only 50% of their U.S. counterparts (Hewlett and Rashid 2011). Economic independence and career success give women in China the confidence and authority that their mothers and mothers-in-law never had. In traditional Chinese society, the time and labor of daughters-in-law were considered a primary asset of their husbands' family. Therefore, women assumed the filial obligations of their husbands by caring for their parents-in-law. Consequently, these women could rarely achieve their own independence or provide care for their own parents.

However, my findings provide some evidence that Chinese women are redefining traditional filial obligations and family relations. My expectation of differential patterns of caregiving for parents and parents-in-law was supported (H6) in at least two ways. First, the significant effect of employment is only observed among urban daughters-in-law; suggesting that working status lowers their exposure to caregiving risks. Well-educated women are presumably under tremendous pressure to devote the majority of their time to work and are thus unavailable for caregiving tasks. Specifically, women working in urban areas face time constraints that may prevent them (in reality or as justification) from fulfilling their filial care obligations as daughters-in-law. Second, the effect of widowhood on caregiving time only remains statistically significant among urban daughters. This finding suggests that urban daughters may be particularly exposed or attuned to the needs of their parents. Both findings reflect a cultural shift away from patriarchal, patrilocal, and patrilineal traditions in contemporary Chinese society. Moreover, these patterns are only observed in urban China where economic changes are more pronounced and attitudes and beliefs are more open and increasingly westernized. However, I am unable to directly test these explanations due to the lack of data on attitudinal measures. I encourage future research to examine how changes in women's filial attitudes may be influencing caregiving behaviors over time.

In conclusion, the current study focuses on a sizeable group of young-adult and middle-aged women who are reshaping and pioneering the norms of old-age support by increasingly providing care to their parents. In the process, these women are redefining caregiving roles in a rapidly developing society. As China continues to modernize and westernize, Chinese daughters will be increasingly essential in its old-age support system. It remains to be seen whether daughters or daughters-in-law will be the predominant providers of care in the years to come in China.

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Table 3.1 Descriptive Statistics for Selected Dependent and Independent Variables (N=19,898)

	Mean	SD
Caregiving time	0.955	5.785
Caregiving time for caregivers (n=1,510)	12.584	17.169
Caregiving time for parents (n=858)	11.409	14.143
Caregiving time for in-laws (n=820)	11.415	13.950
Caregiving time for both parents/in-laws (n=168)	23.518	31.569
Sociodemographic Characteristics		
Age	37.903	8.403
Northeast (vs. Coastal)	0.191	0.393
Inland (vs. Coastal)	0.350	0.477
Mountain (vs. Coastal)	0.231	0.422
Urban (vs. rural)	0.290	0.454
Socioeconomic Resources		
Education (vs. primary school or less)	0.562	0.496
Family Income (vs. lowest quintile)	0.821	0.383
Social Roles		
Married status (vs. not married)	0.938	0.241
Working (vs. not working)	0.784	0.412
Number of children in household	0.910	0.994
Number of children outside household	0.286	0.682
Caregiving Risks		
Co-residing with parents/in-laws (vs. not)	0.269	0.443
Having widowed parents/in-laws (vs. none)	0.484	0.500
Community Characteristics		
Population density (vs. low)	5.678	1.510
Health infrastructure (vs. low)	5.428	2.288
Economic activity (vs. low)	4.654	3.223

Table 3.2 Random-Effect Regression Models for Time Spent on Parental Caregiving in China(N=19,898)

	Model 1	Model 2	Model 3	Model 4	Model 5
Sociodemographic Characteristics					
Age	0.021*** (0.005)	0.027*** (0.005)	0.040*** (0.005)	0.021*** (0.005)	0.031*** (0.006)
Northeast (vs. Coastal)	0.140* (0.136)	0.266** (0.135)	0.422** (0.136)	0.395** (0.138)	0.393** (0.140)
Inland (vs. Coastal)	-0.365** (0.119)	-0.276* (0.119)	-0.262* (0.118)	-0.205 (0.120)	-0.206 (0.120)
Mountain (vs. Coastal)	-0.640*** (0.130)	-0.501*** (0.130)	-0.609*** (0.129)	-0.487*** (0.130)	-0.521*** (0.131)
Urban (vs. rural)	0.518*** (0.100)	0.496*** (0.097)	0.557*** (0.096)	0.086 (0.116)	0.141 (0.117)
Socioeconomic Resources					
Education (vs. primary school or less)	0.296** (0.095)				0.119 (0.098)
Family Income (vs. lowest quintile)	-0.024 (0.111)				-0.142 (0.113)
Social Roles					
Married status (vs. not married)		0.473** (0.176)			0.207 (0.181)
Working (vs. not working)		-0.314** (0.102)			-0.164 (0.104)
No. of children in household		-0.219*** (0.042)			-0.152*** (0.044)
No. of children outside household		-0.106 (0.065)			-0.088 (0.066)
Caregiving Risks					
Co-residing with parents/in-laws			0.869*** (0.103)		0.788*** (0.104)
Having widowed parents/in-laws			0.266** (0.085)		0.307*** (0.086)

(Continued on next page)

Table 3.2 (Cont.)

	Model 1	Model 2	Model 3	Model 4	Model 5
Community Characteristics					
Population density (vs. low)				0.068*	0.066*
				(0.031)	(0.032)
Health infrastructure (vs. low)				0.036	0.034
				(0.020)	(0.020)
Economic activity (vs. low)				0.067***	0.039*
				(0.017)	(0.018)
Constant	-0.118	-0.013	-0.909***	-0.796**	-1.349***
	(0.243)	(0.275)	(0.234)	(0.288)	(0.357)
BIC	126222.0	126237.0	126172.9	126199.0	126178.5
Wald Chi-Square	173.440	158.200	203.160	196.890	316.310
Rho	0.048	0.049	0.047	0.048	0.043
Degrees of freedom	12	12	10	12	22

Note: standard errors in parentheses.
*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$, two-tailed test

Table 3.3 Random-Effect Regression Models for Time Spent on Caregiving for Parents and Parents-in-Law in Urban and Rural China (N=19,898)

	Caregiving for Parents		Caregiving for In-laws	
	Urban (n=5,771)	Rural (n=14,127)	Urban (n=5,771)	Rural (n=14,127)
Sociodemographic Characteristics				
Age	0.023* (0.009)	0.009* (0.004)	0.024** (0.008)	0.017*** (0.004)
Northeast (vs. Coastal)	0.201 (0.221)	0.420*** (0.090)	0.100 (0.201)	0.104 (0.096)
Inland (vs. Coastal)	0.005 (0.185)	-0.050 (0.077)	-0.155 (0.168)	-0.135 (0.083)
Mountain (vs. Coastal)	-0.399* (0.199)	-0.098 (0.085)	-0.562** (0.181)	-0.173 (0.091)
Socioeconomic Resources				
Education (vs. primary school or less)	0.062 (0.170)	0.082 (0.061)	0.028 (0.156)	0.100 (0.065)
Family Income (vs. lowest quintile)	0.093 (0.210)	-0.016 (0.071)	-0.038 (0.192)	-0.083 (0.072)
Social Roles				
Married status (vs. not married)	0.118 (0.237)	0.117 (0.129)	0.223 (0.222)	0.133 (0.133)
Working (vs. not working)	-0.061 (0.145)	-0.027 (0.074)	-0.365*** (0.133)	0.006 (0.075)
Number of children in household	-0.216** (0.083)	-0.044 (0.028)	-0.044 (0.076)	-0.085** (0.029)
Number of children outside household	-0.106 (0.130)	-0.054 (0.041)	-0.043 (0.119)	-0.006 (0.042)
Caregiving Risks				
Co-residing with parents (vs. not)	1.558*** (0.276)	0.60*** (0.169)	-0.101 (0.252)	-0.164 (0.175)
Co-residing with parents-in-law (vs. not)	-0.050 (0.168)	-0.025 (0.071)	1.139*** (0.154)	0.645*** (0.074)
Having widowed parents/in-laws (vs. none)	0.346** (0.129)	0.103 (0.057)	0.082 (0.119)	0.114# (0.059)

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Table 3.3 (Cont.)

	Caregiving for Parents		Caregiving for In-laws	
	Urban (n=5,771)	Rural (n=14,127)	Urban (n=5,771)	Rural (n=14,127)
Community Characteristics				
Population density (vs. low)	0.060	0.063**	0.042	-0.009
	(0.047)	(0.021)	(0.043)	(0.022)
Health infrastructure (vs. low)	0.041	0.001	0.055	0.010
	(0.037)	(0.013)	(0.034)	(0.013)
Economic activity (vs. low)	0.046	0.034**	0.003	0.022
	(0.029)	(0.012)	(0.027)	(0.012)
Constant	-1.428*	-0.700**	-1.132*	-0.545*
	(0.591)	(0.240)	(0.542)	(0.250)
BIC	34163.5	73804.1	33171.8	74067.9
Wald Chi-Square	93.680	162.990	108.010	150.970
Rho	0.086	0.002	0.076	0.042
Degrees of freedom	21	21	21	21

Note: standard errors in parentheses.
*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$, two-tailed test

CHAPTER 4

CAREGIVING AND HEALTH TRAJECTORIES OF WOMEN IN CHINA

4.1 INTRODUCTION

Family caregiving is a central feature of the aging process. Family caregivers play the principal role in allowing older adults to achieve aging with dignity and ‘‘aging in place,’’ by allowing individuals to grow old in their homes among family and with accommodations that compensate for their disease status, functional limitations, and disabilities (Pynoos 1993). Despite the benefits of receiving familial care for those in need, the altruistic (or self-serving) deeds of family members who provide care are not without consequences.

It is well established that the psychological health of those who provide care can be compromised: caregivers consistently report higher levels of stress, strain, and depression and lower levels of subjective well-being and quality of life than non-caregivers (e.g., Schulz, Visintainer, and Williamson 1990; Schulz et al. 1995; Pinquart and Sorensen 2003). Despite an abundance of research on psychological outcomes, the evidence is limited and often inconclusive with regard to the association between caregiving and physical health. Some studies indicate that caregivers have worse self-rated health, elevated blood pressure, and higher rates of coronary heart disease than those who are not caregivers (Lee et al. 2003; King, Oka, and Young 1992; Vitaliano, Zhang, and Scanlan 2003). Yet, other studies suggest that the effect of caregiving on physical health is not straightforward (Fredman et al.

2008). For example, research shows that older caregivers (aged 70 to 79) who provide high-intensity care (i.e., more than 24 hours per week) had elevated rates of mobility decline when adjusted for their levels of physical activity (i.e., daily routine, exercise, and caregiving activity); however, this association reversed when activity levels were not taken into account (Fredman et al. 2008). Similarly, in a study of caregivers for patients with osteoporotic fractures, Fredman and colleagues (2009) find that the physical functioning of high-intensity caregivers declined at a faster rate over two years than non-caregivers; and yet, high-intensity caregivers had higher levels of physical performance at baseline and follow-up than non-caregivers and low-intensity caregivers.

Caregiving cuts both ways for those who provide care. On one hand, caring for aging parents can provide individuals with a sense of purpose and meaning in life (Chen and Silverstein 2000; Marks, Lambert, and Choi 2002). It also provides an opportunity for adult children to closely and intimately interact with their parents for extended periods, which may strengthen intergenerational bonds (Tarlow et al. 2004). On the other hand, caregivers shoulder an enormous burden when providing intensive care to disabled, ill, or dying family members. As a result, caregivers' physical and mental health may be negatively impacted as they struggle to meet demands and fulfill caregiving roles. Moreover, balancing the challenging obligations of caring for family with other aspects of their lives—such as their employment, marriage, leisure-time, or community involvement—may be additionally detrimental to their well-being (see Schulz and Sherwood 2008).

The costs and rewards of caregiving often act as countervailing forces that make it difficult for researchers to sort out empirically the overall pattern of how caregiving affects health. Much of our current knowledge on parental caregiving is based on literature in Western societies and most studies are based on small samples, caregivers of certain characteristics (e.g., caregivers for dementia patients and those with mental illness), cross-sectional designs, and/or short-term follow-ups (See review by Walker, Pratt, and Eddy 1995; Vitaliano, Young, and Zhang 2004). Although informative, small and restrictive samples limit generalizability of the findings and cross-sectional studies are inadequate for determining causality.

Recent studies utilizing longitudinal data have advanced our understanding about the dynamic of the association between transitions to caregiving and health over time (e.g., Townsend et al. 1989; Turner, Killian, and Cain 2004; Marks et al. 2002; Choi and Marks 2006; Marks, Lambert, Jun, and Song 2008). However, the relationship between caregiving transitions and health is not conclusive. For example, some studies find an increase in depressive symptoms upon entering the caregiving role (e.g., Marks et al. 2002). Others, however, find evidence of adult children's adaptation to caregiving and an improvement in mental health or no change in their quality of life (e.g., Townsend et al. 1989; Lawton et al., 2000). Despite the longitudinal design of these studies, they are limited in their ability to capture the dynamics of long-term trajectories of caregiving and health because they rely almost exclusively on data from only two time-points. An exception is a recent study by Bookwala (2009), who examined a probability-based sample of caregivers across three waves of data and found that experienced parental caregivers had lower levels of marital quality than recent caregivers. However, it remains unknown whether these findings translate to health differentials.

