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Grandparents Raising Grandchildren:

Ethnic and Household Differences in Health and Service Use

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Abstract

Purpose: This study aimed to compare the characteristics of grandparent caregivers from different ethnicities and household structures, and to explore the associations between these two factors and their health or the use of public income support programs. **Design and Methods:** With the 2005-2007 American Community Survey (ACS), White, African American, Asian American, and Hispanic grandparent caregivers in skipped generation and three-generation households were compared. In multivariate analysis, sequential three models for each measure of health and public program use were executed. **Results:** Even though higher rates of health limitations in African Americans and grandparent caregivers living in skipped generation households were evident at the bivariate level, these negative aspects were positively shifted when their demographic and caregivng duration factors were adjusted. Only Hispanics in skipped generation households continuously showed higher limitations in health compared to Whites in the households. Among impoverished grandparent caregivers, African Americans were more likely to receive financial assistance and food stamps than other ethnic groups. In terms of household structure, skipped generation households were related to lower recipient rate of food stamps and higher recipient rate of financial assistance. **Implication:** Findings suggest that health or social service practitioners and public policy makers should approach at-risk ethnic grandparent caregiver groups in a culturally competent manner. Public income support programs should reform the programs' accessibility and eligibility for underserved grandparent caregiver groups.

Introduction

The number of grandparents raising grandchildren has dramatically increased over the past 30 years (Kropf & Yoon, 2006). According to the 2000 US Census, 5.8 million adults live in the same household with one or more of their grandchildren, who are under the age of 18. Included in this figure are over 2.4 million individuals who report being responsible for one or more of those grandchildren. Other data from the U.S. Current Population Survey (Fields, 2003) indicate 3.7 million children to be living in grandparent-headed families in 2002, a number that has almost doubled since 1970. Although grandparents from all ethnic and racial groups have become primary caregivers or co-caregivers, there are distinct racial and ethnic differences in prevalence. The 2000 Census revealed that African American adults are most likely to be grandparents who are responsible for their grandchildren, followed by Latinos, Asian Americans, and Whites: 15% of African Americans, 8% of Latinos, 5% of Asian Americans, and less than 2% of Whites between age 55 and 64.

This study identified grandparents who are caring for grandchildren in two different types of households: skipped-generation households, in which a grandparent and grandchild live together but no parent is present, and three-generation shared care households, in which the grandparent claims responsibility for the grandchild but one or more of the child's parents are also present. Few studies have looked at the health of grandparents caring for their grandchildren in terms of household structure (Goodman & Silverstein, 2002, 2006), and no study has examined Asian American grandparent caregivers in the effects of caring for grandchildren in different household structures. Moreover, the health and public service use among grandparent caregivers with different ethnicity backgrounds only has been examined separately by ethnicity in several different studies, not compared in the same study (Fuller-Thomson & Minkler, 2005,

2007). We address this important gap by examining relations of both ethnicity and household structure to health and public service use in this paper across four ethnic groups including Whites, African Americans, Hispanics, and Asian Americans.

Literature Review

Theoretical Framework

Life course theory provides a useful framework for the study of caregiving in later life (Beaumont & Kenealy, 2004; Phua & Kaufman, 2008). The life course refers to "age-graded life patterns embeded in social structures and cultures that are subject to historical change" (Elder, 1996, p. 31) . Changes in the life course shape the content, form, and process of individual development partly by the aging of the individual as well as by the social forces (Elder, 1996). Therefore, individuals experience their life course changes differently based on their society, culture, and the timing of developmental changes.

The four themes of the life course theory shape how we approach the issue of grandparent caregiving. They are "(1) the interplay of human lives and changing historical times and place, (2) human agency of choice making and social constraints, (3) the timing of lives, and (4) linked or interdependent lives – the embeddedeness of individual lives in a matrix of social relationships over time" (Elder, 1996, p. 35). Ethnicity and race are common indicators used to examine the effects of historical time and place, and the extent of human agency on different aspects of linked lives. For example, Phua and Kaufman (2008) found that older adults show diverse patterns of grandparent caregiving according to the timing of immigration and their ethnicity. Considering linked lives, grandparent caregivers could be influenced by their status as householders and co-residence with their grandchildren and adult children (Yoon, 2005).

Specifically, grandparent caregivers' health status is likely to be tempered by the household situation and their social role in it.

With the social regulation or constraints, the agency of individauls and their life choices ensure some degree of "loose coupling" between their actual social transition and life state in their timing of lives (Elder, 1996, p. 37). Therefore, even though all of grandparent caregivers are responsible for their grandchild, their life states and characterisitics can be different. The characteristics may includes age, marital status, education, income, public service use, health status, and the number and age of grandchildren.

Impacts of Grandparenting

A great deal of research has shown the physical, social, psychological, and economic consequences of becoming a grandparent caregiver. Several studies have showed that grandparenting is physically beneficial to grandparent caregivers in that grandparenting helps them to have active life style and healthier meals (Hayslip & Kaminski, 2005). Also, grandparents caregivers are likely to build a close relationship with their grandchildren and enhance their sense of purpose through caregiving tasks (Hayslip & Kaminski, 2005; Kropf & Yoon, 2006). At the same time, grandchildren also can get benefits from grandparenting, since they can stay with their family members, not should enter in welfare foster care system, when their parents are not able to raise them (Generations United, 2008b; Hayslip & Kaminski, 2005).

However, more studies have showed negative effects of grandparenting. Considering the physical aspects of grandparenting, Minkler and Fuller-Thomson (1999) found that custodial grandparents were significantly likely to report limitations in Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs), lower satisfaction with their health, and poorer self-reported health (see also Whitley, Kelley, & Sipe, 2001). In addition, grandparent

caregivers are more likely to have chronic diseases such as hypertension and diabetes (Solomon & Marx, 1999).

Considering psychological difficulties among caregivers, studies have shown that grandparent caregivers with extensive caring hours report more depressive symptoms and less life satisfaction than noncaregivers (Blustein, Chan, & Guanais, 2004; Goodman & Silverstein, 2005; Minkler & Fuller-Thomson, 2001). They are also likely to show increasing negative mood symptoms, especially in the case of grandmothers raising grandchildren with behavioral problems (Goodman & Silverstein, 2005). Grandmothers raising problematic grandchildren are likely to feel anxiety, shame, and guilty over their grandchildren's problems (Hayslip & Kaminski, 2005). In a study of different caregiver roles, grandparent caregivers reported higher rates of depression than caregivers for their spouses or adult-child (Strawbridge, Wallhagen, Shema, & Kaplan, 1997).

When it comes to the economic impacts, African American grandmother caregivers showed a higher rate of poverty than their counterparts did and they were more likely to live in overcrowded households (Minkler & Fuller-Thomson, 2005). Because many grandmothers give up working outside the home to raise a grandchild, they lose income and the tangible benefits of employment such as better health and less parenting stress (Generations United, 2008b). Moreover, grandparent caregivers are less likely to use public financial supports such as TANF and food stamps than non-caregivers (Minkler & Fuller-Thomson, 2005). Among caregivers, minority grandparents are especially likely to receive less financial assistance (Fuller-Thomson & Minkler, 2005, 2007)

In social aspects, Hughes, Waite, LaPierre, and Luo (2007) found that custodial grandparent caregivers experience greater disruption from their adult children's problems such as

substance abuse and incarceration. On the other hand, in the case of coparenting grandparents, they are likely to expereience role conflicts between them and their grandchildren's parents. Although custodial grandparents enjoy a close relationship with their grandpchildren, grandparent caregivers are likely to be isolated from their age peers because of caregiving burden and stress (Hayslip & Kaminski, 2005).

Household Structures and Grandprenting

Hayslip and Kaminski (2005) emphasize that attending to household composition differences among grandparents is vital to an accurate understanding for their circumstances and needs. The concept of household structure and circumstances of grandparenting are differently operationalized across studies, but most have consistently found that these influence the grandparent caregivers' well-being (Hayslip & Kaminski, 2005; Hughes, Waite, LaPierre, & Luo, 2007; Minkler & Fuller-Thomson, 2001).

Hughes, Waite, LaPierre, and Luo (2007) compared grandmothers in multi-generation housholds, in skipped generation households, and not in the same households with their grandchildren. They found that the effects of grandchild care on grandparents' health are contingent on the context and circumstances of that care: grandmothers caring for grandchildren in skipped-generation households would experience health declines, but grandmothers who babysit grandchildren in a different household may experience health benefits (Hughes, Waite, LaPierre, & Luo, 2007). Goodman and Silverstein (2002) compared custodial and coparenting grandparent caregivers across ethnic groups and found that receiving financial assistance is significantly related to custodial caregiving or coparenting status among African American caregivers . Minkler and Fuller-Thomson reported in their 2001 study that custodial or extensive care grandparents are more likely to experience functional limitations and depressive symptoms

than grandparents who are less responsible for their grandchild. Lastly, even though Hughes and Waite (2002) focused on general older adults including grandparents and their term *living arrangement* (marital status and co-residence with other family members) is a little different from the concept of household stuctures, their study also found that living arrangements are significantly related to self-related health, mobility limitations, and depressive symptoms in later life.

Race/Ethnicity and Grandparent Caregivers

Many researchers assert that the incidence of grandparents who are raising their grandchildren varies by ethnic groups and stress that effects of caregiving are related to race or ethnicity (Goodman & Silverstein, 2000, 2006; Hayslip & Kaminski, 2005). Goodman and Silverstein (2006) indicated that ethnic differences were evident for life satisfaction, negative effect, and positive effect among different ethnic grandmother caregivers. For example, African American grandmothers showed higher positive and lower negative effects of caregiving than White grandmothers (Goodman & Silverstein, 2006). Blustein, Chan, and Guanais (2004) also found that depressive levels are different across White, Black, and Hispanic grandparent caregivers.

Although it is clear that grandparent caregivers are at risk for poor health and well-being, the role that ethnic or racial background plays is less understood, which differentiates the impacts of caregiving on grandparents who step into this demanding family role (Goodman & Silverstein, 2006). Moreover, most of the attention has been focused on non-Hispanic White, African American and Hispanic grandparent caregivers, not on Asian American grandparents. The following sections explain cultural and historical background and current characteristics of grandparents from each ethnic group, including Asian American grandparents.

African American grandparents. African American grandparents are overrepresented as caregivers for their grandchildren. Nearly 700,000 African American adults report that they are responsible for one or more grandchildren, and this means that 10% of African Americans between age 55 and 64 take care of their grandchildren (Mutchler, Lee, & Baker, 2006a). This higher prevalence of grandparenting among African Americans may reflect a tradition of surrogate and extended family care going back to the time of slavery and its aftermath (Goodman & Silverstein, 2006). A strong grandparenting tradition arises from a history of shared parenting, the higher value placed on children, and the esteemed role of the grandmother who has endurance, wisdom, and spirituality (Hunter & Tayler, 1998). In addition, African American grandmothers have long played an important caregiving role in enabling young mothers to complete their education and/ or obtain a job (Minkler & Fuller-Thomson, 2005).

However, as Burton and Dilwork-Anderson (as cited in Goodman & Silverstein, 2006; Minkler & Fuller-Thomson, 2005) have noted, contemporary African American grandparent caregivers often assume their caregiving role in response to crisis, including the epidemics of substance abuse, female incarceration, and HIV/AIDS, which have been particularly severe in many low-income African American communities. Moreover, African American caregivers are more likely to be single and live with low income than White grandparent caregivers (Harper & Hardesty, 2001). This historical and contemporary backdrop provides an important context to explore current African American gradparents who are raising their grandchildren.