Similar to the United States and most western nations, China is facing new and difficult challenges from population aging. However, China is different from most developed nations because strong filial norms prevail, family care is highly desirable for older adults, and institutional care remains highly stigmatized (Gu, Dupre, and Liu 2007). In addition, due to the lack of a national social security system, Chinese adults have the responsibility of providing the major source of care and support for their aging parents. On one hand, the societal burden of caregiving may be enormous as the proportion of adults aged 60 and older will be 30 percent of the population in 2050 (United Nations 2006). On the other hand, in the context of industrialization, westernization, and weakening traditional family values (Wang 2004), it remains to be seen whether family care is still viable and whether caregiving has major health implications for Chinese women. Despite abundant literature on the predictors of health among Chinese elders (e.g., Liang et al. 2000; Zimmer and Kwong 2004; Zeng, Gu, and Land 2007; Chen and Short 2008; Chen, Yang, and Liu 2010), the impact of parental caregiving on caregivers' health remains largely overlooked.

The current study follows a population-based cohort of women in China aged 18 to 52 over the span of 15 years. This study design is advantageous because it provides repeated observations of caregivers, non-caregivers, and those who transition in/out of caregiving in the context of changing family characteristics, socioeconomic resources, health behaviors, and health outcomes. The unique cultural, economic, and socio-political context of China provides an ideal setting to investigate the role of parental care in a family-oriented society. It also extends previous research from Western nations and provides external validity of the patterns and health consequences of caregiving in a developing nation.

The overarching goal of this research is to provide a sophisticated and uniquely detailed examination of caregiving and its correlated risks that contribute to adult health disparities in China over an extended period of the life course. To my knowledge, this study will be the first to utilize large-scale longitudinal data and advanced statistical methods to test the causal association between caregiving and health in China. In doing so, I will contribute new insights to our understanding of caregiving dynamics and their consequences by providing new and robust evidence on whether and to what extent caregiving impacts women's health trajectories in a family-care centered society.

4.2 LITERATURE REVIEW

Health Implications of Caregiving

Over the last several decades, one of the most researched topics on informal caregiving has been the physical and psychological consequences of caregiving (e.g., Choi and Marks 2006; Kramer and Lambert1999; Lawton et al. 2000; Snyder 2002). In general, caregiving is considered a chronic stressor whereby caregivers face physical and mental challenges by providing care to frail, disabled, and mentally impaired persons. In many ways, caregiving is a taxing responsibility that requires tremendous amounts of emotional, financial, and cognitive resources (Feeney and Collins 2003). As such, research consistently shows that adults who provide care exhibit greater levels of burden, anxiety, depression, and poor self-rated health than adults who are not caregivers (Perlick et al. 2005; Marks 1996; Vitaliano, Zhang, and Scanlan 2003). The effect of caregiving on health can be "direct" because caregiving is tedious in nature and can be both physically and mentally demanding. Caregivers often provide assistance in activities of daily living (ADL) such as bathing, clothing, and feeding and instrumental activities of daily living daily (IADL) such as money management and transportation. Accordingly, Pearlin and colleagues' (1990) influential work suggests that ADL and IADL responsibilities are among the most prevalent and stressful experiences of caregiving.

The effect of caregiving on health also can be "indirect." For example, studies have consistently shown that caregiving is associated with the lack of time for other family members, lower marital quality, and decreased involvement in social activities (e.g., Marks, 1996; Marks et al. 2002; Bookwala 2009). In addition, caregivers often experience financial burdens as a result of becoming a caregiver (Cantor 1983; Hoffman and Mendez-Luck 2011). Because caregivers often devote significant attention to their care recipients and invest a sizeable proportion of their time to care, caregivers may have to quit their jobs (or take part-time jobs) that may induce financial strain. Caregiving also may require using personal finances toward providing food, clothing, transportation, housing, and utility fees for their care recipients (Clark 1994). In sum, the consequences of forfeited resources, acquired strains, and economic burdens may indirectly lead to declining health among caregivers.

In addition to direct and indirect effects, the association between caregiving and health may be further confounded with selection effects. In brief, the healthy caregiver hypothesis suggests that individuals who are healthier and more capable of providing care are more likely to take on caregiving responsibilities (McCann et al. 2004; Fredman et al. 2009). This argument is compatible with the more general selection perspective that individuals are selected into roles such as caregiving—much like higher education, employment, and marriage—because they are physically competent to perform both physically and psychological demanding tasks of providing care to older adults. However, because longitudinal analyses of caregiving remain scarce, many studies are unable to disentangle between whether caregiving leads to poor health or whether caregivers are simply less healthy to begin with (see Marks 1998). Indeed, Vitaliano and colleagues (2004) underscore the need for prospective studies to "examine a cohort before caregiving and before a target illness develops" so that researchers can effectively examine "how changes in caregiver status and illness relate to psychosocial, behavioral, and physiological changes" (Vitaliano, Young, and Zhang 2004: p15).

Theories of Caregiving Predicting Health

Role Strain Theory and Role Enhancement Theory

Two commonly identified and analogous theories on the association between informal caregiving and health are role strain theory and role enhancement theory. In contemporary society, individuals often occupy multiple roles at the same time and juggle responsibilities related to these different roles. For example, women frequently and simultaneously occupy the role of mother, sister, employee, wife, and caregiver. Proposed and developed by Goode (1960), role strain theory (also referred to as the "scarcity approach") states that multiple roles can be problematic and may lead to undo stain because of the various demanding (and sometimes conflicting) obligations, duties, and responsibilities. In the framework of role strain theory, caregiving is conceptualized as a family role which is likely to be in conflict with other social roles that individuals occupy. The theory has received some empirical support in the literature. For instance, the term "sandwich generation" is a characterization of role strain that is often used to describe caregivers who juggle multiple social roles that negatively impact their well-being (Brody 1981; Grundy and Henretta 2006). Similarly, research shows that conflicts with work can be extremely difficult to manage for caregivers who experience pressures from both caregiving and work roles (Mui 1992).

Proposed by Sieber (1974), role enhancement theory (also referred to as the "identity accumulation hypothesis") alternatively states that multiple roles are beneficial to well-being because they promote a sense of mastery, identity, and self-esteem (Marks 1977). In the framework of role enhancement theory, caregiving is conceptualized as a family role that enhances one's well-being by adding to the (valued) number of social roles. Accordingly, studies suggest that the number of social roles is positively associated with well-being and taking on the additional role of caregiver is beneficial to health (Rozario, Morrow-Howell, and Hinterlong 2004; Thoits 1983, 1986). Similarly, Stoller and Pugliesi (1989) find that multiple roles can broaden caregivers' social networks and, thus, lead to better health, lower psychological stress, higher self-esteem and greater well-being.

Wear-and-Tear and Adaptation Hypotheses

Similar to role strain and role enhancement theories, wear-and-tear and adaptation models of caregiving are another two opposing perspectives predicting the health consequences of caregiving. However, a distinctive feature of these latter hypotheses is their special emphasis on time. The wear-and-tear hypothesis suggests that as the demands of caregiving accumulate, its negative health consequences deteriorate over time (Townsend et al. 1989). Conversely, adaptation hypothesis indicates that caregivers' health are damaged most during the early periods of caregiving (i.e., status transition) but then level-off over time as they adjust to the physical and mental challenges of caregiving and settle into their role (Lawton et al. 2000). Both wear-and-tear and adaptation hypotheses predict lower levels of health among caregivers than non-caregivers. However, these two perspectives differ in the long-term patterns of health changes over time: (i) wear-and-tear predicts an accelerated and steady decline in health over time and (ii) adaptation hypothesis predicts an abrupt decline in health followed by a gradual improvement over time (Lawton et al. 2000). Figures 4.1A and 4.1B illustrates each of the theoretical perspectives of how caregiving may influence health as outlined above.

Although many of these theories (e.g., role strain) are informative, they are limited in capturing the dynamic associations between caregiving contexts and health trajectories over time. I next discuss how the life course perspective provides an overarching framework that integrates these major theories for understanding the immediate and long-term consequences of caregiving for women's health.

Life Course Theory

Life course theory provides a framework for understanding how the association between caregiving and health develops across adulthood. The reasons some individuals care for their parents and some do not are complex and evolve over the life course. Some women voluntarily engage in caregiving roles out of a sense of altruism. However, others may be forced into their caregiving obligations due to social pressures and/or the lack of alternative options (e.g., siblings who are unavailable or unwilling, or an inability to pay for professional care). Therefore, the health implications of caregiving vary across individuals and across time.

From a life course standpoint, an individual's health status and change in health is viewed as the accumulation and culmination of one's life events and experiences. Indeed, this emphasis on time is compatible with the wear and tear and adaptation hypotheses that provide alternative predictions of how the association between caregiving and health unfolds over the life course. Whether and to what extent an adult's health is influenced by providing care is largely contingent upon their life experiences and relationships, particularly with their parents. For example, a caregiver may interpret her caregiving activities as an opportunity to repay her parents' early nurturing and/or assistance in childcare during later years. Thus, caregiving may have a positive impact on health, as previously shown (Stoller and Pugliesi 1989). On the other hand, caregiving may be interpreted and internalized as a losing proposition if the child-parent relationship is strained (i.e., difficult upbringing and/or not receiving childcare or financial assistance during later years). Caregiving can thus have a detrimental effect on the emotional and physical well-being of the provider. These arguments are consistent with role strain/role enhancement hypotheses discussed earlier.

The majority of evidence suggests that transitions to caregiving and caregiving intensity are negatively related to self-rated health over time (e.g., Choi and Marks 2006; Lawton et al. 2000). In a life course framework, it is argued that transitions to caregiving and intensity of caregiving can be both acute and chronic stressors that can manifest in health outcomes that are immediate and/or long-term. Empirically, this suggests that the acute and chronic consequences of caregiving transitions and intensity may impact both the intercept and slope of health, respectively. The current research will address how changes in caregiving status and intensity impact trajectories of health in adult children who provide care to aging parents in China. The following section discusses the conceptual framework for how different caregiving factors may influence initial levels of self-rated health and changes in health across age.

Caregiving Trajectories

Guided by life course theory, this dissertation views caregiving trajectories as the conceptual aggregation of the timing and duration of caregiving status(es) that unfold over time. Caregiving marks an important turning point in the life course when children assume the role of care and principal provider for their aging parents. Caregivers can experience a series of phases in this role, including a learning phase as a newcomer (Jeon and Madjar 1998), an adjustment phase to develop skills and expertise (Taraborrelli1994), a phase of confronting change, managing uncertainty, and developing a sense of control (Skaff, Pearlin, and Mullan 1996), a phase of providing intensive care as a seasoned and effective caregiver, and a grieving phase that accompanies end-of-life care (Robles-Silva 2008).

The health trajectories of caregivers may be affected in a variety of ways according to the different phases of caregiving and when they occur in a caregiver's life. For example, some researchers have noted that the first year of caregiving can be particularly difficult, with fluctuations in social support that can have detrimental effects on caregivers' distress and physical health (Shewchuk, Richards, and Elliott 1998). However, others have suggested that the negative effects of caregiving on health may not manifest in the early stages of caregiving (e.g., Hirst 2005). Some subgroups of the population also may be better at handling certain phases of caregiving than other subgroups. For instance, persons with more economic resources and/or family support may make a less stressful transition to caregiving than those with fewer economic resources by enrolling in training and educational programs that better prepare adults for the transition to and intensity of caregiving. Considering these dynamics, it is important to examine the complex interplay between various caregiving dimensions and health trajectories over extended periods.

A review of the existing literature on caregiving dynamics and health yield a collection of studies focusing on a single caregiving dimension—predominately caregiving status—with relatively few that include multiple measures (e.g., caregiving status and intensity). To address this gap in our understanding, I examine several interrelated yet distinct components of caregiving, including caregiving (i) status, (ii) timing, and (iii) intensity.

Caregiving Status

Caregiving status simply categorizes individuals into those who provide care and those who do not. Perhaps the most researched feature of caregiving is current status. To date, the overwhelming emphasis in the literature is how caregivers are different from non-caregivers in psychological, physical, and even clinical outcomes. Individuals who are caregivers often occupy multiple roles at the same time and juggle responsibilities associated with different social positions. As previously indicated, women typically fulfill the roles of mother, sister, employee, spouse, and caregiver at some point in their life course, often concurrently. Role strain theory (a.k.a. the scarcity perspective) states that negotiating multiple roles can be challenging and may ultimately induce stress in response to various (and at times competing) demands, obligations, duties, and responsibilities. Indeed, Pearlin (1989) emphasized role strain as a major life stressor and urged sociologists to "focus their attention on problems that arise within the boundaries of major social roles and role sets (p.245)."

Not surprisingly, most studies show that being a caregiver is linked to increased levels of emotional burden, distress, depression, reduced quality of life, and worse physical health (e.g., Marks 1996; Montgomery, Gonyea, and Hooyman 1985; Turner et al. 2004). In addition, there is another less-recognized status that may have implications for health. Non-caregivers include (i) adults with parents who do not require care and (ii) adults with parents who require care but are unwilling to provide care or are alleviated from these responsibilities due to the availability of alternative care (e.g., institutional care or care by other siblings). Indeed, recent research suggests that the latter and distinct class of non-caregivers (group ii) report lower well-being than non-caregivers without parents in need (Amirkhanyan and Wolf 2006). In a family-centered society where filial norms prevail, the social pressures of providing adequate care to aging parents can be overwhelming for Chinese adult children. *Xiao*, or filial piety (a major component of Confucius thought), emphasizes obedience, respect, emotional support, and physical care to the elderly and is highly valued in Chinese society (Zhan and Montgomery 2003). In fact, in 1996, a law was implemented to ensure the economic and social rights of the aged (中华人民共和国老年人权益保障法) and emphasized the role of adult children in providing physical care and financial assistance to the elderly. Therefore, when adult children are unable to fulfill their filial obligations of providing parental care when needed, emotional strain or guilt may emerge and ultimately translate into compromised physical health (See Schulz et al. 1995; Vitaliano, et al. 2003).

Although informative, caregiving status—whether caregiver or non-caregiver—portrays only a limited picture of one's caregiving history and experiences over the life course. Moreover, caregiving status does not differentiate levels of exposure to the status, the timing of the transition(s), or the intensity of caregiving required. For many caregivers, providing care can be a lifetime commitment. Studies show that four out of 10 caregivers spend five or more years in the caregiving role and two out of 10 spent at least a decade providing care to their family members (Reinhard 2004). Therefore, it is important to look beyond a static snapshot of caregiving status and its association with health and recognize how changes in caregiving status impact changes in health trajectories over time.

Caregiving Timing

The timing of role entry refers to the "sequencing and synchronization of major life role transitions such as marriage and parenthood" (Burton and 1993:p.49; also see review by Hagestad 1990). In this respect, caregiving is compatible with entry into marriage, work, and parenthood because it marks a distinct transition into a social role with important implications related to its timing in the life course.

The timing of role entry is often governed by social timetables that reflect "age norms and age expectations" of the time when certain life events or transitions are expected to occur (Burton 1996: p.199). In essence, these timetables outline the most accepted and supported times to enter (or exit) social roles over an individual's life course. Not surprisingly, timetables can vary greatly according to cultural norms and across social contexts. For example, it is appropriate for an 18 year old to marry in the United States, and yet, the legally eligible ages to marry in China are 22 years for men and 20 years for women. When individuals abide by socially desired timetables, they adhere to what are referred to as normative or "on-time" transitions to new roles (Burton 1996). Alternatively, deviations from these implicit (or explicit) timetables are considered off-time transitions that can include the "early non-normative" and "late non-normative" timing of social roles.

Caregiving timing is the age at which a person makes a transition to caregiver and describes whether the transition to caregiving occurs within the socially and culturally expected (approved) age range. Entering the role of caregiver at a non-normative time can disrupt individuals' normal sequencing of life events and social roles. For example, becoming a caregiver during young adulthood (i.e., early timing) may prevent individuals from developing intimate relationships (Burton and Sorensen 1993), achieving higher levels of education, and establishing careers and maintaining stable work. In other words, caregivers at young ages are faced with having to devote extensive resources at periods in the life course when investments should be made in one's education, work, and family. Considering these factors, and the costs of forfeiting important social resources, it is argued that that the timing of caregiving also may have significant implications for health.

Although timing is an important concept in life course theory and its discourse (Elder 1985; George 1993; Giele and Elder 1998), surprisingly few studies have examined the health influences of the timing of role entry. The limited research that exists focuses on the timing of marriage, and suggests that persons who marry early have greater levels of psychological distress (Forthofer et al. 1996), chronic illness (Dupre and Meadows 2007), and mortality (Dupre and Meadows 2007). It is anticipated that early entry into the role of caregiving may have similar implications for health. However, to the best of my knowledge, research has not directly examined the health consequences associated with the timing entry into the caregiving role.

Caregiving Intensity

Caregiving intensity refers to the time spent caregiving, the type of care provided, and the number of caregiving activities. Persons engaging in high-intensity care are those who provide more time on care, engage in more caregiving activities, and care for those with more debilitating conditions such as severe physical disability, mental illness (e.g., dementia), and end-of-life care.

The association between caregiving intensity and health is particularly susceptible to selection bias, even more so than the relationship between caregiving status and health. Individuals with poor health may still act as caregivers and provide modest levels of care; however, they are more likely to be unwilling or unable to perform high-intensity care (i.e., selected out). If caregivers who provide high-intensity care are indeed more healthy and/or capable than their counterparts, it is plausible that these caregivers are more resistant to the stress associated high-intensity care, and thus, may exhibit fewer physical health problems than others—at least in the short term. It is unclear, however, whether the detrimental toll of stress associated with high-intensity care would manifest into poor health over the long term.

Most research suggests that a high frequency of performing caregiving tasks is associated with high levels of stress and emotional burden, and even higher rates of mortality (Stoller and Pugliesi 1989; Dwyer, Lee, and Jankowski 1994; Christakis and Allison 2006), relative to a low frequency of caregiving. Similar patterns of caregiving intensity and health are found in Asian countries. For example, a study by Choi (1993) shows that hours of daily caregiving are an important determinant of caregiver burden in South Korea. Similarly, a cross-sectional study of 110 caregivers in China shows that the amount of time spent on caregiving was positively related to the likelihood of depression (Zhan 2006). In contrast, some studies suggest that high-intensity care may not lead to poor health outcomes. For example, in a recent longitudinal study of approximately 900 elderly women from the Caregivers-Study of Osteoporotic Fractures survey, Freidman and Colleagues (2009) demonstrate that caregivers who provided low-intensity care had greater declines in physical functioning than non-caregivers. Moreover, caregivers who engaged in high-intensity care demonstrated the highest levels of physical functioning at baseline and throughout subsequent follow-up periods.

Cultural Context of Caregiving in China

China is known as a family-care centered society. Traditionally, most Chinese elders received care from their family members, primarily from their adult children. Family care has remained the dominant type of care for older adults throughout Chinese history; whereas institutional care has remained highly stigmatized. From the standpoint of adult children, social pressures are strong to fulfill their filial obligations and avoid placing their elder parents in institutions. From the standpoint of aging parents, a combined sense of shame and fear of "loosing face" limits, and largely prevents, many elders from entering institutions. Consequently, the majority of elders who need care in China are cared for by family members and less than 5% are institutionalized (Liang and Gu 1989).

In the last few decades, the world witnessed China undergo one of the most dramatic societal changes in history, with rapid economic growth, reductions in poverty, and enhancements in its public health infrastructure that were arguably unmatched by societal standards. Unparalleled to its success in economic measures, the development of China's support system for its aging population is comparatively slow and becoming increasingly problematic. In the United States, the emotional and financial burden of caregiving among adult children is greatly alleviated by numerous government programs—such as Medicare, Medicaid, and Social Security—that help shelter many elderly Americans from the negative risks associated with old age. In comparison, on the other side of the globe, Chinese adult children find themselves facing difficult responsibilities in caring for their aging parents because of the lack of a national social security system that leaves many Chinese older adults vulnerable to unsheltered aging. Chinese adult children often become the most important, and sometimes the only, resort to providing the major source of care and support for older generations.

The demographic changes underway in China are astonishing: the proportion of adults aged 65 and older increased from 4.4% (26.2 million) in 1953 to 8.9% (about 118.7 million) in 2010 (Peng 2011). As a result of a reduced total fertility rate (5.8 in 1953 to 1.5 in 2010) and increased life expectancy (66 years for males and 69 years for females in 1982 to 72 years for males and 76 years for females in 2010) (Peng, 2011), the challenges of providing old-age care are unprecedented. Caring for rural older adults could be particularly problematic due to the lack of an established social security system and the limited number of institutional-care resources in rural areas, and an overall shortage of caregivers as a consequence of massive rural-urban migration in China (Shang, 2001; Wang, Gu, and Dupre, 2008). Concerns about family-centered support for the elderly in China are further amplified by recent evidence indicating that industrialization and westernization have weakened traditional values (Wang 2004).

Positioned in the center of massive social, structural, political, and cultural changes, Chinese women find themselves facing a difficult road ahead and key questions remain unanswered. Is family care sustainable in the context of such dramatic demographic change? And if so, do Chinese women have to sacrifice their health when shouldering the responsibility of caring for their aging parents with chronic and debilitating illnesses? China's unique societal structure and cultural norms make it an ideal setting to examine how women negotiate caregiving with their structural constraints and maintain their health in the process of fulfilling their caregiving responsibilities.

Hypotheses

This study is based on previous theoretical and empirical research suggesting that the association between caregiving and health is predominately causal rather than an artifact of selection. Given the limited number of studies on this topic, I propose three major hypotheses and offer alternative postulations based on established theory. The following hypotheses are proposed:

H1: Caregiving status will be associated with both initial health status and the rate of health decline over time among women.

H1a: Caregivers will have the lowest levels of initial health that will persist across time relative to non-caregivers.

H1b: Life course theory and the wear-and-tear hypothesis predict that caregivers will have initial and increasingly worse health over time relative to non-caregivers.

H1c: Life course theory and the adaptation hypothesis, however, predict that lower levels of health among caregivers relative to non-caregivers will diminish over time.

H1d: Non-caregivers with parents who require care will exhibit patterns of health similar to caregivers, although the magnitudes of associations are expected to be less because they are not directly exposed to the demands of caregiving.

H2: Life course theory predicts that caregiving timing will be associated with both initial health status and the rate of health decline over time among women.

H2a: Role strain theory predicts that early caregiving (i.e., entering the caregiving role at an early age) will be associated with initial and consistently lower health than late caregivers and non-caregivers.

H2b: Early caregivers, however, may exhibit improvements in health (i.e., slower rates of decline) relative to non-caregivers because of their younger age or role adaptation.

H2c: Late caregivers will exhibit increasingly poorer health than non-caregivers in a pattern consistent with a wear-and-tear process that is expected at older ages.

H3: Caregiving intensity will be associated to both initial health status and the rate of health decline over time among women.

H3a: High-intensity caregiving will be associated with initial and increasingly poor health over time according to life course theory and the wear-and-tear hypothesis.

H3b: According to life course theory and the adaptation perspective, however, the negative effects of high-intensity care will diminish over time.

4.3 DATA

I use longitudinal data from the China Health and Nutrition Survey (CHNS), an ongoing project conducted by the Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute of Nutrition and Food Safety at the Chinese Center for Disease Control and Prevention. Seven panels of data were collected in 1989, 1991, 1993, 1997, 2000, 2004, 2006, and 2009. Self-rated health was not collected in 1989 and 2009 and therefore excluded from the analyses. The CHNS was conducted in nine provinces across a wide geographic region with various levels of economic development, health status, and resources, including Guangxi, Guizhou, Heilongjiang Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong (Figure 4.2). A multistage, random cluster sampling strategy was used and income was used to stratify the counties within the provinces. I select a subsample of women aged 18 to 52 in the Ever Married Women Survey (EMWS) component of the CHNS who reported the time they spent on parental care and self-rated health.

The EMWS is well-suited for the objectives of this study. First and foremost, the longitudinal design of the EMWS allows me to observe respondents at multiple time points and will help to establish causal associations. Because these longitudinal data provide information on health status prior to and after transitions to caregiving, the causal ordering between health and caregiving can be adequately modeled to test my proposed hypotheses.

In addition, the long duration of EMWS data also captures the enormous societal, social, and cultural shifts in contemporary China and enables me to assess individual and aggregate changes in caregiving patterns and their determinants over time. In sum, this research takes full advantage of the multiple waves of data and will examine how the time-varying characteristics of caregiving and its social, behavioral, and contextual correlates impact health over 15 years.

Analyses are limited to young-adult and middle-aged women aged 18 to 52 who have ever been married in China. The analytic sample consists of 2,700 ever-married women in 1991, 2,568 in 1993, 2,855 in 1997, 2,784 in 2000, 3,109 in 2004, and 3,106 in 2006. There were 650 records dropped due to missing values on any of the study variables (less than 4%). Thus, the final sample consists of 6,178 women who contribute 17,122 person-years of observation.

4.4 MEASURES

Dependent Variable

Self-Rated Health

The following question was asked of each household member: "How would you describe your health compared to that of other people of your age?" Responses range from 1 to 4, indicating excellent, good, fair, and poor health, respectively. Those who "refuse to answer" and "do not know" were coded as missing and dropped from the analysis (n=301). I also reverse-coded the measure of self-rated health so that higher values indicated better health. The measure of self-rated health used for this analysis is widely recognized as a robust and global indicator of health and well-being in the literature (Farmer and Ferraro 1997; Johnson and Wolinsky 1993).

Independent Variables

Time-varying measures of caregiving status (i.e., transitions), timing, and intensity are examined as key independent variables predicting self-rated health.

Caregiving Status

All respondents were asked: "Does your mother need to be taken care of?" For persons who answer "yes," a follow-up question was asked: "During the past week, how much time did you spend taking care of your mother?" Similar questions were asked about respondents' care for their fathers, mothers-in-law, and fathers-in-law, respectively. Caregiving status is categorized as caregivers, non-caregivers without parents/in-laws in need, and non-caregivers who reported having parents or parents-in-law who need care but spent no time providing care.

Variables for "over-worked caregivers" and "conflicted caregivers" were also examined. Over-worked caregivers are those who provide care to both parents and parents-in-law at the same time. Conflicted caregivers are those who provide care only to parents or only to parents-in-law despite needs from both parental groups. Although potentially substantively meaningful, these two variables were ultimately dropped from the analyses because sample sizes were too small to detect effects on mean levels of health, as well as changes in health across time.

Caregiving Timing

Caregiving timing is the age at which a person becomes a caregiver. Guided by substantive and distributional considerations, women who became caregivers before the age of 35 (i.e., ages 18-34) are considered as "early caregivers" and those who became caregivers at age 35 or older are considered "late caregivers." Modifications of these age cut-points were assessed; however, they did not improve explanatory power.