Asian American grandparents. Even though Asian American grandparents were less responsible for their grandchildren than African American and Latino grandparents, they are most likely to live with their grandchild in the same household (Mutchler, Lee, & Baker, 2006e). In addition, the Asian American Federation of New York (2003) reported that 35% of older

adults aged 65 or older in New York city engaged in caregiving of their grandchild. Asian American grandparents are more likely to be living in three generation households (76%) rather than skipped generation households, and more than 90% of the Asian American grandparent caregivers are foreign-born (Mutchler, Lee, & Baker, 2006b).

Few studies have examiend Asian American grandparents and their caregiving roles. Grandparents in Asian countries as well as in the United States play an active role in their three-generation households by helping with household work and child care (Kataoka-Yahiro, Ceria, & Caulfield, 2004). Kamo (1998) stressed cultural preference in the family is one reason of grandparenting in Asian Americans. Tam and Detzner (1998) studied 12 Chinese grandmothers and found child-rearing knowledge is highly valued, and grandparents were reported to be helpful in the development of ethnic identity. Chinese and Korean grandparent caregivers are likely to provide day care to their grandchildren without legal guardianship of primary responsibility while the children's parents are at work (Yoon, 2005). Sometimes, Asian American elders moved to the United States to perform childcare tasks for daughers or daughthers-in-law who work in a family business (Tam & Detzner, 1998; Yoon, 2005).

Hispanic grandparents. According to the 2000 Census, 425,000 Latino grandparents are responsible for one or more of those grandchildren, and they account 10% of grandparents in the United States (as cited in Mutchler, Lee, & Baker, 2006; Simmons & Dye, 2003). As with Asian American grandparents, many Latino grandparents are immigrants or foreign-born. Overall, 65% of the Latinos responsible for a co-resident grandchild are born outside of the United States (Mutchler, Lee, & Baker, 2006c).

Although caregiving involves apparent social stresses, their grandparent caregiving could be viewed as an aspect of familism – "putting family needs above individual needs"

(Goodman & Silverstein, 2006, p. 1608). Research on familism among Latino grandparents has demonstrated that they have more frequent contact with family and a stronger preference for living near family members than Whites do (Goodman & Silverstein, 2006). As a result, three-generation households appear more normative for Latino families than skipped generation households and are related to higher well-being among Latina grandmothers caring for grandchildren (Goodman & Silverstein, 2005). In their 2005 study, Goodman and Silverstein examined family functions and acculturation, indicating the capacity to participate in mainstream institutions of the host society, related to the Latina grandmothers' well-being. Their findings showed that the presence of the parents and family cohesion were related with the higher level of grandmothers' well-being. In addition, Spanish-preferred or less-acculturated grandmothers were less likely to assume care because of parental substance use and they are more likely to have their grandchildren's parents in their households. However, they were less close to their grandchild and more likely to have short years of education. As a result, the findings show the complicated roles of acculturation among immigrant Latina grandmother caregivers.

Non-Hispanic White grandparents. Although Whites are the group least likely to raise grandchildren, their absolute number of grandparent caregivers is much higher than other ethnic groups: over 1.1 million individuals are responsible for their grandchildren and they account for between 50% and 60% of all racial and ethnic grandparent caregivers (Kropf & Yoon, 2006; Mutchler, Lee, & Baker, 2006e). Moreover, White grandmothers are more likely to be burdened by the custodial role than African American grandmothers are, possibly because it is less normative for Whites than African Americans (Pruchno, 1999). Goodman and Silverstein (2006) also found that White custodial grandmothers show less life satisfaction and more depressive symptoms than African American and Latina grandmothers.

Race/Ethnicity and Household Structures

As mentioned above, different racial or ethnic groups have different cultural and historical backgrounds and show differences in prevalence and preference of household structures. Therefore, we also may expect to see racial and ethnic differences in the ways that various household structures affect health (Hughes & Waite, 2002).

Only a few studies have compared the grandparents based on both ethnicity and household structure (Goodman & Silverstein, 2002, 2006). Goodman and Silverstein (2002) compared coparenting and custodial grandparents among African American, Latino, and White groups and found that reasons for assuming care and exposure to stressful experiences were dramatically different for custodial and coparenting grandmothers. There were also differences of the impacts of copareting and custodial parenting among the three racial or ethnic group grandmothers. Their 2006 study consistently revealed that ethnic differences were different by household types. For example, Latina grandmothers reported higher well-being in coparenting circumstance than custodical parenting circumstances. On the other hand, African American grandmothers in custodial circumstances showed higher life satisfaction than their counterparts in coparenting circumstances.

Theoretical Model

Based on the literature review and theoretical framework, a theoretical model was created (see Appendix A). Characteristics of both grandparents and grandchildren influence grandparents' well-being in aspects of their physical, psychological, economical, and social status. Grandparents' characteristics include their demographics, such as age, gender and ethnicity, and caregiving status such as duration of caregiving and caregiving hours per week. Grandchild's characteristics cover their age, gender, and problematic behaviors. As outcome

variables, current studies have examined grandparents' physical health, psychological health, social circumstances, and economic status.

Research Questions

This study was aimed at examining the characteristics of grandparent caregivers from different races and different household structures, and exploring the influence of these two factors on their physical health and public service use through an examination of the following research questions:

1. What are the relationships among ethnicity, household structures, and grandparent caregivers' characteristics?

1-a. How do African American, Asian American, Latino, and White grandparent caregivers differ in terms of demographics, caregiving status, physical health, and the use of public income support programs?

1-b. How do grandparent caregivers in skipped generation households and three-generation households differ in terms of demographics, caregiving status, physical health, and the use of public income support programs?

1-c. How do African American, Asian American, Latino, and White grandparent caregivers living in skipped generation households and three-generation households differ in terms of demographics, caregiving status, physical health, and the use of public income support programs?

2. How do ethnicity and household structures affect the physical health of grandparent caregivers?

3. How do ethnicity and household structures affect public service uses of grandparent caregivers?

Actual (Analytic) Model

Based on the research questions and literature review, this study hypothesized that

1. Demographic characteristics, caregiving status, physical health status, and the use of public income support programs are different across African American, Asian American, Latino, and White grandparent caregivers in skipped generation households and three-generation households.

2. Physical health status is different across African American, Asian American, Latino, and White grandparent caregivers in skipped generation households and three-generation households.

3. The use of public income support programs is different across African American, Asian American, Latino, and White grandparent caregivers in skipped generation households and three-generation households.

To test these hypotheses, the actual model of this study focused on grandparent caregivers' physical health, the use of public income support programs, ethnicity and household structure as variables (see Appendix B). Physical health status variables included sensory limitation, medical conditions that limit physical activities, mental disability, limitation in ADLs, and functional limitation. The use of public income support programs included food stamps and any financial assistance or welfare payments from the state or local welfare office. Other demographics and caregiving status variables of grandparent caregivers were examined as control variables, and those included age, gender, marital status, immigrant status, education, employment, household income, overcrowded household, poverty status, and duration of caregiving.

Methodology

Data Description

The American Community Survey. The American Community Survey (ACS) is a survey conducted by the U.S. Census Bureau in every county, American Indian and Alaska Native Area, and Hawaiian Home Land. Taking the place of the decennial census long-form survey, the ACS provides critical economic, social, demographic, and housing information to this country's communities every year (Torrieri, 2007). The 1996 Welfare Reform Act mandates that statistics be collected on grandparents who are caregivers of a grandchild. In response to this requirement, questions were developed from the 2000 Census/ACS asking each adult about the care for grandchildren living in the same household. The 2000 Census and ACS are the only national datasets including information about Asian Americans' grandparent caregiving status.

The sample for the ACS was selected in each of the 3,141 counties and county equivalents in the United States, including the District of Columbia, and each of the 78 municipios in Puerto Rico. The national Master Address File (MAF) maintained by the U.S. Census Bureau is used as the source of addresses for the ACS. Based on the MAF, the ACS selected its sample through a two-phase, two-stage sample design.

After selecting the sample, the ACS data were collected in continuous, 3-month cycles using a combination of (1) Mailout/Mailback, (2) Computer Assisted Telephone Interview (CATI), and (3) Computer Assisted Personal Interview (CAPI) modes (U.S. Census Bureau, 2008a). In the first phase, a questionnaire was mailed to the sample address for the household to complete and return by mail. If no response by mail was received, the Census Bureau followed up with CATI if a telephone number was available for the address. If the Census Bureau was unable to reach an occupant of the unit using CATI, or if the household refused to participate, the

address might be selected for CAPI. The ACS achieved a high overall response rate of 95% through years of 2005 to 2007, due to the well-designed data collection method and mandatory survey participation by law. After the collected data went through a number of processing steps, they were ready to be released. Appendix C shows the overall flow of data as they pass from the data collection operations through data preparation and processing into data products. For more information about the ACS design and methodology, including sampling and data collection, see U.S. Census Bureau, 2006: http://www.census.gov/acs/www/Downloads/tp67.pdf

The Public Use Microdata Sample. Data from the 2005-2007 Public Use Microdata Sample (PUMS) was used in the study, which was introduced on December 2008 as the first ACS multiyear estimate. This estimate is based on data collected over a 3-year period and is published for selected geographic areas with populations of 20,000 or greater. The 2005-2007 PUMS data contains 3,830,606 housing unit records and 8,783,474 person records from households and 162,830 person records from group quarters. For information about sampling method, weighting, and errors in data, see the PUMS accuracy of the data 2005-2007: http://www.census.gov/acs/www/Downloads/2005-2007/AccuracyPUMS.pdf

The PUMS datasets were accessible with several data files: two population data files and two household data files. First, I concatenated two population data files and two household data files separately. Both concatenated population dataset and household dataset have SERIALNO, a unique individual identification number, which was used to merge population and household datasets. Since this study is only interested in White, African, American, Asian, and Hispanic grandparent caregivers, these respondents were selected from the merged dataset. Respondents were defined as grandparent caregivers if they replied “yes” to the following question: “Is this grandparent currently responsible for most of the basic needs of any grandchild(ren) under the

age of 18 who live(s) in this house or apartment?" The ethnicity variable of this grandparent caregiver sample will be discussed in the variable section. After the data were merged and the subjects were selected, the new dataset has 68,678 records (N) and 422 variables.

Measures

Several measures included in the ACS held special relevance for this study. The ACS asked for everyone aged 15 or over who lives in the household whether a person has any of his/her own grandchildren under the age of 18 living in the house or apartment.

Predictor variables. Ethnicity was coded into four dummy variables of White, African American, Asian American, and Hispanic. This variable was determined by two separate questions since Hispanic/Latino identity was asked separately in the ACS questionnaires. If individuals indicated that they are Hispanic/Latino, they are excluded from the next question, which asks about individuals' race. By the question of asking individuals' self-reported race, African American, Asian American, and White identities was determined. Asian Americans mean a summation of individuals who marked their race as "Asian Indian," "Chinese," "Filipino," "Korean," "Japanese," "Vietnamese," or "Other Asian". Since the ACS allowed individuals to mark more than one race, this study only included those who marked a single race and excluded those marking more than one race.

Household structure variables was dichotomized as skipped generation household and three-generation household. Since the ACS did not directly inform the household structures of grandparent caregivers, the household structures was determined indirectly by the question about a person's relationship with the householder. In cases of where a child's parent is the householder, the household means a three-generation household. In cases where a child's parent is not the householder, subfamily information about family relationship within households was used to infer a child's parents. If a child's parents were present, the household was a three-

generation household. On the other hand, if a child's parents were absent in the household, the household was a skipped generation household.