Caregiving Intensity

I measure caregiving intensity by adding the amount of time spent taking care of mothers and fathers to ascertain the total time spent on caring for parents. Similarly, I added the amount of time spent taking care of mothers-in-law and fathers-in-law to compute the amount of time spent on caring for parents-in-law. I then summed the time spent on caring for parents and parents-in-law to compute the overall time spent on elder parental care. Based on distributional evidence and interpretive clarity, women who reported spending at least one hour per day on caregiving are categorized as providing "high-intensity" care (3%) and those who spend no more than one hour per day on caregiving are categorized as providing "low-intensity" care (4%). Alternative categorizations were assessed, however they did not substantively or empirically improve the results.

Control Variables

I adjust for four groups of independent variables to assess the factors potentially contributing to the associations between the indicators of caregiving and self-rated health. These measures include sociodemographic characteristics, socioeconomic status, family context, and health behaviors. The coding and measurement strategy listed below are guided by existing research and conventional assignments; however; extensive (re)coding and sensitivity analyses were used to determine the best fitting and most parsimonious measures for the current analysis and study population.

All multivariate models adjust for sociodemographic characteristics. I adjust for the age of women (in years) to account for differential "exposure" to caregiving for their elderly parents. I also include urban/rural residence (urban=1) in the analyses to capture the well-known and pronounced socio-cultural differences and living arrangements by region. I also adjust for differential levels of economic development across provinces to capture regional differences in the following areas: Northeast, Inland, Mountain, and Coastal (reference group) regions. Liaoning and Heilongjiang are grouped into the Northeast region; Jiangsu and Shandong are categorized in Coastal areas; Henan, Hubei, and Hunan are categorized in the Inland region; and Guangxi and Guizhou are categorized in the Mountain region (see Figure 4.2).

The second set of independent variables identifies levels of socioeconomic status. Educational attainment is categorized according to women with high school or above levels of education (coded 1) and those with a primary level of education or less; household per capita income is coded as 1 if individuals are not in the lowest quintile of the income distribution. Employment status is dichotomized as currently working (coded 1) and not currently working or retired (reference group).

The third group of independent variables captures family context, which is anticipated to alleviate or exacerbate the burden of caregiving on women's health. Family context is measured by marital status (coded 1 if currently married), number of children (continuous), and co-residence with parents (coded 1 if living in the same household or dwelling). The final category of independent variables takes into account the effects of health behaviors. The following measures are included, alcohol consumption (coded 1 if currently drinking), smoking status (coded 1 if currently smoking), and body mass index [(BMI), continuous].

4.5 ANALYTICAL STRATEGY

To execute the analyses, I constructed a person-year file from the EMWS data. The analytic sample includes 6,178 women who contribute 17,122 person-years of repeated observation (Table 4.1). The sample is comparable to the analysis of caregiving time with the exclusion of women interviewed at 2009 (n=2,486) and women with missing values on the dependent variable for self-reported health (n=301).

I use a series of growth curve models to account for intra-individual changes in parental care involvement to estimate intra-individual and inter-individual differences in trajectories of health. The multi-wave longitudinal data in the EMWS provide rich information that allows me to explore how individual factors, family contexts, and related processes and outcomes change over time. The growth curve approach is a powerful method to maximize panel data and has two major advantages for these analyses. First, it provides the ability to identify temporal patterns (i.e., variability) in the data: I account for whether current status, timing, and intensity of caring for aging parents increases over time as women become free of childrearing obligations and/or decreases at older ages due to their own worsening health. In other words, the analyses treat caregiving status, timing, and intensity as time-varying variables to examine whether and to what magnitude these factors influence changes in health. Second, the growth curve approach provides the ability to model and assess dynamic changes in health (via six time points) as they relate to time-varying changes in caregiving and other individual and family factors.

Preliminary analyses tested both age- and time-based growth curve models to predict changes in self-rated health. Results were generally consistent (in terms of point estimates) for both time metrics; however, analyses based on time were more robust and statistically significant than those obtained from the age-based analyses. It is possible that the sparseness of age-related data in the panel survey (i.e., approximately 34 years across ages 18 to 52) relative to time (i.e., 15 years across 1991 to 2006) provided less stable estimates. Therefore, I use growth curve analyses based on time to estimate the effects of caregiving factors and related covariates.

The EMWS panel data have two levels, with repeated measurements at Level 1 that are nested within individuals at Level 2. Accordingly, the models for involvement in parental care can be specified as the following:

Level-1 Model: $y_{ti} = \pi_{0i} + \pi_{1i}\, Time_{ti} + \pi_{2i}\, Time_{ti}^{\,2} + e_{ti}$ (1)

Level-2 Model: $\pi_{0i} = \beta_{00} + \gamma_{0i}$ (2)

$\pi_{1i} = \beta_{10} + \gamma_{1i}$

$\pi_{2i} = \beta_{20} + \gamma_{2i}$

Combined model:

$$y_{ti} = (\beta_{00} + \beta_{10}\,Time_{ti} + \beta_{20}\,Time_{ti}^{\ 2}) + (\gamma_{0i} + \gamma_{1i}\,Time_{ti} + \gamma_{20}\,Time_{ti}^{\ 2} + e_{ti}) \qquad (3)$$

The Level-1 model captures within-individual change of the outcome variable y_{ti} (self-reported health) over time. The dependent variable y_{ti} for person i at time t is modeled as a function of linear and quadratic terms of time for person i at time t. The random within-person error term, e_{ti} has a normal distribution. For person i, π_{0i} is the intercept or mean level of self-rated health. π_{1i} is the linear rate of change in self-reported health across time. Similarly, π_{2i} is the quadratic rate of change in self-reported health across time. e_{ti} is the residual error at Level-1. All control variables are time-varying covariates and entered in the Level-1 analyses (socio-demographics, SES, family context, and health behaviors).

In the Level-2 models, β_{00} is the mean intercept of the time trajectory, β_{10} is the mean linear component of the slope of the time trajectory and β_{20} is the mean quadratic component of the slope of the time trajectory. For person i, γ_{0i} is the random effect of the intercept term, γ_{1i} is the random effect of the linear component of the slope, and γ_{2i} is the random effect of the quadratic component of the slope. The combined model shows the observed repeated measures of self-rated health as an additive combination of a fixed and random and growth component. I conducted preliminary tests to determine whether the quadratic term is necessary or redundant. The above 3 equations apply to both the effects of caregiving status and intensity on self-rated health. However, the quadratic term is not necessary for the effects of caregiving timing on self-rated health. Therefore, the combined model for caregiving timing is listed below:

$$y_{ti} = (\beta_{00} + \beta_{10}\, Time_{ti} + \beta_{20}\, Time_{ti}^{\,2}) + (\gamma_{0i} + \gamma_{1i}\, Time_{ti} + e_{ti}) \quad (4)$$

Because there are multiple observations at various times t for each person i, I take into account the correlation among observations from each person and treat $\{y_{1i}, y_{2i}, ..., y_{Ti}\}$ as a cluster. As suggested in previous research (Chen, Yang, and Liu 2010), I use unstructured covariance matrices that assume no definite patterns in the dependent variable (see Figure 4.3).

4.6 RESULTS

Descriptive Statistics

Descriptive statistics for the key independent variables and dependent variable are presented in Table 4.1. Approximately 7% of the EMWS analytic sample report being caregivers (3.8% for parents and 3.6% for parents-in-law) and an additional 9% of women report having caregiving responsibilities that are not met (i.e., deserters). Overall, and as expected, the majority of women (93%) do not provide care to either their parents or parents-in-law. About 3% of women engage in high-intensity care (i.e., ≥ 1 hour of caregiving per day) and 4% of women engage in low-intensity care (i.e., < 1 hour of caregiving per day).

Five percent of the sample became caregivers before the age of 35 (i.e., ages 18-34: early caregivers) and 18% of the sample became caregivers at age 35 or older (late caregivers).

In terms of sociodemographics, the average age of women across repeated observations in the sample is 38 years, 19% live in the Northeast, 35% live in the Inland area, 23% live in Mountain regions, and 29% live in urban areas. In terms of SES and family context, 54% of women in the EMWS have more than a primary-level education, 80% are currently working, 93% are married, average one child, and 26% co-reside with their parents and/or parents-in-law. Distributions of health behaviors are generally favorable, less than 3% report smoking, 10% consume alcohol, and the average BMI is in the normal range, at 22.6. On average, women in the CHNS reported fair to good self-rated health (mean = 2.8). Figure 4.4A illustrates mean levels of self-rated health by year and caregiving status and Figure 4.4B illustrates mean levels of self-rated health by age and caregiving status. Figure 4.4A shows that caregivers and deserters consistently report lower levels of health than those without parents or parents-in-law who require care, with an exception in 1997 (year 7). In general, the disparity in health between caregiving statuses is generally large early, and then levels off over time, followed by an increase in later years—a pattern that is characteristic of quadratic change. The difference between types of caregiving status is more pronounced in terms of time (Figure 4.4A) than age (Figure 4.4B) given the sparseness of age-specific data in the panel survey.

Figure 4.5A illustrates mean levels of self-rated health by years and caregiving timing and Figure 4.5B illustrates mean levels of self-rated health by age and caregiving timing.

Figure 4.5A shows that women who take on caregiver roles early in the life course (i.e., at the age of 34 or younger) have better health than those who enter caregiver role at later ages or never become caregivers during the study. However, this distributional finding should be interpreted cautiously given that caregiving time is presumably confounded with age: younger women are more likely to be categorized as "early" caregivers than older women because they have fewer years of exposure to the risks of caregiving (e.g., aging parents). Figure 4.5B does not illustrate a consistent pattern of health differences across age by caregiving timing.

Figure 4.6A illustrates mean levels of self-rated health by years and caregiving intensity and Figure 4.6B illustrates mean levels of self-rated health by age and caregiving intensity. Figure 4.6A shows that women who provide high-intensity care (i.e., $\geq$ 1 hour of caregiving per day) have worse health than those who do not provide care or provide low-intensity care, with some exceptions. Again, the age-based results (Figure 4.6B) do not demonstrate a clear pattern of health differentials that is meaningful or interpretable because the estimates are not stable (or smooth) because of limited sample across age.

Growth Curve Models for Caregiving Status and Health

Table 4.2 reports the estimates for the effects of caregiving status on mean levels of health and health trajectories with adjustments for socioeconomic status, family context, and health behaviors. All models control for sociodemographic characteristics, including age at baseline, region, and urban/rural residence. Model 1 tests how mean levels of health differ by caregiving status. Results indicate that both caregivers and non-caregivers who have parents or parents-in-law with care needs have significantly worse average health than those who do not have parental care obligations (Coef. = -.079 and -.082; $p \leq .001$, respectively). This finding is consistent with expectations given that caregivers' health is hypothesized to be compromised due to the demanding nature of caregiving tasks. Interestingly, however, the magnitude of the negative effect of non-caregivers with parents/in-laws in need is even greater than that of caregivers. This finding suggests that those who have parents/in-laws with care needs, yet cannot fulfill their responsibilities, may be negatively impacted by the enormous social pressures in a family-centered society where filial norms are strong.

Model 2 examines the impact of caregiving status on the linear and quadratic growth rates in health in addition to initial mean levels of the health trajectories. Results indicate that caregiver status remains a negative predictor of health at the mean level (Coef. = -.149; $p \leq .001$) and that the estimated linear and quadratic growth rates are statistically significant in positive and negative magnitudes (Coef. = .032 and -.002; $p \leq .05$, respectively). This suggests that the average caregiver starts at a lower level of health than those without caregiving responsibilities; however, their health improves over time at a decreasing rate with advancing age. The quadratic patterning of this health trajectory suggests that caregivers adjust to their physically and psychologically demanding roles, and as a result, the detrimental effects of caregiving on health may ameliorate or level-off over time.

The results provide no evidence that the effects of deserting change in a linear or quadratic rate. It is also noteworthy that in Model 2, the magnitude of the effect of caregiving was greater than that of non-caregiving to parents/in-laws in need at the mean level when the linear and quadratic growth rate terms are introduced. This suggests that providing care over an extended period may be much more detrimental to health than bearing the guilt of not providing care to parents or parents-in-law in need of care over time.

Models 3, 4, and 5 include variables for socioeconomic status, family context, and health behaviors, respectively, and test the mediating effects of these categories of variables. Model 6 is the fully-adjusted model that includes all covariates as well as the key independent variables (i.e., caregiving variables). The magnitudes for the effect of caregiving on health remain consistent across models for the linear and quadratic grow rates. However, the average variation in initial status between caregivers and women who do not have care responsibilities is largely amplified in Model 4 with the inclusion of family context indicators (from -.149 to -.161) and marginally strengthened in Model 5 with the inclusion of health behaviors (from -.149 to -.154). The inclusion of socioeconomic factors (Model 3) has no impact on the effects of caregiving. The results for Model 4 are particularly interesting because they highlight the importance of family context (namely marital status and co-residence with parents/in-laws) for predicting how caregiving impacts women's health; it also reveals family context as a potential mechanism that may alleviate the poor health of caregivers. However, caution is warranted when interpreting the findings regarding family context. The sample is comprised of ever-married women, and thus, the marriage effect only reflects the differences between currently married women and a small group of women who are divorced or widowed. Moreover, although co-residence is highly correlated with caregiving, the protective effect of co-residence likely captures the beneficial attributes of living together that are net of the detrimental effects of caregiving on health.