Control variables. Duration of caregiving was coded into five categories of (1) less than 6 months, (2) 6 to 11 months, (3) 1 or 2 years, (4) 3 or 4 years, and (5) 5 or more years. When it comes to demographics of grandparent caregivers, their gender was dichotomized as female and male. Marital status variable also had dichotomous categories, (1) married and (2) Non-married, which include those who were widowed, divorced, separated, or never married. Immigrant status was a dichotomous variable and was coded into American-born and Foreign-born. Employment status will be coded into dichotomous variables: (1) employed and (2) not-employed. Household income was based on a summation of income in the preceding 12 months for all household members. The sources of income included (a) wage, salary, commissions, bonuses, or tips from all jobs, (b) self-employment income from own nonfarm businesses or farm businesses, (c) interest, dividends, net rental income, royalty income, or income from estates and trusts, (d) Social Security or Railroad Retirement, (e) Supplemental Security Income (SSI), (f) Any public assistance or welfare payments from the state or local welfare office, (g) retirement, survivor, or disability pension, and (h) any other sources of income received regularly such as Veterans' payment, unemployment compensation, child support or alimony. The poverty index reported the household income as a percentage of the poverty level for households of that size and compositions. Since the ACS is a continuous survey, people respond throughout the year. Because the income questions specify a period covering the last 12 months, the appropriate poverty thresholds were determined by multiplying the base-year (1982) poverty thresholds by the average of the monthly inflation factors for the 12 months preceding the data collection (U.S. Census Bureau, 2008b). The poverty status was coded into three categorical levels based on the

poverty line: <100%, 100%-199%, and >200%. Although the Census Bureau has no official definition of crowded households, many users have considered households with more than one person per room to be crowded (U.S. Census Bureau, 2008b). This study also followed this definition for the overcrowded household variable. Lastly, completed education levels of grandparent caregivers was assessed as 16 categories in the ACS. For this purposed study, education level was coded into four categories: (1) < High school graduate, (2) High school graduate, (3) Some college, and (4) College degree or more.

Outcome variables. The use of public income support programs was determined by use of food stamps and public assistance or welfare payment (cash assistance) among individuals who were living below the poverty line. Health status was determined by several dichotomous variables on sensory limitations, medical conditions limiting physical activities, cognitive impairment, limitations in ADLs, and functional limitations. For variables of sensory limitations and medical conditions limiting physical activities, a person was asked whether he/she has long-lasting conditions related to these limitations. For the other health variables, a person was asked whether he/she has "any difficulty in doing learning, remembering, or concentrating" (cognitive impairment question), "dressing, bathing, or getting around inside the home" (limitations in ADLs question), and/or "going outside the home alone to shop or visit a doctor's office" (functional limitations question) because of a physical, mental, or emotional condition lasting 6 months or more.

Analysis Plan

Overall prevalence of grandparent caregivers in the United States was calculated by generating frequency analysis for a range of subgroups in terms of demographics, caregiving status, physical health status, and use of public income support programs (e.g. those who had not

completed high school and those who had cognitive impairment). The means of age and household income of all grandparent caregivers were also calculated. These descriptive analyses were replicated for four ethnic groups of grandparent caregivers, (1) Whites, (2) African Americans, (3) Asian Americans, and (4) Hispanics as well as two groups of them living in different types of household structures: (1) grandparent caregivers living in skipped generation households and (2) those living three-generation households. In addition to the separate analyses for four ethnic groups and groups from two different household structures, characteristics of White, African American, Asian American, and Hispanic grandparent caregivers within each of the household structures were also determined with respect to their demographics, caregiving status, physical health status, and the use of public income support programs.

To determine differences among the four ethic groups, between grandparent caregivers living in skipped generation households and three-generation households, and among the four ethnic groups within each household structure, chi-square tests, ANOVAs, and *t*-tests were conducted. Chi-square tests were used for categorical variables, and post-hoc Cramer's V tests were also conducted to determine the strength of associations between predictor and dependent variables. *t*-tests and ANOVAs were used for ratio level variables to examine the relationships of the variables to ethnic and/or household. To optimize the normal distribution of the values of household income variables, a square root transformation was performed and the transformed values were used in the bivariate analyses. Since Levene's test for Homogeneity of age variance revealed that four ethnic groups were not homogeneous in terms of their age, and the subsample sizes of ethnic groups are unbalanced, multiple comparisons procedures were used to control for the familywise error rate for ANOVAs.

In order to assess the independent contribution of ethnicity and household structure variables to physical health status and use of public income support programs while controlling for the other variables in the equation, it was necessary to conduct multivariate analyses. Logistic regression was used to examine the association of ethnicity, household structure, ethnicity by household structure interaction, or each demographic variable to each separate measure of the grandparent caregivers' physical health status (medical problems, cognitive impairment, limitations in ADLs, limitations in going out, and limitations in working) or use of public income support programs (public financial assistance and food stamps). Based on the literature review, the sensory limitation variable was excluded from the multivariate analysis because hearing or vision impairment did not seem be controlled by ethnicity or/and household structure in grandparent caregivers (Hayslip & Kaminski, 2005; Minkler & Fuller-Thomson, 1999). Having limitations or problems in each health variable was coded 1 as well as receiving food stamps and public financial assistance was coded 1. In each logistic regression, sequential three models were conducted. The first model was built to examine the grandparent caregivers' health status and service use in relation to ethnicity and household structure separately (Model 1). In the second model, ethnicity by household structure interaction variables were added (Model 2). Finally, demographic variables and the caregiving duration variable were also introduced to identify the role of these exigent factors on the grandparent caregivers' health and use of public income support programs (Model 3, age, gender, marital status, nativity, education, employment, overcrowded household, poverty, and caregiving duration).

Results

Overall Characteristics of Grandparent Caregivers

As indicated in Table 1, the mean age of the sample of grandparent caregivers were 56.51 years (*SD*=9.96) while their mean household income was $ 61,655.37 (*SD*=53051.43).

[Table 1]

Table 2 presents characteristics of the sample with categorical variables. Of the total sample of 68,678 grandparent caregivers, 63.07% were Whites (*n*=43,314), 24.61% were African Americans (*n*=16,905), 2.99% were Asian Americans (*n*=2,053), and 9.33% are Hispanics (*n*=6,406). Proportion of male was 37.86% and that of female was 62.14%. Of grandparent caregivers, 68.98% were married and 31.02% were unmarried while 89.53% were American-born and 10.47% were foreign-born. When analyzed by education, 26.39% of grandparent caregivers had not been completed high school, 36.24% of them had graduated high school, 26.60% of them had attended college for some years, and 10.78% of them had gotten college degree or higher degree. Of the total sample, 54.26% were employed while 45.74% were not employed. 88.53% of grandparent caregivers were living in households, which have the number of rooms equal to (or less than) the number of persons, but rest of them was not. 17.19% of grandparent caregivers were living below poverty line, 57.41% were living over 200% of the poverty line, and 25.41% were living between poverty line and 200% of the poverty line.

[Table 2]

In terms of caregiving circumstances of grandparent caregivers, 48.11% of grandparent caregivers took care of their grandchildren in skipped generation households while 51.89% of them did in three-generation households. 11.25% had been caregiving for < 6 months, 10.16% had provided care for 6 to 11 months, 23.37% for 1 or 2 years, 16.71% for 3 or 4 years, and 38.51% had been raising grandchildren for equal to or longer than 5 years.

Regarding physical health status of grandparent caregivers, 7.89% had vision or hearing problems, one of every four grandparent caregivers (23.33%) had medical problems limiting their physical activities, 8.63% had cognitive impairment, and 5.97% had difficulty in dressing, bathing, or getting around inside the home. Also, 8.00% had difficulty in going outside the home alone, and one in every five grandparent caregivers (19.42%) had difficulty in working at a job or business. Among those who are living below the poverty line, approximately one in every 15 grandparent-caregivers received public financial assistance (6.48%) while one in every 10 individuals received food stamps (9.73%).

Ethnic Differences in Grandparent Caregivers' Characteristics

Demographics and Caregiving Status. Demographics and caregiving status are shown in Table 3 for grandparent caregivers from each ethnical background. The result of a series of chi-square tests revealed that significant differences existed across Whites, African Americans, Asian Americans, and Hispanics by their gender (χ^2 (3)= 996.76), marital status (χ^2(12)= 6602.26), immigrant status (χ^2(3)=29758.65), education (χ^2(9)= 4081.88), employment (χ^2(6)=425.62), overcrowded (χ^2(3)=3490.60), poverty status (χ^2(6)= 3772.00), duration of caregiving (χ^2(12)= 395.23), and household structure (χ^2(3)= 590.71) at the *p*-value of <.0001. African American grandparent caregivers were most likely to be female, not married, and living below the poverty line while Hispanics were most likely to be less educated with the lowest rate of college graduation among the four ethnic groups. African American grandparents had the highest rate (44.46%) of five or more years of caregiving duration while Hispanic grandparents had the highest rate (13.32%) of less than six months of caregiving duration among the four ethnic groups. Asian American and Hispanic grandparent caregivers were more likely to take

care of their grandchildren in three-generation household than their White and African American counterparts.

[Table 3]

Since statistical significance in all relationships was likely to be caused by very large sample sizes, post-hoc Cramer's V tests were also conducted to determine the strength of associations between ethnicity and other categorical variables. The result revealed that ethnicity is more strongly associated with marital status, immigrant status and overcrowded status than any other variables in the level of .24, .66 and .23 respectively. Specifically, Asian American grandparent caregivers are most likely to be foreign-born and live in overcrowded household.

The age of grandparent caregivers was significantly related to their ethnical backgrounds, $F(3)=155.81$, $p<.0001$. Specifically, Asian Americans were more likely to be older ($M=60.28$) while Hispanics were likely to be younger ($M=54.92$) than Whites were ($M=56.59$), respectively. However, the mean age of African Americans ($M=56.43$) was not significantly different from that of Whites. Asian American grandparent caregiver households earn the largest amount of income ($94,119.58) followed by Whites' households ($67,004.46), Hispanics' households ($55,038.26), and African Americans' households ($46,507.72), with significant differences across four groups, $F(3)=1248.76$, $p<.0001$.

Physical Health Status. All variables of physical health status showed significant ethnic differences at the *p*-value of <.0001 except the sensory limitation variable which showed the difference at the *p*-value of .0001. Whites had the highest rate of having sensory limitations with 8.14% ($\chi^2(3)= 20.28$) while African Americans had the highest rate of having limitations in ADLs with 7.84% ($\chi^2(3)=172.03$), working with 23.18% ($\chi^2(3)=295.23$), and going out with 10.03% ($\chi^2(3)=139.10$), and suffering from cognitive impairment with 10.63% ($\chi^2(3)=118.94$)

and one or more medical problems with26.60% ($\chi^2(3)= 298.84$). However, the results of post-hoc Cramer's V tests revealed that the strength of association between ethnicity and all measures of physical health status are less than .10.

Public Income Support Programs. Bivariate analyses of the use of the public income support programs showed receiving public financial assistance to be highest for the impoverished Asian American grandparent caregivers (10.15%), followed by the African Americans (8.56%). African Americans also showed highest rate of receiving food stamps (11.84%). Both variables were significantly different across ethnic groups, $\chi^2(3)= 67.28$, $p<.0001$ for public financial assistance and $\chi^2(3)= 43.56$, $p<.0001$ for food stamps. However, the results of Cramer's V tests revealed that the levels of strength of association between ethnicity and use of two programs were less than .10.