Figure 4.7 plots the fully-adjusted estimates from Model 6 in Table 4.2 to present the key findings of predicted health trajectories for women by caregiving status. The results illustrate that the difference in initial health status is largest between caregivers and women without parental care obligations. Moreover, levels of health between caregivers and non-caregivers are nearly the same after approximately 8-10 years, followed by a precipitous decline in health among those with caregiving responsibilities. Alternatively, women who abandon their care responsibilities (i.e., deserters) have consistently worse health than those without care obligations. However, deserters do not experience comparable changes in health-decline that significantly vary over time between groups. However, the discrepancies in health trajectories among caregivers, deserters, and non-caregivers are dynamic over time and are not fully explained by differences in demographics, socioeconomic status, family context, and/or health behaviors.

Growth Curve Models for Caregiving Timing and Health

Table 4.3 reports the estimates for the effects of caregiving timing on mean levels of health and health trajectories after controlling for sociodemographic characteristics socioeconomic status, family context, and health behaviors. Results indicate that caregiving timing has no effect on the linear or quadratic changes in health. For the purpose of parsimony, the quadratic terms for early and late caregiving were dropped from the final analyses and only the effects for the intercept and linear growth rates are presented in the table. In Models 1 through 5, the effects of early caregiving and late caregiving were negative but not statistically significant.

In Model 6, early caregiving became a significantly negative predictor of initial health (Coef. = -.082; $p \leq .05$) with adjustments for sociodemographic factors, socioeconomic status, family context, and health behaviors. According to the changes in coefficients across models, it appears that heterogeneity in family context and health behaviors were the primary factors that suppressed the health consequences of early caregiving. Consistent with previous models, neither early caregiving nor late caregiving is significant in the linear growth rate in Model 6. This suggests that although women who become caregivers early suffer a detrimental toll on their health, the rate of decline does not differ from non-caregivers and those who become caregivers at later ages.

Figure 4.5 plots the estimates from Model 6 to demonstrate how women's health trajectories differ by caregiving timing over time. The figure clearly demonstrates how women's health is negatively impacted over time after entering the caregiver role at young age. Although the health of early caregivers does not decline at a faster rate than non-caregivers, they exhibit consistently worse health over time than non-caregivers because of their initially lower levels of health. This finding is somewhat remarkable given the comparable rate of health decline between early caregivers and late caregivers relative to non-caregivers. In other words, women entering the role of caregiving early are generally younger than women categorized as late caregivers, and yet, their health trajectories resemble those of women who are categorically older.

Growth Curve Models for Caregiving Intensity and Health

Table 4.4 reports the coefficients for the effects of caregiving intensity on women's mean levels of health and health trajectories over time. Model 1 tests how women's mean levels of health vary by caregiving intensity when sociodemographic characteristics are taken into account. Results indicate that caregivers who provide high-intensity care (i.e., ≥ 1 hour of caregiving per day) or low-intensity care (i.e., < 1 hour of caregiving per day) have significantly worse average initial health than those who do not provide care to either parents or parents-in-law (Coefficients = -.075; $p \leq .01$ and -.066; $p \leq .05$, respectively).

Model 2 assesses the impact of caregiving intensity on the linear and quadratic growth rates in health in addition to initial levels of health. Interestingly, the results indicate that high intensity continues to be a statistically significant predictor of health at the mean level and that the effect becomes much stronger (from = -.075 in Model 1 to -.192 in Model 2). In addition, the estimated effects of high intensity on the linear and quadratic growth rates are both statistically significant but in opposite directions (Coef. = .046 and -.003; $p \leq .05$, respectively). This finding suggests that the average caregiver who provides high-intensity care has initially lower levels of health than non-caregivers; however, their health declines at a decreasing rate with advancing age. The quadratic patterning of this health trajectory supports the resilience theory and suggests that caregivers with high levels of caregiving adjust to their roles of being caregivers. In other words, high-intensity caregivers appear to cope better with the demanding and/or tedious tasks of providing care after an initial manifestation of poor health.

Model 3 adds variables for socioeconomic status that include education, income, and employment. Despite the significant effect of income, the results suggest that socioeconomic resources do not mediate the detrimental effects of caregiving intensity, with coefficients remaining nearly unchanged from Model 2 to Model 3. Model 4 includes measures for family context and Model 5 includes measures for health behaviors; in both cases, the negative effects of high intensity at the intercept level and the positive effects of high intensity at the level of linear growth become stronger. This suggests that unmeasured differences in family context and health behaviors suppress the negative effect of high-intensity caregiving on health.

Model 6 examines the effects of caregiving intensity when adjusting for all of the covariates. Figure 4.6 plots the estimates from Model 6 in Table 4.4 to illustrate the key findings of predicted health trajectories for women by caregiving intensity. The figure shows that the largest difference in initial health exists between high-intensity caregivers and those who do not provide care for their parents or parents-in-law. The figure also shows that levels of health between caregivers engaging in high-intensity care, low-intensity care, and no care are nearly identical after approximately 5 to 10 years. However, after approximately 12 years, caregivers who provide high-intensity care experience a sharp decline in health, demonstrating the long-lasting and damaging effects of caregiving on health. Caregivers who engage in low-intensity care also exhibit worsening health over time, but the rate of decline is not as rapid as those engaging in high-intensity care.

4.7 DISCUSSION AND CONCLUSION

Chinese women are facing unprecedented challenges in providing care to a growing population of aging parents in a family-care oriented society. Because China's support system for the elderly has not yet matched the success of its economic institutions and infrastructure, numerous crucial unanswered questions have emerged. In this study, I proposed and examined the fundamental question: What are the health consequences for Chinese women who carry the weight of providing care to their aging parents? I use six waves of longitudinal data to provide the first investigation of how caregiving status, timing, and intensity affect health trajectories of women aged 18 to 52 in China.

Overall, I find support for life course theory and role strain theory in the analyses of caregiving status (Hypothesis 1a). Compared to non-caregivers, women who provide care to their parents/in-laws have lower self-rated health at all observed time-points. However, results also provide strong support for life course theory and partial support for an adaptation argument (Hypothesis 1c) and the wear-and-tear hypothesis (Hypothesis 1b). I find that caregivers, on average, have initially worse self-reported health than those who do not have parental care responsibilities. Over time, this initial health disparity diminishes in a pattern consistent with caregivers adapting to their status. After approximately 10-12 years, however, it appears that the wear-and-tear of caregiving takes its toll on health and leads to increasingly poor health. By the end of the observation period, I find that differences in health are widest between women who provide care and those who do not.

As expected, I find that those who do not provide care to parents/in-laws who have care needs have significantly worse average health than those who do not have parental care obligations (Hypothesis 1d). Furthermore, the pattern of health decline is similar to that of caregivers. These findings suggest that, in addition to the burdens of providing care, the strain of having parents in need of care may be great enough to exert a negative impact on health—regardless of whether women provided care. Interestingly, however, I find that the health of non-caregivers with parents in need is consistently *lower* than caregivers after initial levels of health. Although somewhat unanticipated, this result is consistent with research by Amirkhanyan and Wolf (2006) who found that, in the U.S., non-caregivers with parents in need had more symptoms of depression than their counterparts without disabled parents. In China, I suspect that the health of women who do not provide care for parents-in-need may be further compromised by the strong social pressures in a family-centered society where filial norms prevail and failing to fulfill these responsibilities may incur emotional strain and poor health. However, additional studies are needed to validate this finding and its possible explanation.

The timing of becoming a caregiver has significant consequences for health. Results for caregiving timing provide general support for life course theory and role strain theory (Hypothesis 2a). I find that early caregiving (at ages 18-34) is associated with initial and consistently lower health than late caregivers (at ages 35 and older) and non-caregivers. Although the health of early and late caregivers does not decline at a faster rate than non-caregivers, late caregivers exhibit worse health over time than non-caregivers—largely because of their initially lower levels of health. This finding is consistent with the life course perspective that emphasizes the importance of "timing and the role of timing in how people experience and cope with life course transitions (Turner et al. 2004: p.243)."

Caregivers who enter this role "off-time" (i.e., early in the life course) appear to struggle with the transition to caregiving and fulfilling the responsibilities entailed with the caregiving role. In addition, the demands of caregiving may interfere with the fulfillment of other social roles (e.g., education, work, and marriage) that are protective of health. As the economy grows and cultural norms become more westernized, a new generation of Chinese women (many of them children of the one-child policy) is becoming increasingly independent and career-minded. According to a recent survey of young professional women in China, approximately 75% of women considered themselves to be ambitious; compared to only 50% of their U.S. counterparts (Hewlett and Rashid 2011). The current results suggest that Chinese women who engage in caregiving at early ages—whether voluntary or not—appear to suffer by measures of poor self-rated health, as their peers embark on educational and career trajectories that match their ambitions.

The health consequences of becoming a caregiver at early ages, however, may not be absolute. Instead, there is some evidence to indicate that early caregivers exhibit improvements in health (i.e., slower rates of decline) relative to non-caregivers. Whether this finding can be attributable to the process of role adaptation over the life course (Hypothesis 2b) or because early caregivers are of categorically younger age, and thus manifest slower health decline, is not clear and warrants further investigation. However, it appears that after an extended period (i.e., approximately 20+ years according to Figure 4.5) early caregivers regain health to the levels of non-caregivers, perhaps after the competing demands of education, work, and family with caregiving have taken their toll (i.e., at ages 50+). Lastly, I find no clear evidence that late caregivers have increasingly poorer health than non-caregivers in a pattern consistent with a wear-and-tear process over the life course that was predicted at older ages (Hypothesis 2c).

Results demonstrate that the level of caregiving intensity also plays an important role in women's health status. Caregivers who provide high-intensity care (i.e., ≥ 1 hour of caregiving per day) have significantly worse average initial health status than non-caregivers. The overall magnitude of the negative effect of high-intensity care is greater than that of low-intensity care. As anticipated, low-intensity care (i.e., < 1 hour of caregiving per day) is only significantly associated with health in the absence of SES, family, and behavioral covariates. The results for high-intensity care provide support for life course theory, the wear-and-tear hypothesis (Hypothesis 3a), and adaptation (Hypothesis 3b). After initially low levels of health, high-intensity caregivers appear to recover (i.e., adapt) to their new responsibilities and exhibit levels of health that are comparable to those who do not provide care. However, following this period of hypothesized adaptation, women who provide ≥ 1 hour of caregiving per day experience a precipitous decline in health (akin to the pattern for caregiving status) that suggests the cumulative burden of providing care has a wearing effect on health. This latter finding is consistent with expectations and corroborates evidence from Western countries that the demands of caregiving are compatible with the wear-and-tear perspective (e.g., Vitaliano, Zhang, and Scanlan 2003).

Collectively, the results of this study suggest that caregiving is especially detrimental thealth at the initial stage of providing care and at later years of prolonged care. The initial shock of taking on the caregiving role is reflected in large differentials in health between caregivers and those without care responsibility, particularly among those who are early caregivers and those engaged in high-intensity care. The relatively sharp decline in health in subsequent years seems to reflect the course of aging that is further intensified by the cumulative demands of providing care, particularly at ages most detrimental to the recipients' physical health and functioning. Accordingly, studies have shown that the demands of caregiving often increase substantially in the final months of the patient's life, when terminal diseases are full blown (Waldrop et al. 2005). In addition to the initial and long-term effects of caregiving, this study also provides evidence to support the adaptation hypothesis. Caregivers' health is shown to improve over time as they presumably adjust to and learn the skills of caregiving in their new roles. As a result, health differentials between caregivers and non-caregivers and between high-intensity caregivers and non-caregivers are similar after approximately 6-8 years. These intriguing patterns of initial health and quadratic rates of change could not be explained by sociodemographic characteristics, socioeconomic status, family context, or health behaviors.

Two explanations for these findings are plausible. First, honoring filial piety (i.e., a source of "familism") may be operating as a coping mechanism or protective factor that exerts a positive influence on caregivers' health. Cross-national studies have shown that cultural values play an important role in alleviating caregiver burden and improving health among caregivers in the United States, Korea, and Spain (Knight and Sayegh 2010; Chun et al. 2007; Losada et al. 2006). Second, as suggested by the literature on resilience theory (see Suedfeld 1997 for a review), Chinese caregivers may possess certain psychological traits—such as a strong sense of control, optimism, self-efficacy, problem-solving abilities, and social competence—that are lacking in non-caregivers (e.g., Affleck and Tennen 1996; Smith 2006). These traits may enable caregivers to obtain and mobilize resources that would typically be unavailable to them and overcome the health deficits associated with providing care to others. However, the validity of these explanations could not be assessed in the current study due to data limitations. Therefore, I encourage future studies to investigate how familial values and psychological traits may play a role in the health trajectories of women in China and other cultures.

Despite the strengths of this study, there are several limitations that should be noted. First, data limitations prohibited me from including several important measures. For example, additional variables for care provided by siblings, spouses, or other relatives, attitudes toward filial piety, and relationships with parents/in-laws, would help to better contextualize and understand the current findings.