Differences of Household Structures in Grandparent Caregivers' Characteristics

Demographics and Caregiving Status. Demographic and caregiving status factors describing grandparent caregivers showed differences in household structures consistently (see Table 4). The result of a series of chi-square tests revealed that significant differences existed between grandparent caregivers living in skipped generation households and three-generation households in regards of their gender ($\chi^2(1)= 30.08$), marital status ($\chi^2(1)= 54.09$), immigrant status ($\chi^2(1)=556.10$), education ($\chi^2(3)= 132.41$), employment ($\chi^2(1)=1153.59$), overcrowded household status ($\chi^2(1)=3046.94$), poverty status ($\chi^2(2)= 525.64$), and duration of caregiving ($\chi^2(4)= 3227.70$) at the *p*-value of <.0001. Grandparent caregivers living in skipped generation households had higher rates of female, not married and American-born. They were more likely to be less educated, have jobs or run business, live below the poverty line, and take care of their grandchildren for longer periods. On the other hand, grandparent caregivers in three-generation

households had greater portion of ones who lived in overcrowded households. Post-hoc Cramer's V tests were also conducted to determine the strength of associations between household structure types and other categorical variables. The result revealed that household structure is more strongly associated with duration of caregiving, overcrowded status, and employment status than any other variables in the level of .24, .23, and .13 respectively.

[Table 4]

There were statistically significant differences in the mean years of age between grandparent caregivers living in two household structures, t (69E3) = 55.35, p<.0001. The mean age of caregivers in skipped generation households was significantly higher than that of caregivers in three-generation households. Grandparent caregivers in skipped generation households earned less income than their counterparts in three-generation households, t (69E3) = -58.57, p<.0001.

Physical Health Status. All variables of physical health status showed significant ethnic differences at the p-level of <.0001 except the sensory limitation variable at the p-level of .0001. Grandparent caregivers who took care of their grandchildren in skipped generation households had higher rates of sensory limitations with 8.62% ($\chi^2(1)= 46.53$), limitations in ADLs with 6.67% ($\chi^2(1)=55.87$), limitations in going out with 8.95 ($\chi^2(1)=76.74$), and limitations in working with 22.69% ($\chi^2(1)=432.97$). They also showed higher rates of suffering from cognitive impairment with 9.60% ($\chi^2(1)=76.17$) and having one or more medical problems with 26.52% ($\chi^2(1)= 361.89$) compared to their counterparts living in three-generation households. However, the results of post-hoc Cramer's V tests revealed that the strength of association between household structure and all measures of physical health status were less than .10.

Public Income Support Programs. Bivariate analyses of the use of the public income support programs showed receiving public financial assistance to be higher for grandparent caregivers in skipped generation households (7.22%) while receiving food stamps to be higher for ones in three-generation households (11.63%). Both variables were significantly different between two groups of grandparent caregivers with $\chi^2(1)= 14.69$, $p<.0001$ for public financial assistance and $\chi^2(1)= 35.97$, $p<.0001$ for food stamps. However, the results of Cramer's V tests revealed that the levels of strength of association between household structure and use of two public income support programs were less than .10.

Characteristics of Different Ethnic Groups of Grandparent Caregivers by Household Structure

Demographics and Caregiving Status. Bavariate analyses of demographics and caregiving status variables showed significant ethnic differences regarding all variables in both household structures (see Table 5). Age of grandparent caregivers was significantly related to their ethnicity, $F(3)= 41.39$, $p<.0001$ in skipped generation household and $F(3)= 128.57$, $p<.0001$ in three-generation household. Asian Americans were oldest among four ethnic groups in both types of household structures. Asian Americans also showed the highest rate of foreign-born in both family types, followed by Hispanics, $\chi^2(3)= 13131.69$, $p<.0001$ in skipped generation household and $\chi^2(3)=16161.18$, $p<.0001$ in three-generation household. African American grandparent caregivers had the lowest proportion married in both family types, $\chi^2(3)= 2096.31$, $p<.0001$ in skipped generation household and $\chi^2(3)=2138.98$, $p<.0001$ in three-generation household. Household income of grandparent caregivers was significantly related to their ethnicity, $F(3)= 596.91$, $p<.0001$ in skipped generation household and $F(3)= 707.26$, $p<.0001$ in three-generation household. African Americans showed higher poverty rates in both family types, $\chi^2(6)= 2096.31$, $p<.0001$ in skipped generation household and $\chi^2(6)=2138.98$,

$p<.0001$ in three-generation household. White grandparent caregivers had the highest proportion of being employed, whereas Asian Americans had the lowest proportion in both skipped generation household ($\chi^2(3)= 241.18$, $p<.0001$) and three-generation household ($\chi^2(3)= 123.34$, $p<.0001$). Hispanic grandparent caregivers had the lower educational level than other groups in both households, $\chi^2(9)= 1269.84$, $p<.0001$ in skipped generation household and $\chi^2(9)=3012.92$, $p<.0001$ in three-generation household.

[Table 5]

Gender, overcrowed household status, and duration of care showed slightly different aspects in two different types of household structures. In skipped generation households, African American grandparent caregivers had the highest proportion of female while White had the lowest one with significant differences, $\chi^2(3)= 520.57$, $p<.0001$. In three-generation households, African Americans also had the highest proportion of female, but Asian Americans had the lowest one with significant differences, $\chi^2(3)= 517.20$, $p<.0001$. Overcrowded household status also showed significant differences among ethnic groups in skipped generation household ($\chi^2(3)= 1317.87$, $p<.0001$) and three-generation household ($\chi^2(3)= 1900.52$, $p<.0001$). Higher proportions of Asian American and Hispanic grandparent caregivers lived in overcrowded household compared to Whites and African American Households. Between Asian Americans and Hispanics, Asian Americans had the higher proportion in skipped generation household whereas Hispanics had the slightly higher one in three-generation household. Lastly, African American grandparent caregivers took care of their grandchildren for significantly longer periods in skipped generation household ($\chi^2(12)= 204.07$, $p<.0001$.) while Asian Americans did in three-generation household ($\chi^2(12)= 219.25$, $p<.0001$) based on less or more than one year of caregiving.

Physical Health Status. In skipped generation household, differences across ethnic groups were significant by medical problems ($\chi^2(3)= 92.51$, $p<.0001$), cognitive impairment ($\chi^2(3)= 124.69$, $p<.0001$), limitations in ADLs ($\chi^2(3)= 108.28$, $p<.0001$), limitations in going out of home ($\chi^2(3)= 95.88$, $p<.0001$), and limitations in working ($\chi^2(3)= 124.47$, $p<.0001$). African American grandparent caregivers had higher proportions of having medical problems, cognitive impairment limitations in ADLs, and limitations in working compared to White, Asian Americans, and Hispanic counterparts. On the other hand, Asian Americans had higher proportion of having limitations in going out of home. There was no significant difference in having sensory limitation within four ethnic subgroups.

In three-generation household, differences of ethnic groups by medical problems ($\chi^2(3)= 156.90$, $p<.0001$), cognitive impairment ($\chi^2(3)= 34.72$, $p<.0001$), limitations in ADLs ($\chi^2(3)= 517.20$, $p<.0001$), limitations in going out ($\chi^2(3)= 59.80$, $p<.0001$), and limitations in working ($\chi^2(3)= 158.46$, $p<.0001$) were significant. African American grandparent caregivers had higher proportions of having medical problems, cognitive impairment limitations in ADLs limitations in going out and limitations in working compared to White, Asian Americans, and Hispanic counterparts. On the other hand, Whites had the highest proportion of having sensory limitations followed by African Americans with significant differences across four ethnic groups, $\chi^2(3)= 24.39$, $p<.0001$.

Public Income Support Programs. The results of bivariate analyses showed that impoverished African Americans and Asian Americans are more likely to receive the public financial assistance than Whites and Hispanics. Specifically, Asian American grandparent caregivers showed the highest rate of recipients in skipped generation households (12.96%), whereas African Americans showed the highest rate in three-generation household (7.52%).

Differences of use of food stamps were also significant in skipped generation household ($\chi^2(3)= 16.28$, $p<.0001$) and three-generation household ($\chi^2(3)= 30.57$, $p<.0001$). African Americans showed the highest rate of receiving food stamps followed by Whites in both types of households.

Ethnic and Household Differences in Grandparent Caregivers' Health and Service Use

Ethnicity, Household Structure, and Health. Table 6 presents the results of logistic regression analyses for each measure of physical health status. Each health status measure continuously showed ethnic differences in three models, and ethnic effects were especially evident for medical problems which limit physical activities. However, ethnic effects were not sustained in the same direction from Model 1 to Model 3 with the addition of interaction of ethnicity by household type, demographic and caregiving duration characteristics. In comparison of White grandparent caregivers, African Americans' odd of having medical problems was 19% higher in Model 1, but the odd was 18% lower in Model 3, once demographic and caregiving duration factors were controlled. As well as having medical problems, the odds of having cognitive impairment and limitations in working were 35% and 29% higher respectively for African American grandparent caregivers in Model 1, whereas the odds were 13% and 17% lower respectively in Model 3.

[Table 6]

Household structure differences were evident for every measure of health status including medical problem, cognitive impairment, limitation in ALDs, limitation in going out, and limitation in working, and were sustained in Model 2 and 3. However, household structure differences shifted with controls: Once all of demographic and caregiving duration factors adjusted, caregiving in skipped generation household was related to positive effects on health. Before these factors were controlled, the odds of having medical problems, cognitive impairment,

limitations in ADLs, limitations in going out and limitations in working for skipped generation household were 38% (31%), 26% (17%), 24% (13%), 27% (17%) and 47% (37%) higher respectively in Model 1 (Model 2). These shifts in household structure and being African Americans suggest that grandparent caregivers' demographics, such as gender, education, employment and household income, are compelling determinant of health of African American grandparent caregivers and caregivers in skipped generation household.

Differences in ethnicity by household structure interaction were sustained in Model 3 after this variable was once added in Model 2. Even though Asian Americans living in skipped generation household did not show significant differences from Whites living in skipped generation household for each measure of health status, Hispanics living in skipped generation household showed 30% higher odd of having medical problems, 36% higher odd of having cognitive impairment, 53% higher odd of having limitations in ADLs, 50% higher odd of having limitations in going out, and 50% higher odd of having limitations in working, once all of demographic and caregiving duration factors adjusted in Model 3. When compared to White grandparent caregivers who had taken their grandchildren in skipped generation household, African Americans living in skipped generation household showed 12% higher odd of having cognitive impairment, 25% higher odd of having limitations in ADLs, and 18% higher odd of having limitations in working.

All demographic and caregiving duration factors predicted one or more measure(s) of health status, even though relationship between overcrowded household status and health was marginally significant only for medical problem ($p<.01$). Poverty status, education, household income, and foreign-born status were particularly related to health status across all measure of health status. In compared to grandparent caregivers living over 200% of poverty line, those

living below poverty line had 45% higher odd of having medical problem. Grandparent caregivers who were not employed had more than 400% higher odds for every measure of health status. Foreign-born grandparent caregivers and > high school graduate grandparent caregivers showed overall positive health status compared to American-born and <high school education counterparts, respectively.

Ethnicity, Household Structure, and Use of Public Programs. Table 7 presents the results of logistic regression analyses for the use of public financial assistance programs and food stamps. Difference between Whites and African Americans was evident for receiving public financial assistance and food stamps in Model 1 and sustained in Model 2 and 3. Once other factors were controlled in Model 3, more African Americans had received financial assistance (odd ratio[OR]=1.91) and food stamps (OR=1.35) than Whites. Grandparent givers in skipped generation households had significantly higher odds for receiving financial assistance while lower odds for receiving food stamps than those in three-generation households across three models except Model 3 of public financial assistance.

Interaction of ethnicity by household structure was not significant across two measures of the use of public income support programs. Gender, marital status, and household income predicted whether grandparent caregivers received public financial assistance or not. Grandparent caregivers who had received financial assistance 36% higher for being non-married and 24% lower for female. On the other hand, being younger, being non-married, being American-born, achieving lower education level, household income, and living in overcrowded household were focal for receiving food stamps.

Discussion

In these analyses, the study examined the characteristics of grandparent caregivers from different ethnicities and household structures, and explored the influence of these two factors on their physical health and the use of public income support programs. In addition to the use of recently released national data, this study was unique in its inclusion of the Asian American population as one of the ethnic grandparent caregiver groups and its focus on both ethnic and family structure differences among grandparent caregivers. Due to these strengths, this study shed light on the differences of Asian Americans from other ethnic groups and their uniqueness when compared with other groups. Examining ethnicity, household structure, and the two factors' interaction improved understanding for grandprarent caregivers in spite of the complexity of grandparenting circumstances (Phua & Kaufman, 2008).

Different Demographics among Ethnic and Household Structure Groups

As was hypothesized, this study found that White, African American, Asian American, and Hispanic grandparent caregivers were significantly different in terms of their age, portion of each gender, marital status, immigrant status, education, employment, household income, overcrowded household status, poverty status, duration of caregiving and household structure. Whether grandparent caregivers had taken care of their grandchildren in skipped generation households or in three-generation households were also associated with these different demographic characteristics and caregiving status.

Regarding most grandparent caregivers' demographics and caregiving status, ethnic groups showed similar patterns in each household structure. Consistent with previous literature, Asian Americans and Hispanics were more likely to be foreign-born (Mutchler, Lee, & Baker,

2006b; 2006c), and African Americans were the most financially vulnerable group followed by Hispanics (Harper & Hardesty, 2001).

Even though Asian American grandparent caregivers were generally advantageous in terms of their better economic status and shorter period of caregiving, they were discriminated in several dimensions. Considering education, Asian Americans showed the highest rates of less than high school graduation (the lowest education category) and higher than college degree, which is the highest education category, at the same time. This finding suggests that Asian American grandparent caregivers are tremendously heterogeneous in their education level, and this may influence their heterogeneity in their socio-economic status, too. Other statistical studies also support this argument that Cambodians, Hmong, and Laotians have the highest rates of having less than high school education and the lowest score of Socioeconomic Index (SEI) compared to other ethnic groups even including African Americans and Hispanics (Le, 2009).

Asian Americans were also most likely to be older than the other ethnic grandparent caregivers. Even though the ACS survey did not ask participants about the reasons for caregiving responsibility (Burton, 1996), this might be partly because Asian American grandparents took responsibility for their grandchildren caregivng for different reasons from other ethnic groups. Substance abuse, HIV/AIDS, incarceration, and teen pregnancy were the most prevalent circumstances under which grandparents assume the primary caregiving responsibility, based on studies with White, African American, and Hispanic grandparents (Kropf & Yoon, 2006). These circumstances of children's parents are likely to cause "early non-normative" and "early normative" grandparenting (Burton, 1996). On the other hand, Asian American elders mostly take care of their grandchildren for children's parents who work in a family business (Yoon, 2005), which could be interpreted that the parents are older enough to their own business.

On the other hand, several demographic factors showed different patterns in each household structure and these differences may influence differently grandparent caregivers in terms of household structure. For example, since familism and multigenerational household structure are cultural traditions for Asian American and Hispanic grandparent caregivers, and non-married grandparents are more economically vulnerable and feel more caregiving burden than those who are married (Hayslip & Kaminski, 2005; Minkler & Fuller-Thomson, 1999), non-married Asian American and Hispanic grandparent caregivers may need greater support.

Different Health Status among Ethnic and Household Groups

Health status was different across different ethnic groups and grandparent caregivers living in different household types. In the bivariate analysis, in general, African Americans were most likely to have limitations in their health compared to three other ethnic groups, and caregivers in skipped generation households showed more negative health status than those in three-generation households regarding all health status variables. These results are consistent with findings from the previous studies with different ethnic grandparents in skipped- and three-generation households (Hughes & Waite, 2002; Kataoka-Yahiro, Ceria, & Caulfield, 2004). However, inconsistent with two studies of Goodman and Siverstein (2005, 2006), which examined grandparent caregivers' mental health, such as life satisfaction and depression, health status measures examined in this study showed similar patterns across ethnic groups in two types of household structures.

Even though higher rates of health limitations in African Americans and grandparent caregivers living in skipped generation households were evident at the bivariate level, these negative aspects were positively shifted when their demographic and caregiving duration factors were controlled. This finding suggests that grandparents' demographic and socio-economic

characteristics, rather than ethnicity and household structure, are significant factors in their health status. In other words, demographics and socio-economic factors may make African American grandparents and those who live in skipped generation households vulnerable. The result also should be interpreted in a culturally sensitive way for Asian Americans and Hispanics. Even though the statistical significance in Model 1 was attenuated in Models 2 and 3, Asian Americans, who have better health status in medical condition, cognitive ability, ADLs, and work ability, showed higher limitations only in going out than other ethnic grandparent caregivers. This health problem, as well as cultural and linguistic barriers, might make them more isolated from society and discourage them from accessing health care services available to them (Montgomery County Department of Health and Human Services, 2005). In addition, when considering the interaction of ethnicity by household structure, Hispanics in skipped generation households continuously showed higher limitations in health compared to Whites in the households, even after controlling other grandparents' characteristics. This finding is consistent with previous studies in that Hispanic grandparent caregivers showed less well-being in skipped generation households than those in three-generation households, since they normalize three-generation households based on their cultural preference in the family (Goodman & Silverstein, 2005). Further, the higher health limitations among Hispanics in skipped generation households could be more of a burden to them since Hispanic grandparent caregivers are more likely to take care of younger grandchildren who need "hands-on" care and assistance requiring physical movements than African American and White peers (Mutchler, Lee, & Baker, 2006e).

Although the relationship of grandparent caregivers' demographics and socioeconomic status to their health are not focuses of this study, several factors showed important results. In this study, non-married, less-educated and financially insufficient grandparent caregivers showed

worse health than their counterparts. Based on findings of Hughes and Waite (2002) that impoverished grandmothers with mobility limitations were less able to meet the demands of grandchild care and non-married grandparents had fewer resouarces for caregiving, their negative health status may increase difficulties of caregiving. On the other hand, this study did not indicate that overcowding was associated with limitations in health among grandparent caregivers, even though Minkler and Fuller-Thomson (2005) suggested overcrowding as one of the threatening factors against grandparents' ability, which is often interconneted with proverty and functional limitations. When considering that the sample of the study of Minkler and Fuller-Thomson (2005) was only African American grandparent caregivers, overcrowding effects on grandparents' health may differ across ethnic groups by their cultural tradition (Kataoka-Yahiro, Ceria, & Caulfield, 2004).

Different Use of Public Income Support Programs

In terms of the use of public income support programs, the proportions of recipients of each program were significantly different across the ethnic groups. In multivariate analysis with controlling grandparents' other characteristics, African Americans continuously had a higher rate of food stamps and financial assistance recipients. The use of public assistance often reflects increased knowledge of and access to public programs (Cunnyham, 2004). Therefore, African Americans appear to be better aware of food stamps than the other ethnic grandparent caregivers and financial assistance programs than Whites. This interpretation is also supported by the finding of Cunnyham's (2004) food stamps participation report in which African American eligible households showed the highest participation rate of the program among food stamps eligible households with different ethnicities. Otherwise, the different use of food stamps among ethnic groups may relate to the willingness to participate in the program. The use of food stamps

in public is often perceived as a welfare stigma, and this perspective may be different from ethnic group to ethnic group (Fuller-Thomson & Redmond, 2008). According to this interpretation, White grandparent caregivers are most likely to feel the stigma against their use of public welfare or financial assistance programs.

On the other hand, the higher rate of recipients of public financial assistance among Asian Americans also can be interpreted as another example showing Asian Americans' huge heterogeneity in terms of their origins or immigrant status (Le, 2009). Even though Asian Americans as a whole group showed the highest level of income and accounted for the least portion of people living in poverty on average, they also showed the broadest range of income among all ethnic groups. Therefore, the significantly higher rate of recipients of assistance might come from the significant portion of those in need of the assistance among Asian Americans.

Household structure also was significantly associated with the recipients of food stamps and public financial assistance. However, in contrast to our expectation, public use of these two types of programs showed opposite use patterns: Grandparent caregivers in skipped generation households were more likely to receive financial assistance, whereas those in three generation households were more likely to receive food stamps. Since larger families have greater needs and qualify for more support, three-generation households with larger numbers of family members might be more likely to receive food stamps (Gensler, 1995/96). Perhaps the findings of lower rates of public financial assistance recipients among three-generation household cohorts may be due to the fact that one of the main cash assistance programs, Temporary Assistance for Needy Families (TANF), requires employment to work-eligible household members younger than age of 65, who may be children's parent generation (Generations United, 2008b). This fact might cause some grandparent caregivers in three-generation households to be not eligible for cash

assistance programs including TANF. The fact that non-employed and female grandparent caregivers showed lower recipient rates of financial assistance programs than their counterparts also supports this interpretation.

Limitations

Even though the findings are informative, it should be noted that the study has limitations in spite of many advantages over previous studies. First, because of the cross-sectional nature of research design, we can only know associations and cannot determine which factors were causally related to grandparent caregivers' health and service use. Second, only 2.99% for Asian Americans and 9.33% for Hispanics were included in the sample while over 63% were White grandparent caregivers. The unbalanced sample size among ethnic groups could influence statistical significance, even though several statistical adjustments were applied to the tests.

Third, several limitations are imposed on the ACS data. Even though the ACS data is nationally representative, contrary to the US Census data, the 3-year estimate ACS collected data from only selected geographic areas with populations of 20,000 or greater. This geographic limitation should be noted since grandparent caregivers were slightly more likely to live in rural areas than their non-caregiver peers and geographic region may be a factor to be associated with grandparents in their late age (Elder, 1996; Fuller-Thomson & Minkler, 2007; Minkler & Fuller-Thomson, 2005). In addition, when individuals identified themselves as grandparent caregivers who are responsible for most of the basic needs of any grandchild(ren), the ACS did not ask them how extensively they provided care to their grandchildren and which type(s) of needs they are responsible for. Caregiving extensiveness, not only caregiving duration, should be a control variable since it is closely related to grandparent caregivers' health status (Minkler & Fuller-Thomson, 2001). As Phua, Kaufman and Park (2001) suggested that grandparenting can be

manifested as an economic exchange and be culturally specific, how grandparents manifest "responsibility" as grandparent caregivers should have been examined. In other words, if grandparents' responsibility was restricted to financial support, their health status might not be correlated with grandparenting. On the other hand, if they are only responsible for daily care for their grandchildren and children's parents entirely assume the financial responsibility, their use of public income support programs might not be related to grandparenting. This issue especially would emerge in three-generation households.

Lastly, the ambiguousness of some measures should be indicated, too. Since the ACS did not directly ask the identity of each child's parent in the household, based on a series of studies of Mutchler, Lee, and Baker (2006), subfamily information provided by the ACS data about family relationships within households was used to infer the presence of a child's parents to figure out skipped- and three-generation households. However, due to its indirect categorization, for an unknown number of cases, "three-generation" households may include the grandchild's aunt or uncle rather than the child's parent as the middle generation. In addition, grandparent caregivers did not take existing health status tests, but self-reported their health status whether they have limitations in function or medical problems. However, their health limitations might be underreported since grandparents tend to play down their personal health problems. For example, Minkler, Roe and Price (1992) revealed that most grandmothers downplayed their health problems and refused to dwell on their symptoms.

Implications for Practice, Policy, and Research

The findings showed significant differences of socioeconomic status, health, and the use of public income support programs across ethnic groups and their household structures. This may

be translated into needs of culturally competent practice with grandparent caregivers in terms of outreach, emphasis, and specific goals for intervention.