Second, the age range of the sample is limited to 18-52 years. Although these ages capture an extensive and important period of the life course, it is unknown whether and to what degree these patterns extend into late middle-age and older adulthood. Therefore, future research should examine these associations at later ages when caregivers face the additional prospects of their own health decline. Third, the intervals between EMW surveys are not uniform and, for two waves, include a 4-year gap (i.e., 1993-1997 and 2000- 2004). Although the longitudinal data used for these analyses are significantly better than existing research, I acknowledge that they lack some precision in identifying the timing of and transitions in/out of caregiving. Finally, this study does not take into account the characteristics (e.g., health condition(s), resources, etc.) of those requiring care. Although health status of parents and parents-in-law was not measured, I examined an indicator for whether parents or parents-in-law are in need of care as a proxy for their health status. However, this variable was ultimately dropped because it correlates almost perfectly with caregiving status. And although information is available for women who co-reside with parents/in-laws, more than three-quarters of women in the EMWS do not reside with their parents/in-laws and thus lack this information (see Table 4.1).

In conclusion, this study contributes to the literature on caregiving by providing new evidence of how the status, timing, and intensity of providing parental care affect health trajectories in China. Overall, I find evidence to support role strain, wear-and-tear, and in some cases, a pattern of resilience that is consistent with role adaptation. Daughters and daughters-in-law are the undeniable backbone of the caregiving system in China and their contributions to the care of the largest and fastest growing elderly population cannot be overstated. However, the immediate and long-term health effects of providing parental care has only recently received attention in the aging literature. If progress is to be made, interventions such as support networks and programs to alleviate the burden of care are needed to improve the health and well-being of caregivers. Policymakers need to identify viable alternatives to the investments of women who shoulder the major demands of old-age support in China. For example, greater investments should be directed toward developing/improving resources and support systems to provide wider access to infrastructures that offer care, including institutional care facilities, elderly community centers, and rehabilitative centers. Support groups for caregivers and community in-home services also should be priorities to lessen the burden of care among family members. Otherwise, the public health consequences of a rapidly aging population in China may reach all segments of society.

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Table 4.1 Descriptive Statistics for Selected Dependent and Independent Variables (N=17,122)

	Mean	SD
Self-rated health	2.827	0.706
Caregiver±	0.069	0.253
Caregiver for parents	0.038	0.190
Caregiver for parents-in-law	0.036	0.187
Non-caregiver (with obligations)	0.090	0.286
High intensity (vs. no care)	0.033	0.180
Low Intensity (vs. no care)	0.035	0.184
Early caregiving (vs. never)	0.054	0.226
Late caregiving (vs. never)	0.184	0.387
Sociodemographic Characteristics		
Age	37.672	8.457
Northeast (vs. Coastal)	0.186	0.389
Inland (vs. Coastal)	0.353	0.478
Mountain (vs. Coastal)	0.232	0.422
Urban (vs. rural)	0.290	0.454
Socioeconomic Status		
Education (vs. primary school or less)	0.539	0.498
Family Income (vs. lowest quintile)	0.806	0.395
Working (vs. not working)	0.796	0.403
Family Context		
Married status (vs. not married)	0.934	0.248
Number of children	1.366	1.163
Co-residing with parents/in-laws (vs. no)	0.261	0.439
Health Behaviors		
Smoking (vs. not smoking)	0.023	0.150
Drinking (vs. not drinking)	0.103	0.304
BMI	22.640	3.119

± Reference category for caregiving subgroups is women without caregiving obligations

Table 4.2 Growth Curve Models for Caregiving Status and Women's Health in China (N=17,122)

Fixed Effects	Model 1 Coef. (SE)	Model 2 Coef. (SE)	Model 3 Coef. (SE)	Model 4 Coef. (SE)	Model 5 Coef. (SE)	Model 6 Coef. (SE)
Intercept						
Intercept	3.520***	3.524***	3.461***	3.432***	3.281***	3.140***
	(0.031)	(0.031)	(0.037)	(0.037)	(0.051)	(0.058)
Caregiver	-0.079***	-0.149***	-0.149***	-0.161***	-0.154***	-0.167***
	(0.021)	(0.044)	(0.044)	(0.044)	(0.045)	(0.045)
Non-caregiver (with obligations)	-0.082***	-0.083#	-0.085*	-0.093*	-0.090*	-0.100*
	(0.018)	(0.043)	(0.043)	(0.043)	(0.044)	(0.044)
Linear Growth Rate						
Intercept	-0.008*	-0.011**	-0.012**	-0.012**	-0.014**	-0.015***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Caregiver		0.032*	0.032*	0.033*	0.033*	0.035*
		(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Non-caregiver (with obligations)		0.007	0.007	0.008	0.009	0.011
		(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Quadratic Growth Rate						
Intercept	-0.001**	-0.001	-0.001	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Caregiver		-0.002*	-0.002*	-0.002*	-0.002*	-0.002*
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Non-caregiver (with obligations)		-0.001	-0.001	-0.001	-0.001	-0.001
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Control Variables						
Sociodemographic Characteristics						
Age at baseline	-0.014***	-0.014***	-0.014***	-0.013***	-0.015***	-0.014***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Northeast (vs. coastal)	-0.092***	-0.092***	-0.094***	-0.086***	-0.092***	-0.089***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Inland (vs. coastal)	-0.174***	-0.174***	-0.171***	-0.169***	-0.165***	-0.158***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	(0.017)
Mountain (vs. coastal)	-0.284***	-0.284***	-0.281***	-0.281***	-0.264***	-0.260***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Urban (vs. rural)	0.056***	0.056***	0.046**	0.053***	0.052***	0.041**
	(0.013)	(0.013)	(0.014)	(0.014)	(0.013)	(0.014)

(Continued on next page)

Table 4.2. (Cont.)

Fixed Effects	Model 1 Coef. (SE)	Model 2 Coef. (SE)	Model 3 Coef. (SE)	Model 4 Coef. (SE)	Model 5 Coef. (SE)	Model 6 Coef. (SE)
Socioeconomic Status						
High education			0.024 (0.013)			0.026 (0.013)
High income			0.030* (0.014)			0.024 (0.014)
Working			0.018 (0.014)			0.019 (0.014)
Family Context						
Married				0.070** (0.023)		0.065** (0.023)
Number of children				-0.009 (0.005)		-0.007 (0.005)
Co-residing with parents/in-laws				0.041** (0.014)		0.036** (0.014)
Health Behaviors						
Drinking					-0.014 (0.018)	-0.014 (0.018)
Smoking					-0.040 (0.038)	-0.033 (0.038)
BMI					0.012*** (0.002)	0.012*** (0.002)
Random Effects-Variance Components						
Level-1: within-person	0.094***	0.093***	0.093***	0.093***	0.091***	0.090***
Level-2: In intercept	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***
In linear growth rate	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
Goodness-of-fit						
BIC (smaller is better)	35265.6	35302.9	35312.3	35300.7	34541.0	34553.4
Log Likelihood	35230.3	35267.6	35277.0	35265.4	34505.8	34518.3

Note: standard errors in parentheses.

*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$, two-tailed test

Table 4.3 Growth Curve Models for Caregiving Timing and Women's Health in China (N=17,122)

Fixed Effects	Model 1 Coef. (SE)	Model 2 Coef. (SE)	Model 3 Coef. (SE)	Model 4 Coef. (SE)	Model 5 Coef. (SE)	Model 6 Coef. (SE)
Intercept						
Intercept	3.533***	3.532***	3.469***	3.447***	3.292***	3.158***
	(0.031)	(0.032)	(0.037)	(0.037)	(0.051)	(0.058)
Early caregiver	-0.044	-0.055	-0.057	-0.069	-0.068	-0.082*
	(0.027)	(0.038)	(0.038)	(0.038)	(0.039)	(0.039)
Late caregiver	-0.026	-0.014	-0.015	-0.019	-0.022	-0.029
	(0.016)	(0.023)	(0.023)	(0.023)	(0.024)	(0.024)
Linear Growth Rate						
Intercept	-0.008*	-0.008*	-0.009*	-0.009*	-0.011**	-0.012**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Early caregiver		0.002	0.002	0.003	0.004	0.004
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Late caregiver		-0.002	-0.002	-0.002	-0.001	-0.001
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Quadratic Growth Rate						
Intercept	-0.001**	-0.001**	-0.001**	-0.001*	0.000**	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control Variables						
Sociodemographic Characteristics						
Age at baseline	-0.015***	-0.015***	-0.014***	-0.014***	-0.015***	-0.014***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Northeast (vs. coastal)	-0.095***	-0.094***	-0.096***	-0.089***	-0.094***	-0.092***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Inland (vs. coastal)	-0.176***	-0.176***	-0.173***	-0.171***	-0.167***	-0.160***
	(0.016)	(0.016)	(0.017)	(0.017)	(0.017)	(0.017)
Mountain (vs. coastal)	-0.284***	-0.284***	-0.281***	-0.281***	-0.264***	-0.260***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Urban (vs. rural)	0.053***	0.054***	0.044**	0.050***	0.051***	0.039**
	(0.013)	(0.013)	(0.014)	(0.014)	(0.013)	(0.014)
Socioeconomic Status						
High education			0.023			0.025
			(0.013)			(0.013)
High income			0.030*			0.024
			(0.014)			(0.014)
Working			0.018			0.019
			(0.014)			(0.014)

Table 4.3. (Cont.)

Fixed Effects	Model 1 Coef. (SE)	Model 2 Coef. (SE)	Model 3 Coef. (SE)	Model 4 Coef. (SE)	Model 5 Coef. (SE)	Model 6 Coef. (SE)
Family Context						
Married				0.069** (0.023)		0.065** (0.023)
Number of children				-0.009 (0.005)		-0.008 (0.005)
Co-residing with parents/in-laws				0.037** (0.014)		0.033* (0.014)
Health Behaviors						
Drinking					-0.016 (0.018)	-0.016 (0.018)
Smoking					-0.040 (0.038)	-0.034 (0.038)
BMI					0.012*** (0.002)	0.012*** (0.002)
Random Effects-Variance Components						
Level-1: within-person	0.095***	0.095***	0.094***	0.095***	0.092***	0.091***
Level-2: In intercept	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***
In linear growth rate	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
Goodness-of-fit						
BIC (smaller is better)	35292.5	35310.1	35319.5	35310.2	34547.2	34561.4
Log Likelihood	35257.3	35274.8	35284.2	35274.9	34512.1	34526.2

Note: standard errors in parentheses.

*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$, two-tailed test

Table 4.4 Growth Curve Models for Caregiving Intensity and Women's Health in China (N=17,122)

Fixed Effects	Model 1 Coef. (SE)	Model 2 Coef. (SE)	Model 3 Coef. (SE)	Model 4 Coef. (SE)	Model 5 Coef. (SE)	Model 6 Coef. (SE)
Intercept						
Intercept	3.523*** (0.031)	3.527*** (0.031)	3.464*** (0.037)	3.438*** (0.036)	3.285*** (0.051)	3.149*** (0.058)
High intensity	-0.075** (0.029)	-0.192** (0.063)	-0.193** (0.063)	-0.208** (0.063)	-0.204** (0.065)	-0.220*** (0.065)
Low intensity	-0.066* (0.028)	-0.099 (0.059)	-0.099 (0.059)	-0.106 (0.059)	-0.098 (0.061)	-0.105 (0.061)
Linear Growth Rate						
Intercept	-0.009* (0.004)	-0.011** (0.004)	-0.012** (0.004)	-0.012** (0.004)	-0.013*** (0.004)	-0.015*** (0.004)
High intensity		0.046* (0.021)	0.046* (0.021)	0.048* (0.021)	0.049* (0.022)	0.051* (0.022)
Low intensity		0.019 (0.021)	0.018 (0.021)	0.020 (0.021)	0.019 (0.021)	0.019 (0.021)
Quadratic Growth Rate						
Intercept	-0.001** (0.000)	-0.001* (0.000)	-0.001* (0.000)	0.000# (0.000)	-0.001* (0.000)	0.000 (0.000)
High intensity		-0.003* (0.001)	-0.003* (0.001)	-0.003* (0.001)	-0.003* (0.001)	-0.003* (0.001)
Low intensity		-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Control Variables						
Sociodemographic Characteristics						
Age at baseline	-0.014*** (0.001)	-0.014*** (0.001)	-0.014*** (0.001)	-0.014*** (0.001)	-0.015*** (0.001)	-0.014*** (0.001)
Northeast (vs. coastal)	-0.094*** (0.019)	-0.094*** (0.019)	-0.096*** (0.019)	-0.088*** (0.019)	-0.094*** (0.019)	-0.091*** (0.019)
Inland (vs. coastal)	-0.176*** (0.016)	-0.176*** (0.016)	-0.173*** (0.017)	-0.171*** (0.017)	-0.167*** (0.017)	-0.160*** (0.017)
Mountain (vs. coastal)	-0.284*** (0.018)	-0.284*** (0.018)	-0.281*** (0.018)	-0.281*** (0.018)	-0.264*** (0.018)	-0.259*** (0.018)
Urban (vs. rural)	0.055*** (0.013)	0.055*** (0.013)	0.045** (0.014)	0.051*** (0.014)	0.052*** (0.013)	0.040** (0.014)

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Table 4.4 (Cont.)