Health practitioners working with grandparent caregivers need to outreach at-risk groups of grandparent caregivers in terms of ethnicity, household structure, and socio-economic status. As ethnicity and household structure are potentially powerful moderators, demographics and socio-economic factors may make African American grandparents and those who live in skipped generation households vulnerable. Therefore, health disparities across different ethnic groups and household structure groups could be eliminated by supporting their living situation and economic resources as well as promoting their health itself. According to this perspective, case management for grandparent caregivers and their families would be effective. Even though Project Healthy Grandparents, one of the community-based case management programs, has focused broadly on quality of life rather than health, it was revealed as an effective program for grandparent caregivers by providing grandparents and grandchildren with comprehensive services and improved access to community resources (Project Healthy, 2008). With an emphasis on supporting each individual, community development for ethnic groups is also needed in that African Americans and Hispanics are more likely than Whites and Asian Americans to be impoverished and to live in distressed communities, with correspondently fewer resources and more difficult environments for raising children (Hughes et al., 2007).

In addition, a culturally sensitive approach is also needed for health intervention. Limitation in going out especially may make Asian Americans more isolated from the society in addition to their language barriers and immigrant status (Le, 2009; Yoon, 2005). For this reason, regardless of whether Asian Americans' highest rate of the limitation was derived from their actual health status or their perception, practitioners should consider whether the grandparents

are more isolated from the society due to their health limitations in assessment. Also, Hispanic grandparent caregivers living in skipped generation households are especially needed for outreach and provided with more resources and programs for improving their more vulnerable health status. When considering Hispanics' familism and an absence of alternative caregivers for children in skipped generation households, health clinics and services for families rather than individuals should be made easily accessible (Kataoka-Yahiro et al., 2004; Minkler & Fuller-Thomson, 1999).

The different rate of recipients of public income support programs among ethnic groups and families living in different household structures underscores the importance of appropriate outreach and budget allocations to ensure that vulnerable caregivers receive the support needed for themselves and the children in their care (Minkler, & Fuller-Thomson, 2005). Even though the Personal Responsibility and Work Opportunity Act of 1996, which established TNAF in 1997, has mandated work requirements and time limits for welfare, the work requirement has been more rigid since the 2006 reauthorization. However, when considering the findings that not-employed status was significantly related to more severe health limitations and about one fifth of grandparent caregivers had limitations in working, the rigid work requirement would make adverse effects on grandfamilies and should be considered to be reformed (Generations United, 2008a; Goodman & Silverstein, 2002). Moreover, that requirement makes grandparent caregivers in need more vulnerable. For example, grandparent caregivers who live in skipped generation household are especially need welfare payment based on their lower economic status, but they are more likely to have limitations in work.

Through a lens including of diverse ethnic groups and with the use of a large representative sample, important variations regarding health, service use, and socioeconomic

status in grandparent caregiving by ethnicity and household structure become apparent. However, this paper suggests that further research effort must be made to provide more extant knowledge for assisting diverse grandparent caregivers. Changes in current income support programs should be considered based on the more in-depth studies regarding different use patterns between food stamps and public financial assistance programs by ethnic groups and different household groups. Further research to examine the use of public programs among grandparent caregivers should consider state level variances as well as individual factors such as ethnicity and household structure in order to interpret exactly the pattern of program recipients. Also, health status of grandparent caregivers should be examined by existing valid health examinations, not by self-report, to examine actual health status rather than individuals' perception of their health status. The evidence that many of the grandparents caring for their grandchildren tend to have a high sense of perseverance and determination to continue their responsibilities in spite of their physical limitations and symptoms (Minkler & Fuller-Thomson, 1999) indicates the need to examine the factors which change or sustain health disadvantages. Such research will ultimately require new data collection. Although the ACS data set provided a unique opportunity to examine diverse ethnic grandparent caregivers as only nationally representative data that identify diverse ethnic groups, including Asian Americans, the data do not collect detailed information about health status of respondents including grandparent caregivers. This limitation suggests the need for a representative study of grandparent caregivers from diverse ethnicities and detailed information about health. Finally, the small size of the Asian American sample indicates the need for separate and in-depth study only for Asian American grandparent caregivers and the heterogeneity of the group suggests the avenue of comparative studies for Asian American groups from different nationalities with other ethnic/racial groups.

References

Asian American Federation of New York. (2003). *Asian Aemricna elders in New York City: A study of health, social needs, quality of life, and quality of care.* New York: Asian American Federation of New York.

Beaumont, J. G., & Kenealy, P. M. (2004). Quality of life perceptions and social comparisons in healthy old age. *Aging and Society, 24*, 755-769.

Blustein, J., Chan, S., & Guanais, F. C. (2004). Elevated depressive symptoms among caregiving grandparents. *Health Service Research, 39*(6), 1671-1689.

Burton, L. M. (1996). Age norms, the timing of family role transitions, and intergenerational caregiving among aging African American women. *Gerontologist, 36*(2), 199-208.

Cunnyham, K. (2004). *Trends in food stamp participation rates: 1999–2002 (MPR Ref. No. 6044-109).* Washington, DC: Mathematica Policy Research, Inc.

Elder, G. H. (1996). Human lives in changing societies: Life course and developmental insights. In R. B. Cairns, G. H. Elder, & J. E. Costello, *Developmental Science* (pp. 31-62). New York: Cambridge University Press.

Fields, J. (2003). *Children's living arrangements and characteristics: March 2002* (Current Population Reports P20-547). Washington, DC: Bureau of the Census

Fuller-Thomson, E., & Minkler, M. (2005). American Indian/Alaskan Native grandparents raising grandchildren: Findings from the Census 2000 Supplementary Survey. *Social Work, 50*(2), 131-139.

Fuller-Thomson, E., & Minkler, M. (2007). Mexican American grandparents raising grandchildren: Findings from the Census 2000 American Community Survey. *Families in Society, 88*(4), 567-574.

Fuller-Thomson, E., & Redmond, M. (2008). Falling through the social safety net: Food stamp use and nonuse among older impoverished Americans. *Gerontologist, 48*, 235-244.

Generations United. (2008a). *Public policy agenda for the 110th Congress*. Retrieved October 30, 2008, from www.gu.org

Generations United. (2008b). *Public policy for grandfamilies.* Retrieved November 1, 2008, from http://www.gu.org/Grand8101303.asp

Gensler, H. (1995/96). The effect of race and sex on welfare benefits. Cato Journal, 15 [electronic version].

Goodman, C., & Silverstein, M. (2002). Grandmothers raising grandchildren: Family structure and well-being in cultually diverse families. *The Gerontologist, 42*(5), 676-689.

Goodman, C. C., & Silverstein, M. (2005). Latina grandmothers raising grandchildren: Acculturation and psycholocial well-being. *International Aging and Human Development, 60*(4), 305-316.

Goodman, C. C., & Silverstein, M. (2006). Grandmothers raising grandchildren: Ethnic and racial differences in well-being among custodial and coparenting families. *Journal of Family Issues, 27*(11), 1605-1626.

Harper, W. J., & Hardesty, P. H. (2001). Differentiating characteristics and needs of minority grandparent caregivers. *Journal of Ethnic & Cultural Diversity in Social Work, 9*(3), 113-150.

Hayslip, B. J., & Kaminski, P. L. (2005). Grandparents raising their grandchildren: A review of the literature and suggestions for practice. *The Gerontologist, 45*(2), 262-269.

Hughes, M. E., & Waite, L. J. (2002). Health in household context: Living arrangements and health in late middle age. *Journal of Health and Social Behavior, 43*(1), 1-21.

Hughes, M. E., Waite, L. J., LaPierre, T. A., & Luo, Y. (2007). All in the family: The impact of caring for grandchildren on grandparents' health . *Journal of Gerontology: Social Sciences, 62B*(2), S108-S119.

Hunter, A., & Tayler, R. J. (1998). Grandparenthood in African American families. In M. Szinovacz, *Handbook on Grandparenthood* (pp. 70-86). Westport, CT: Greenwood Press.

Kamo, Y. (1998). Asian grandparents. In N. V. Benokraitis, *Contemporary ethnic families in the United States: Characteristics, Variations, and dynamics* (pp. 385-394). NJ: Prentice Ha.

Kataoka-Yahiro, M., Ceria, C., & Caulfield, R. (2004). Grandparent caregiving role in ethnically diverse families. *Journal of Pediatric Nursing, 19*(5), 315-328.

Kropf, N. P., & Yoon, E. K. (2006). Grandparents raising grandchildren: Who are they? In B. Berkman, *Handbook of Social Work in Health and Aging* (pp. 355-362). New York: Oxford Press.

Le, C. N. (2009). *Socioeconomic Statistics & Demographics: The Landscape of Asian America*. Retrieved May 9, 2009, from Asian-Nation: http://www.asian-nation.org/demographics.shtml

Minkler, M., & Fuller-Thomson, E. (1999). The health of grandparents raising grandchildren: Results of a national study. *American Journal of Public Health, 89(9)* , 1384-1389.

Minkler, M., & Fuller-Thomson, E. (2001). Physical and mental health status of American grandparents providing expetnsive child care to their grandchildren. *Journal of American Medical Women Associations, 56*(4), 199-205.

Minkler, M., & Fuller-Thomson, E. (2005). African American grandparents raising grandchildren: A national study using the Census 2000 American Community Survey. *Journal of Gerontology: Social Sciences, 60B*(2), S82-S92.

Minkler, M., Roe, K. M., & Price, M. (1992). The physical and emotional health of grandmothers raising grandchildren in the crack coaine epidemic. *Gerontologist, 32* , 752-760.

Monette, D. R., & Sullivan, T. J. (2007). Ethical issues in social research. In D. R. Monette, T. J. Sullivan, & C. R. DeJong, *Applied Social Research: A Tool for the Human Services (7th Ed.)* (pp. 47-72). Belmont, CA: Brooks/Cole.

Montgomery County Department of Health and Human Services. (2005). *Who are Asian Americans?* Retrieved April 26, 2009, from Asian American Health Initiative: http://www.aahiinfo.org/english/asianAmericans.php#profiles

Mutchler, J. E., Lee, S., & Baker, L. A. (2006a). *Grandparent care in the African-American Population.* Boston: Gerontology Institute and Department, University of Massachusetts. Retrieved November 25, 2008, from http://158.121.160.72/inst/pubAndStudies/GrandparentCareintheAfricanAmericanPopulation.pdf

Mutchler, J. E., Lee, S., & Baker, L. A. (2006b). *Grandparent care in the Asian population.* Boston: Gerontology Institute and Department, University of Massachusetts. Retrieved November 25, 2008, from http://158.121.160.72/inst/pubAndStudies/GrandparentCareintheAsianPopulation.pdf

Mutchler, J. E., Lee, S., & Baker, L. A. (2006c). *Grandparent care in the Latino/Hispanic Population.* Boston: Gerontology Institute and Department, University of

Massachusetts. Retrieved November 25, 2008, from http://158.121.160.72/inst/pubAndStudies/GrandparentCareintheLatinoPopulation.pdf

Mutchler, J. E., Lee, S., & Baker, L. A. (2006d). *Grandparent care in the non-Hispanic White population.* Boston: Gerontology Institute and Department, University of Massachusetts. Retreived November 25, 2008, from http://158.121.160.72/inst/pubAndStudies/GrandparentCareintheWhitePopulation.pdf

Mutchler, J. E., Lee, S., & Baker, L. A. (2006e). *Grandparent care in the United States: Comparisions by race and ethnicity.* Boston: Gerontology Institute and Department, University of Massachusetts. Retreived November 25, 2008, from http://158.121.160.72/inst/pubAndStudies/DiversityinGrandparentCareHouseholds.pdf

Phua, V. C., & Kaufman, G. (2008). Grandparenting responsibility among elderly Asian Americans: The effects of householder status, ethnicity, and immigration. *Journal of Intergenerational Relationships, 6*(1), 41-59.

Phua, V. C., Kaufman, G., & Park, K. S. (2001). Strategic adjustments of elderly Asian Americans: Living arrangements and headship. *Journal of Comparative Family Studies, 32* , 263-281.

Project health grandparents (2008). Retrieved November 1, 2008, from http://www2.gsu.edu/~wwwalh/index.html

Pruchno, R. (1999). Raising Grandchildren: The experiences of Black and White grandmothers. *The Gerontologist, 39* , 209-221.

Richard, L., Laforest, S., Dufresne, F., & Sapinski, J. P. (2005). The quality of life of older adults living in an urban environment: Professional and lay perspectives. *Canadian Journal on Aging, 24*(1), 19-30.

Simmons, T., & Dye, J. L. (2003). *Grandparents living with grandchildre: 2000.* Retrieved November 25, 2008, from Washington DC: US Census Bureau: http://www.census.gov/prod/2003pubs/c2kbr-31.pdf

Solomon, J. C., & Marx, J. (1999). Who cares? Grandparnt/grandchild households. *Journal of Women & Aging, 11*(1), 3-25.

Strawbridge, W. J., Wallhagen, M. I., Shema, S. J., & Kaplan, G. A. (1997). New burdens or more of the same? Comparing grandparent, spouse, and adult-child caregivers. *Gerontologist, 37* , 505-510.

Tam, V. C.-W., & Detzner, D. F. (1998). Grandparents as a family resource in Chinese American famillies: Perceptions of the middle generation. In H. I. McCubbin, E. A. Thompson, A. I. Thomson, & J. E. Fromer, *Resilliency in Native-American and Immigrant Families* (pp. 243-263). Thousand Oaks, CA: Sage Publications.

Torrieri, N. K. (2007). American is changing, and so is the census: The American Community Servey. *The American Statistics, 61*(1), 16-21.

U.S. Census Bureau. (2008a). *Accuracy of the data (2007).* Retrieved November 28, 2008, from American Community Survey: http://www.census.gov/acs/www/Downloads/ACS/accuracy2007.pdf

U.S. Census Bureau. (2008b). *American Community Survey: Subject Definition.* Retrieved November 25, 2008, from http://www.census.gov/acs/www/Downloads/2007/usedata/Subject_Definitions.pdf

U.S. Census Bureau. (2006). *Design and methology: American Community Survey (Technical paper 67).* Retrieved November 28, 2008, from http://www.census.gov/acs/www/Downloads/tp67.pdf

U.S. Census Bureau. (2008c). *PUMS accuracy of the data (2007).* Retrieved November 28, 2008, from American Community Survey: http://www.census.gov/acs/www/Downloads/2007/AccuracyPUMS.pdf

U.S. Census Bureau. (2007). *Questions and answers: American Community Survey, ADDC/07-ACSQA(04-2007).* Washington, DC: U.S. Census Bureau.

Whitley, D. M., Kelley, S. J., & Sipe, T. A. (2001). Grandmothers raising grandchildren: Are they at increased risk of health problems? *Health and Social Work, 26* , 105-114.

Yoon, S. M. (2005). The characteristics and needs of Asian-American grandparent caregivers: A study of Chinese-American and Korean American grandparents in New York city. *Journal of Gerontological Social Work, 44*(3), 75-94.

Table 1.Age and Household Income of Grandparent Caregivers[1]

Variables	Operationalization	Mean (SD)	**Median**	**Mode**	**Skewness**
Age	Actual number of years (30-94 years)	56.51 (9.96)	56.00	54.00	0.33
Household Income	Total combined income of family members	61655.37 (53051.43)	50000.00	30000.00	3.34

[1] n=68,678 for age variable; n= 68,660 for household income variable

Table 2. Demographics, Caregiving Status, Health, and Service Use of Grandparent Caregivers[1]

	Variables	Operationalization	Frequency
Demographics	Ethnicity	1= White	63.07%
		2= African American	24.61%
		3= Asian	2.99%
		4= Hispanic/Latino Origins	9.33%
	Gender	1= Male	37.86%
		2= Female	62.14%
	Marital status	1= Married	68.98%
		2= Not married	31.02%
	Immigrant status	1= American-born	89.53%
		2= Foreign-born	10.47%
	Education	1= < High school graduate	26.39%
		2= High school graduate	36.24%
		3= Some college	26.60%
		4= College degree or more	10.78%
	Employment	1= Employed	54.26%
		2= Not employed	45.74%
	Overcrowded household	0= a household has equal to (or less than) one person per room	88.53%
		1= a household has more than one person per room	11.47%
	Poverty Status	1= <100	17.19%
		2= 100-199	25.41%
		3= >200	57.41%
Caregiving status	Household structure	0= Skipped generation household	48.11%
		1= Three-generation household	51.89%
	Duration of caregiving	1=< 6 months	11.25%
		2=6 to 11months	10.16%
		3=1 or 2 years	23.37%
		4=3 or 4 years	16.71%
		5=5 or more years	38.51%
Physical Health Status	Sensory limitations	1= a person HAS blindness, deafness, or a severe vision or hearing impairment	7.89%
		2= a person does NOT have these sensory limitations	92.11%
	Medical conditions limiting physical activities	1= a person HAS a condition that substantially limits one or more basic physical activities (e.g. walking, climbing stairs, reaching, lifting, or carrying)	23.33%
		2= a person does NOT have that condition	76.67%
	Cognitive impairment	1= a person HAS difficulty in learning, remembering, or concentrating	8.63%
		2= a person does NOT have that difficulty	91.37%
	Limitations in ADLs	1= a person HAS difficulty in dressing, bathing, or getting around inside the home	5.97%
		2= a person does NOT have that difficulty	94.03%
	Limitations in going out	1= a person HAS difficulty in going outside the home alone to shop or visit a doctor's office	8.00%
		2= a person does NOT have that difficult	92.00%
	Limitations in working	1= a person HAS difficulty in working at a job or business	19.42%
		2= a person does NOT have that difficulty	80.58%

Public Income Support Programs	Public financial assistance	0= a person does NOT receive public assistance or welfare payments	93.52%
		1= a person RECEIVES public assistance or welfare payments	6.48%
	Food Stamps	0= a household does NOT receive food stamps benefits	90.27%
		1= a household RECEIVES food stamps benefits	9.73%

[1] n=68,678, except poverty status (n=68,677), household income and household structure (n=68,660), and financial assistance/food stamp (n=11,802) variables

Table 3. Characteristics of Grandparent Caregivers by Ethnicity[1]

Characteristics	White	African American	Asian	Hispanic	ANOVA/Chi-Square	Cramer's V
Demographics						
Age (years)						
M	56.59	56.43	60.28	54.92	F =155.81, df = 3**	
Gender (%)						
Male	41.61	27.76	38.97	38.81	χ^2= 996.76, df = 3**	0.12
Female	58.39	72.24	61.03	61.19		
Marital status (%)						
Married	75.83	49.38	75.84	72.18	χ^2= 4060.13, df = 3**	0.24
Not married	24.17	50.62	24.16	27.82		
Immigrant status (%)						
American-born	97.54	94.88	10.57	46.57	χ^2= 29758.65, df = 3**	0.66
Foreign-born	2.46	5.12	89.43	53.43		
Education (%)						
<High school graduate	20.47	29.85	33.90	54.82		
High school graduate	39.23	24.95	23.87	23.38	χ^2= 4081.88, df = 9**	0.14
Some college	28.67	26.19	18.66	16.20		
>College degree	11.63	9.01	23.58	5.59		
Employment (%)						
Employed	56.51	49.69	44.18	54.34	χ^2= 314.77, df = 3**	0.07
Not employed	43.49	50.31	55.82	45.66		
Household income ($)[2]						
M	67004.46	46507.72	94119.58	55038.26	F =1248.76, df = 3**	
Overcrowded (%)						
Yes	7.51	12.42	30.98	29.44	χ^2=3490.60, df = 3**	0.23
No	92.49	87.58	69.02	70.56		
Poverty status (%)						
<100	12.13	28.62	9.60	23.57		
100-199	23.21	28.80	28.80	38.77	χ^2= 3772.00, df = 6**	0.17
>200	64.65	42.57	69.61	43.66		
Caregiving status						
Dur. of caregiving (%)						
<6 months	11.55	9.57	12.23	13.32		
6-11 months	10.71	8.93	10.08	9.71	χ^2= 395.23, df = 12**	0.04
1 or 2 years	23.59	21.85	25.52	25.15		
3 or 4 years	17.25	15.18	19.05	16.36		
5 or more years	36.90	44.46	33.12	35.47		
Household structure (%)						
Skipped	49.44	50.78	39.62	34.82	χ^2= 590.71, df = 3**	0.09
Three generation	50.56	49.22	60.38	65.18		
Health status						
Sensory limitations (%)						
Yes	8.14	7.49	5.75	7.90	χ^2= 20.28, df = 3*	0.02
No	91.86	92.51	94.25	92.10		
Medical problems (%)						
Yes	23.26	26.60	13.59	18.34	χ^2= 298.84, df = 3**	0.07
No	76.74	73.40	86.41	81.66		
Cognitive impair. (%)						
Yes	8.06	10.63	6.72	7.77	χ^2= 118.94, df = 3**	0.04
No	91.94	89.37	93.28	92.23		
Limitations in ADLs (%)						
Yes	5.61	7.84	3.26	4.36	χ^2= 172.03, df = 3**	0.05
No	94.39	92.16	96.74	95.64		

Lim. in going out (%)						
Yes	7.33	10.03	9.35	6.81	χ^2= 139.10, *df* = 3**	0.05
No	92.67	89.97	90.65	93.19		
Lim. in working (%)						
Yes	18.94	23.18	14.27	14.44	χ^2= 295.23, *df* = 3**	0.06
No	81.06	76.82	85.73	85.56		
Support program						
Financial Assistance (%)						
Receive	4.79	8.56	10.15	5.23	χ^2= 67.28, *df* = 3**	0.07
Do not receive	95.21	91.44	89.85	94.77		
Food Stamps (%)						
Receive	8.49	11.84	6.09	7.75	χ^2= 43.56, *df* = 3**	0.06
Do not receive	91.51	88.16	93.91	92.25		

Note. [1]Total respondents were 68,678, except poverty status (n=68,677), household income (n=68,651), household structure (n=68,660), and financial assiatance/food stamps (n=11,802) variables.

[2]Each mean of household income variables was reported with the original values, but regression analysis was conducted after a square root transformation of the value was performed.