Fixed Effects	Model 1 Coef. (SE)	Model 2 Coef. (SE)	Model 3 Coef. (SE)	Model 4 Coef. (SE)	Model 5 Coef. (SE)	Model 6 Coef. (SE)
Socioeconomic Status						
High education			0.023 (0.013)			0.025 (0.013)
High income			0.030* (0.014)			0.024 (0.014)
Working			0.018 (0.014)			0.018 (0.014)
Family Context						
Married				0.066** (0.023)		0.062** (0.023)
Number of children				-0.009 (0.005)		-0.008 (0.005)
Co-residing with parents/in-laws				0.040** (0.014)		0.035* (0.014)
Health Behaviors						
Drinking					-0.015 (0.018)	-0.016 (0.018)
Smoking					-0.038 (0.038)	-0.032 (0.038)
BMI					0.012*** (0.002)	0.012*** (0.002)
Random Effects-Variance Components						
Level-1: within-person	0.094***	0.094***	0.094***	0.094***	0.091***	0.090***
Level-2: In intercept	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***
In linear growth rate	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
Goodness-of-fit						
BIC (smaller is better)	35284.3	35318.6	35328.2	35317.9	34556.4	34570.3
Log Likelihood	35249.0	35283.3	35292.9	35282.6	34521.2	34535.1

Note: standard errors in parentheses.

*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$, two-tailed test

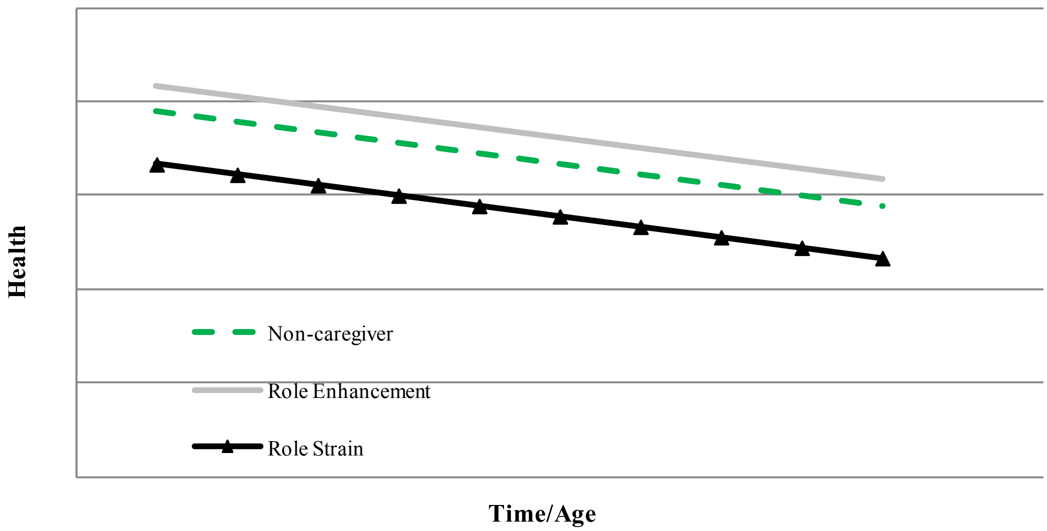

Figure 4.1A Prediction of Health Trajectories by Different Theoretical Perspectives

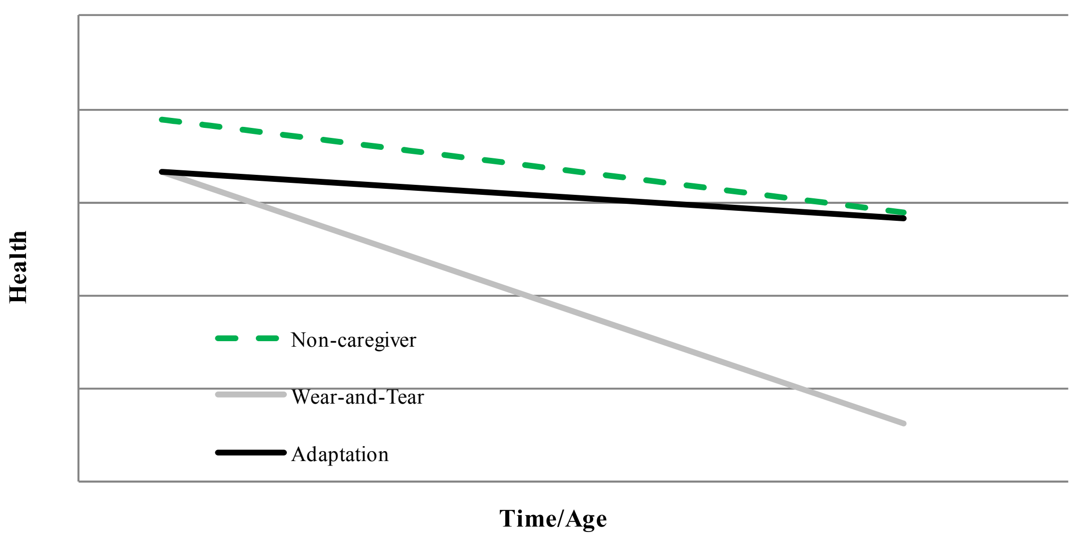

Figure 4.1B Prediction of Health Trajectories by Different Theoretical Perspectives

Figure 4.2 Participating Provinces in the China Health and Nutrition Survey

$$\begin{bmatrix} \sigma_1^2 & \sigma_1\sigma_2\rho_{21} & \sigma_1\sigma_3\rho_{31} & \sigma_1\sigma_4\rho_{41} \\ \sigma_2\sigma_1\rho_{21} & \sigma_2^2 & \sigma_2\sigma_3\rho_{32} & \sigma_2\sigma_4\rho_{42} \\ \sigma_3\sigma_1\rho_{31} & \sigma_3\sigma_2\rho_{32} & \sigma_3^2 & \sigma_3\sigma_4\rho_{43} \\ \sigma_4\sigma_1\rho_{41} & \sigma_4\sigma_2\rho_{42} & \sigma_4\sigma_3\rho_{43} & \sigma_4^2 \end{bmatrix}$$

Figure 4.3 Unstructured Covariance Matrix

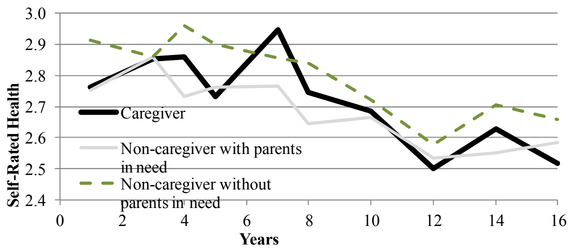

Figure 4.4A Average Self-Rated Health by Caregiving Status and Year

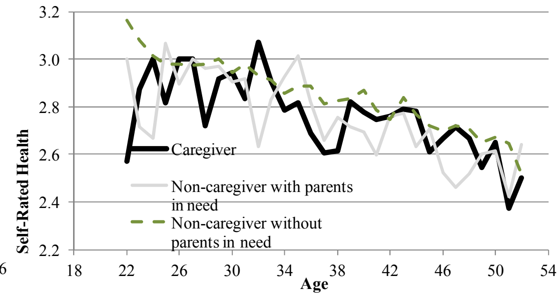

Figure 4.4B Average Self-Rated Health by Caregiving Status and Age

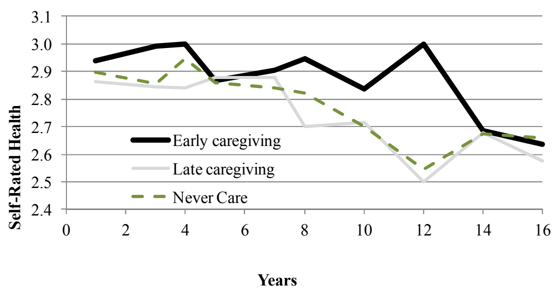

Figure 4.5A Average Self-Rated Health by Caregiving Timing and Year

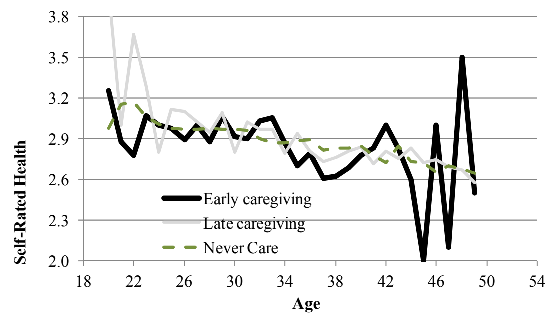

Figure 4.5B Average Self-Rated Health by Caregiving Timing and Age

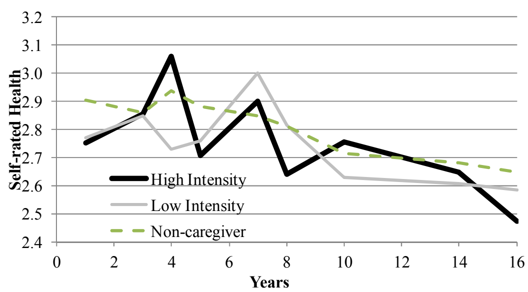

Figure 4.6A Average Self-Rated Health by Caregiving Intensity and Year

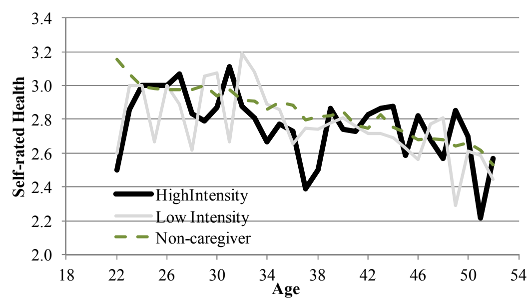

Figure 4.6B Average Self-Rated Health by Caregiving Intensity and Age

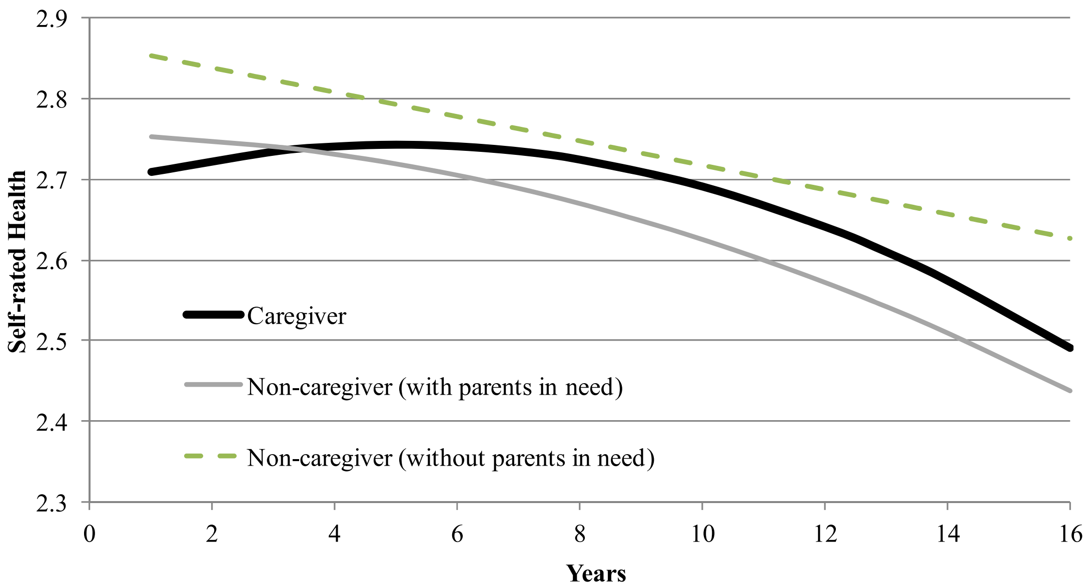

Figure 4.7 Predicted Trajectories of Self-Rated Health by Caregiving Status among Women in China

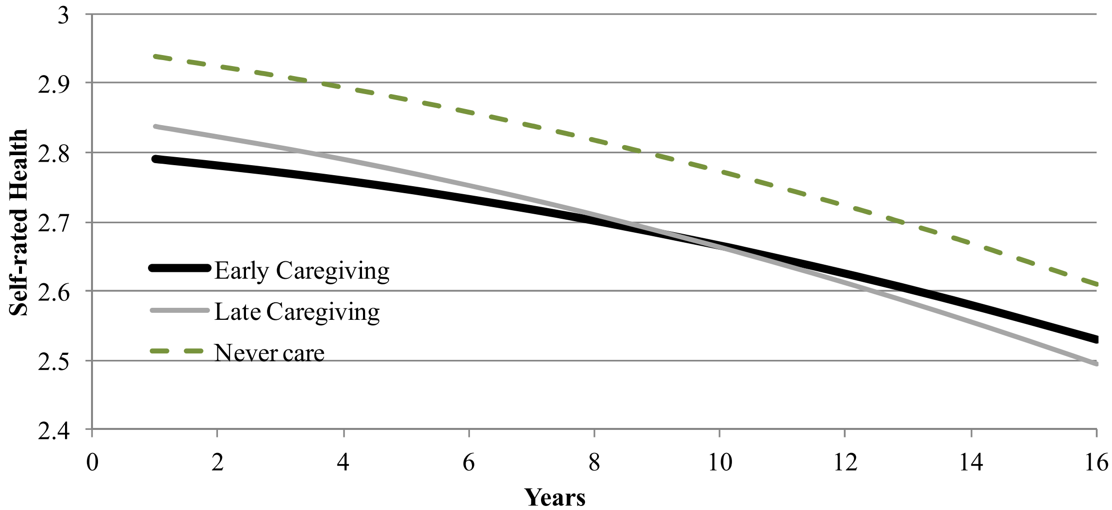

Figure 4.8 Predicted Trajectaries of Self-Rated Health by Caregiving Timing among Women in China

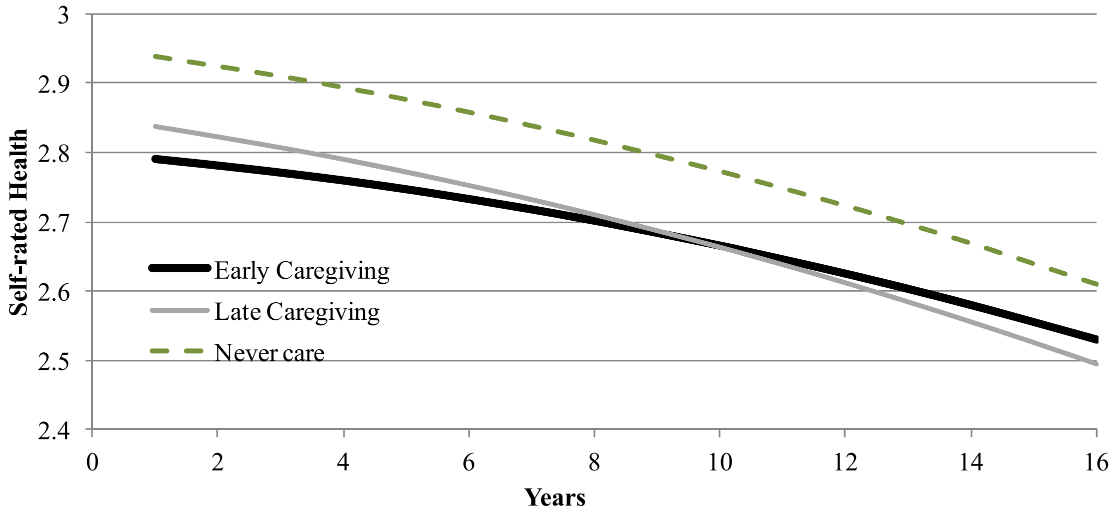

Figure 4.8 Predicted Trajectaries of Self-Rated Health by Caregiving Timing among Women in China

CHAPTER 5

CONCLUSION

Population aging has reached all areas of the globe and has raised several critical questions. Can China meet the challenges of caring for the largest aging population in the world? How do individuals, families, the government, and society as a whole respond to the growing needs of the older adults who are living longer but not necessarily healthier? Using multiple waves of panel data and sophisticated statistical methods, this dissertation provides the first large-scale longitudinal analysis of caregiving patterns and their health implications on young-adult and middle-aged women in China. The overarching goal of this research is to provide a comprehensive picture of the individual and contextual factors associated with caregiving and its consequences in women over a significant portion of their life course.

Three major research objectives were proposed and examined: First, to investigate the factors that increase or decrease women's likelihood of becoming a caregiver; Second, to examine the factors that influence women's provision of care; Third, to study the influence of caregiving status, timing, and intensity on the health of young-adult and middle-aged women in China. In previous chapters, I carefully reviewed the social and historical background of caregiving in China and provided in-depth theoretical analyses of this crucial social issue of elder care currently underway in this nation. Overall, I find strong support for the life course concept of contextual embeddedness and the principle of linked lives; and I find limited support for the interdependence of life spheres. In terms of a life course development argument, I find significant evidence for the role of changes in socioeconomic resources for caregiving transitions but not for caregiving time.

In sum, the results of this dissertation highlight the importance of life course theory for studying the patterns and consequences of caregiving in China. Life course perspectives are shown to be particularly useful for disentangling different components of caregiving (i.e., status, timing, and intensity) and their impact on health. Table 5.1 summarizes the major findings and how life course concepts inform our understanding of caregiving in young-adult and middle-aged women in China. This chapter summarizes the major findings, identifies key theoretical and empirical contributions of the study, and discusses the policy implications of the results.

5.1 TRADITIONS AND TRANSFORMATIONS

A coherent narrative emerges from the three analytical chapters of this dissertation (Chapters 2-4). Traditions and change coexist in a rapidly-developing Chinese society. On one hand, traditional filial norms remain entrenched in society and caregiving patterns generally live up to cultural expectations. The needs of older adults not only promote women to assume caregiving roles (Chapter 2) but also determine the amount of care they provide to their aging parents and parents-in-law (Chapter 3). Moreover, it is especially striking that socially and structurally advantaged women are more likely to become caregivers and provide more care than disadvantaged women. I demonstrate patterns to suggest that Chinese women are altruistically motivated to provide care despite their resources available to opt-out of their filial responsibilities with alternative (paid) care. Instead, women with resources utilize these individual and structural advantages to better care for their parents and parents-in-law.

On the other hand, I find evidence of newly defined cultural norms and caregiving patterns. In western countries, it is typically daughters who shoulder the majority of caregiving responsibilities for their aging parents (Horowitz 1981). However, traditional filial norms in China designate sons and daughters-in-law as the key caregivers in society. Despite these cultural customs, I find that Chinese women are challenging the patriarchal and patrilineal traditions of elder care and redefining their roles as daughters and daughters-in-law. The proportion of women providing care for their parents (57%) and for their parents-in-law (53%) is comparable (Chapter 2). This trend is consistent with recent evidence that married daughters provide more financial assistance to their aging parents than do sons in urban China (Xie and Zhu 2006) and underscores the growing involvement of daughters in old-age support. Urban women in particular appear to be the pioneers of these changing norms—as evidenced by the low rates of caregiving among employed daughters-in-law in urban areas.

Additional studies should address whether and to what extent the increasing educational and career achievements of Chinese women may conflict with the fulfillment of caregiving responsibilities. In China, many independent and career-minded women are caught between their social roles and family responsibilities, and the results of this study suggest that women's health may suffer as a consequence. For example, women who enter the caregiving role "off-time" (i.e., early in the life course) appear to struggle with the transition to caregiving and fulfilling the responsibilities expected of this role (Chapter 4).

5.2 OPPORTUNITIES AND CHALLENGES

In a society that lacks a national social security system, the role of family is crucial for ensuring the care and well-being of its older population. The results of this dissertation consistently highlight the pervasiveness of familial norms in China. Most indicative of this conclusion is the finding that women with adequate economic resources do not buy their way out of their caregiving obligations (Chapter 2). Furthermore, the non-significant effects of education and income on the time spent on caregiving suggest that high and low SES women are equally willing and able to provide care to their parents and parents-in-law (Chapter 3). Instead, strong filial norms provide a solid foundation for strengthening intergenerational relationships and maintaining the centrality of family-care in China.

Despite the benefits of familial care, challenges to this current system of caregiving are enormous and growing. Historically, the Chinese government experimented with economic and social policies in certain provinces and regions before they were implemented nationwide (Bell, Khor, and Kochhar 1993). And although the strategic allocation of these policies was not intended to foster inequality, regional differences in economic development and welfare structure ensued. In line with these geo-structural disparities, I find striking regional, urban-rural, and community-level differences in transitions to caregiving and time spent on caregiving for parents and parents-in-law. Although these findings were not unexpected, it remains to be seen whether this is an unavoidable consequence of a fast-developing nation, or whether these differences will remain a permanent fixture of inequality in the allocation of social welfare and healthcare resources.

5.3 WEAR-AND-TEAR AND ADAPTATION

Life course theory serves as the overarching framework for this dissertation and is a useful perspective for integrating the individual and contextual factors leading to health differences related to the dynamics of caregiving. In Chapter 4's analysis of the health implications of caregiving, I test for evidence to support/refute role strain-enhancement theory, role adaptation, and the wear-and-tear hypothesis. Overall, the findings provide strong support for role strain theory and lend partial support to role adaptation theory and the wear-and-tear hypothesis. Caregivers have initially worse self-reported health than those who do not have parental care responsibilities. Over time, this initial health disparity diminishes in a pattern consistent with caregivers adapting to their status. However, the wear-and-tear of caregiving takes its toll on health and eventually leads to increasingly poor health after almost a decade of caregiving.

The health trajectories associated with caregiving intensity are similar to the patterns of health trajectories associated with caregiving status. After initially low levels of health, high-intensity caregivers adapt to their new responsibilities and exhibit levels of health that are comparable to those who do not provide care. Following this period of hypothesized adaptation, women who provide high intensity care experience a precipitous decline in health that suggests the cumulative burden of providing care has a wearing effect on health.

5.4 POLICY IMPLICATIONS

As previously suggested, caring for the largest aging population in the world is difficult and its implications are complex. Despite impressive levels of economic success in China over the last several decades, there are enormous challenges ahead for the development of its old-age support system. The following section discusses the implications of my research findings and offers suggestions for public health policy.

Developing National Social Security System

The current Chinese social security system is primarily employer based. However, as a byproduct of its market economy, unemployment rates are high and continue to rise. Therefore, it is imperative that a successful social security system will provide coverage for both employed and unemployed citizens. In China, most rural older-adults lack the social "safety nets" that help protect urban older-adults from the health risks associated with advancing age. In response, various social insurance schemes are currently in their infancy in rural areas (Wang 2006), although the returns from such programs are often too limited to cover basic living expenses. Nevertheless, it is important to continue investing in and improving these programs to meet the needs of those with differing levels of socioeconomic standing. In particular, policymakers should make efforts to minimize regional disparities and the urban-rural divide in areas of economic investment, distributions of old-age fund, and the implementation of tailored welfare programs.

In sum, the government must strike a balance between developing its economy and caring for its senior citizens. Investing in old-age support may not be the most cost-beneficial option, but if left unaddressed, the aging population in China will incur enormous human and financial costs across society.

Providing Support to Caregivers

Daughters and daughters-in-law are the undeniable backbone of the caregiving system in China. My study highlights the detrimental effects of providing care, particularly high-intensity care, on the health trajectories of caregivers. An important direction for policy should be to provide support networks and programs designed to alleviate the burdens of caregiving. For example, support groups for caregivers and community in-home services should be given priority to lessen the demand of caring among family members. Educational programs also can be designed to promote the caregiving roles of husbands and sons who can reduce women's overall caregiving burden. Rural women whose spouses and siblings migrate from home to pursue work in urban areas are particularly vulnerable and warrant special attention. Community resources are in great demand to meet the needs of those with migrating family members.

Developing Institutional Care

Policymakers need to identify viable institutional alternatives (i.e., nursing homes) to the investments of women who shoulder the major demands of old-age support. In China, institutionalized adults not only face the challenges of aging and social readjustment, but they also confront a long history of societal stigma and cultural stereotypes in the absence of familial care. However, recent studies suggest that Chinese older-adults and their children are increasingly accepting of institutional care. For example, a study of 265 institutionalized adults in Tianjin, China showed that elders' overall evaluation of their facility was high and that the majority of residents expressed a willingness to remain in the institution rather than return to the community (Zhan, Liu, and Guan 2006). Studies have also shown that institutionalized oldest-old adults report higher quality of life than the oldest-old living in other arrangements—i.e., living alone, with family, and with others (Zhan and Qin 2010; Zhou and Qian 2008). Given that institutional care has a relatively short history in China, government regulations are needed to ensure quality of care and minimize or eliminate elder abuse and neglect.

Previous research shows that rural older-adults have limited access to professional care because the majority of institutions are concentrated in urban areas (Gu, Dupre, and Liu 2007; Ministry of Civil Affairs 2005). Caregiving needs are further intensified by the unavailability of the children who migrate from home for employment. Therefore, it is critical to build more economically accessible institutions in rural areas and find ways to provide sufficient health care resources to the majority of the elderly population in China who live in rural areas.

5.5 LIMITATIONS AND FUTURE RESEARCH

Despite the strengths of this body of research, I acknowledge several limitations that warrant future inquiry. First, in terms of measurement, a lack of variables for care provided by siblings, spouses, or other relatives, relationships with parents/in-laws, and migration status of family members prohibited me from examining the complex contexts of caregiving in greater detail. I encourage future research to consider these factors using large, national data. Second, the sample used for the analysis is limited to young-adult and middle-aged women. Therefore, the findings are not generalizable to older women, or men. Future studies should include both men and women in young, middle, and older adulthood to provide a more complete picture of the results described here. It may be particularly insightful to demonstrate the potential gender dynamics of caregiving in contemporary China. Third, I was unable to directly test whether women's caregiving behaviors were motivated by altruistic purposes (i.e., altruism perspective) or self considerations (i.e., exchange perspective) due to a lack of information on individuals' attitudes toward filial piety. Finally, although the study design is prospective, it does not collect information on past experiences, attitudes, and relationship with parents and parents-in-law. Therefore, more studies are needed to show whether and to what degree financial transfers from aging parents during earlier years may motivate children to become caregivers and reciprocate their support at later times.

In conclusion, this dissertation addresses a gap in the literature by providing a comprehensive picture of caregiving by young-adult and middle-aged women in China. Using national longitudinal data, this research makes important theoretical and empirical contributions to our understanding of caregiving by examining its patterns and health implications in the context of changing cultural norms, population aging, and urban-rural migration in China.

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Table 5.1. Summary of Life Course Concepts, Measures, and Caregiving Outcomes

Life Course Concepts	Measures	Caregiving Transitions (Chapter 2)	Caregiving Time (Chapter 3)
Contextual Embeddedness	Sociodemographic Characteristics	Strong Support	Strong Support
	Community Characteristics	Limited Support	Strong Support
Life Course Development	Socioeconomic Resources	Support	No Support
Interdependence of Life Spheres	Social Roles	Limited Support	Limited Support
Linked Lives	Caregiving Risks	Strong Support	Strong Support