*p=.0001, **p<.0001

Table 4. Characteristics of Grandparent Caregivers by Household Types[1]

Characteristics	Skipped Household	Three-Generation Household	*t*-test / Chi-square	Cramer's V
Demographics				
Age (years)			t = 55.35, df =	
M (SD)	58.64 (9.43)	54.54 (9.97)	69E3**	
Gender (%)				
Male	36.81	38.84	χ^2= 30.08, df = 1**	-0.02
Female	63.19	61.16		
Marital status (%)				
Married	67.64	70.24	χ^2= 54.09, df = 1**	-0.03
Not employed	32.36	29.76		
Immigrant status (%)				
American-born	92.40	86.89	χ^2= 556.10, df = 1**	0.09
Foreign-born	7.60	13.11		
Education (%)				
<High school graduate	27.94	24.93		
High school graduate	36.59	35.91	χ^2= 132.41, df = 3**	0.04
Some college	25.57	27.56		
>College degree	9.90	11.60		
Employment (%)				
Employed	47.56	60.48	χ^2= 1153.59, df = 1**	-0.13
Not employed	52.44	39.52		
Household income ($)[2]				
M (SD)	51737 (49473)	70852 (54280)	t = -58.57, df = 69E3**	
Overcrowded (%)				
Yes	4.48	17.90	χ^2=3046.94, df = 1**	0.21
No	95.52	82.10		
Poverty status (%)				
<100	20.46	14.12	χ^2= 525.64, df = 2**	0.09
100-199	25.48	25.34		
>200	54.06	60.54		
Caregiving status				
Duration of caregiving (%)				
<6 months	8.12	14.13		
6-11 months	7.98	12.19	χ^2= 3227.70, df = 4**	0.22
1 or 2 years	18.80	27.60		
3 or 4 years	16.15	17.23		
5 or more years	48.95	28.85		
Health status				
Sensory limitations (%)				
Yes	8.62	7.21	χ^2= 46.53, df = 1*	0.03
No	91.38	92.79		
Medical problems (%)				
Yes	26.52	20.38	χ^2= 361.89, df = 1**	0.07
No	46.11	53.89		
Cognitive impair. (%)				
Yes	9.60	7.72	χ^2= 76.17, df = 1**	0.03
No	90.40	92.28		
Limitations in ADLs (%)				
Yes	6.67	5.32	χ^2= 55.87, df = 1**	0.03
No	93.33	94.68		
Lim. in going out (%)				
Yes	8.95	7.13	χ^2= 76.74, df = 1**	0.03
No	91.05	92.87		

Lim. in working (%)				
Yes	22.69	16.40	χ^2= 432.97, *df* = 1**	0.08
No	77.31	83.60		
Support program				
Public Financial Assistance (%)				
Receive	7.22	5.47	χ^2= 14.69, *df* = 1*	-0.04
Do not receive	92.78	94.53		
Food Stamps (%)				
Receive	8.32	11.63	χ^2=35.97, *df* = 1**	0.06
Do not receive	91.68	88.37		

Note.[1]Total respondents were 68,660 regarding all variables, except household income (n=68651), and financial assistance/food stamps (n=11,790) variables

[2]Each mean of household income variables was reported with the original values, but *t*-tests were conducted after a square root transformation of the value was performed.

**p*=.0001, ***p*<.0001

Table 5. Characteristics of Different Ethnic Groups of Grandparent Caregivers within Two Household Structures[1]

Characteristics	Skipped Generation Household					Three Generation Household				
	White (n=21,413)	African American (n=8,579)	Asian American (n=813)	Hispanic (n=2,229)	*F* or χ^2	White (n=21,898)	African American (n=8,317)	Asian American (n=1,239)	Hispanic (n=4,172)	*F* or χ^2
Demographics										
Age (years)					*F* =41.39					*F* =128.57
M	58.47	58.78	62.17	58.43	*df* =3**	54.76	54.02	59.06	53.05	*df* =3**
Gender (%)										
Male	41.09	27.30	30.75	34.45	χ^2= 520.57,	42.13	28.24	44.31	41.08	χ^2= 517.20,
Female	58.91	72.70	69.25	65.55	*df* = 3**	57.87	71.76	55.69	58.92	*df* = 3**
Marital status (%)					χ^2=					χ^2=
Married	75.85	48.67	61.75	64.02	2096.31,	75.82	50.17	85.15	72.56	2138.98,
Not married	24.15	51.33	38.25	35.98	*df* = 3**	24.18	49.83	14.85	23.47	*df* = 3**
Immigrant status (%)					χ^2=					χ^2=
American-born	97.83	96.20	10.82	55.36	13131.69,	97.26	93.52	10.41	41.90	16161.18,
Foreign-born	2.17	3.80	89.18	44.64	*df* = 3**	2.74	6.48	89.59	58.10	*df* = 3**
Education (%)										
<High school grad	23.06	32.57	38.99	52.98	χ^2=	17.94	27.03	30.59	55.78	χ^2=
High school grad	39.22	34.33	23.00	25.03	1269.84,	39.23	35.60	24.46	22.51	3011.92,
Some college	27.23	24.63	16.24	16.64	*df* = 9**	30.08	27.80	20.26	15.99	*df* = 9**
>College degree	10.49	8.47	21.77	5.34		12.75	9.57	24.70	5.73	
Employment (%)										
Employed	50.40	43.11	31.12	43.38	χ^2=241.18,	62.49	56.49	52.78	60.19	χ^2= 123.34,
Not employed	49.60	56.89	68.88	56.62	*df* = 3**	37.51	43.51	47.22	39.81	*df* = 3**
Household income ($)[2]					*F* =596.91					*F* =707.26
M	56244	38933	84259	42976	*df* =3**	77233	54321	100590	61483	*df* =3**
Overcrowded (%)					χ^2=					χ^2=
Yes	2.48	5.47	24.35	12.65	1317.87,	12.42	19.50	35.27	38.33	1900.52,
No	97.52	94.53	75.65	87.35	*df* = 3**	87.58	80.50	64.73	61.67	*df* = 3**
Poverty status (%)										
<100	14.76	32.77	13.28	30.42	χ^2=	9.56	24.30	7.10	19.89	χ^2=
100-199	24.13	27.98	21.53	30.28	1817.66,	22.31	29.67	20.34	34.06	2024.96,
>200	61.11	39.26	65.19	39.30	*df* = 6**	68.13	46.03	72.56	46.05	*df* = 6**
Caregiving status										
Duration of care (%)										
<6 months	8.18	7.10	13.53	9.47		14.82	12.12	11.30	15.34	
6-11 months	8.49	6.55	9.59	7.99	χ^2= 204.07,	12.89	11.39	10.41	10.64	χ^2= 219.25,
1 or 2 years	19.15	17.36	22.76	19.61	*df* = 12**	27.93	26.48	27.36	28.14	*df* = 12**
3 or 4 years	16.69	14.58	17.71	16.38		17.80	15.80	19.94	16.35	
5 or more years	47.49	54.41	36.41	46.57		26.55	34.22	30.99	29.53	

Health status										
Sensory limitation (%)										
Yes	8.63	8.17	7.50	10.54	χ^2= 13.96,	7.65	6.79	4.60	6.50	χ^2= 24.39,
No	91.37	91.83	92.50	89.46	*df* = 3	92.35	93.21	95.40	93.50	*df* = 3**
Medical problems (%)										
Yes	25.68	30.18	15.13	24.67	χ^2= 92.51,	20.89	22.88	12.59	14.98	χ^2= 156.90,
No	74.32	69.82	84.87	75.33	*df* = 3**	79.11	77.12	87.41	85.02	*df* = 3**
Cognitive impair. (%)										
Yes	8.64	12.09	6.77	10.23	χ^2= 124.69,	7.50	9.10	6.70	6.47	χ^2=34.72,
No	91.36	87.91	93.23	89.77	*df* = 3**	92.50	90.90	93.30	93.53	*df* = 3**
Lim. in ADLs (%)										
Yes	5.94	8.98	3.20	6.19	χ^2= 108.28,	5.30	6.66	3.31	3.38	χ^2= 517.20,
No	94.06	91.02	96.80	93.81	*df* = 3**	94.70	93.34	96.69	96.62	*df* = 3**
Lim. in going out (%)										
Yes	7.86	11.24	11.81	9.60	χ^2= 95.88,	6.81	8.80	7.75	5.32	χ^2= 59.80,
No	92.14	88.76	88.19	90.40	*df* = 3**	93.19	91.20	92.25	94.68	*df* = 3**
Lim. in working (%)										
Yes	21.36	26.93	17.84	20.91	χ^2= 124.47,	16.57	19.31	11.95	11.00	χ^2= 158.46,
No	78.64	73.07	82.16	79.09	*df* = 3**	83.43	80.69	88.05	89.00	*df* = 3**
Support program										
Financial assistance (%)										
Receive	5.35	9.32	12.96	6.34	χ^2= 41.17,	3.92	7.52	5.68	4.34	χ^2= 28.28,
Do not receive	94.65	90.68	87.04	93.66	*df* = 3**	96.08	92.48	94.32	95.66	*df* = 3**
Food Stamps (%)										
Receive	7.37	9.89	6.48	6.49	χ^2= 16.28,	10.78	14.55	5.68	8.80	χ^2= 30.57,
Do not receive	92.63	90.11	93.52	93.51	*df* = 3**	89.82	85.45	94.32	91.20	*df* = 3**

Note. [1]Total respondents were 68,660 regarding all variables, except household income (n=68,651) and financial assistance/food stamp (n=11,790) variables
[2]Each mean of household income variables was reported with the original values, but regression analysis was conducted after a square root transformation of the value was performed.
*p<.001**p<.0001

Table 6. Logistic Regression Analysis of Health Status on Ethnicity, Household Structure, and Other Characteristics

Variables	Medical Problems			Cognitive Impairment			Limitations in ADLs			Limitations in Going out			Limitations in Working		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Ethnicity[a]															
African American	1.19***	1.12**	0.82***	1.35***	1.24***	0.87*	1.43***	1.28***	0.98	1.41***	1.32***	0.96	1.29***	1.21***	0.83***
Asian American	0.54***	0.55***	0.70**	0.84	0.89	1.13	0.58***	0.61*	0.85	1.34**	1.15	1.30†	0.74***	0.68***	0.87
Hispanic	0.78***	0.67***	0.65***	1.00	0.85†	0.72***	0.79**	0.63***	0.66***	0.96	0.77**	0.69***	0.76***	0.62***	0.55***
Skipped[b]	1.38***	1.31***	0.93*	1.26***	1.17***	0.87**	1.24***	1.13*	0.81***	1.27***	1.17***	0.81***	1.47***	1.37***	0.92*
Ethnicity x Household Type[c]															
African American x Skipped		1.11	1.12		1.18*	1.12*		1.24*	1.25*		1.12	1.14		1.13*	1.18*
Asian American x Skipped		0.95†	0.87		0.87	0.79		0.86	0.83		1.37†	1.22		1.17	1.10
Hispanic x Skipped		1.42***	1.30**		1.41**	1.36*		1.67***	1.53*		1.62***	1.50**		1.56***	1.50***
Demographics															
Age			1.01***			0.99***			1.00			1.01***			1.00
Female[d]			0.91***			0.78***			0.89*			1.03			0.75***
Not married[e]			1.24***			1.31***			1.09†			1.24**			1.32***
Foreign-born[f]			0.59***			0.72***			0.58***			0.74***			0.59***
High school grad[g]			0.78***			0.64***			0.84***			0.78***			0.74***
Some college[g]			0.87***			0.68***			0.92			0.76***			0.77***
>College degree[g]			0.63***			0.49***			0.76**			0.62***			0.51***
Not employed[h]			4.42***			4.74***			8.29***			9.30***			13.0***
Household income			1.00***			1.00***			1.00***			1.00***			1.00***
Overcrowded[i]			1.10*			1.30			1.04			1.09			1.04
Povertyline <100[j]			1.45***			1.48***			1.47***			1.41***			1.50***
Povertyline 100-199[j]			1.33***			1.31***			1.33***			1.34***			1.37***
<6 mons caregiving[k]			0.82***			0.95			0.86†			0.99			0.85***
6-11mons caregivng[k]			0.84***			0.96			0.98			0.96			0.89*
1 or 2 yrs caregiving[k]			0.87***			0.92†			0.90†			0.94			0.86***
3 or 4 yrs caregiving[k]			0.90**			0.95			0.92			0.96			0.89**
Model Chi-Square	604.24	626.37	8648.32	182.91	206.10	3668.01	212.12	232.17	2629.71	208.68	232.38	3655.84	671.16	693.48	10007.79
Degrees of freedom	4	7	23	4	7	23	4	7	23	4	7	23	4	7	23
Significance of Model	<.0001	<.0001	<.0001	<.0001	<.0001	<0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

[a] Reference group is White; [b] is Three generation Household; [c] is Whites in skipped generation household, [d] is Male; [e] is Married; [f] is American-born; [g] is Less than High School Education; [h] is Employed; [i] is Not Overcrowded Household; [j] is Poverty Line >200; [k] is 5yr or more Caregiving
n=68,600, †p<.05, *p<.01**p<.001, ***p<.0001

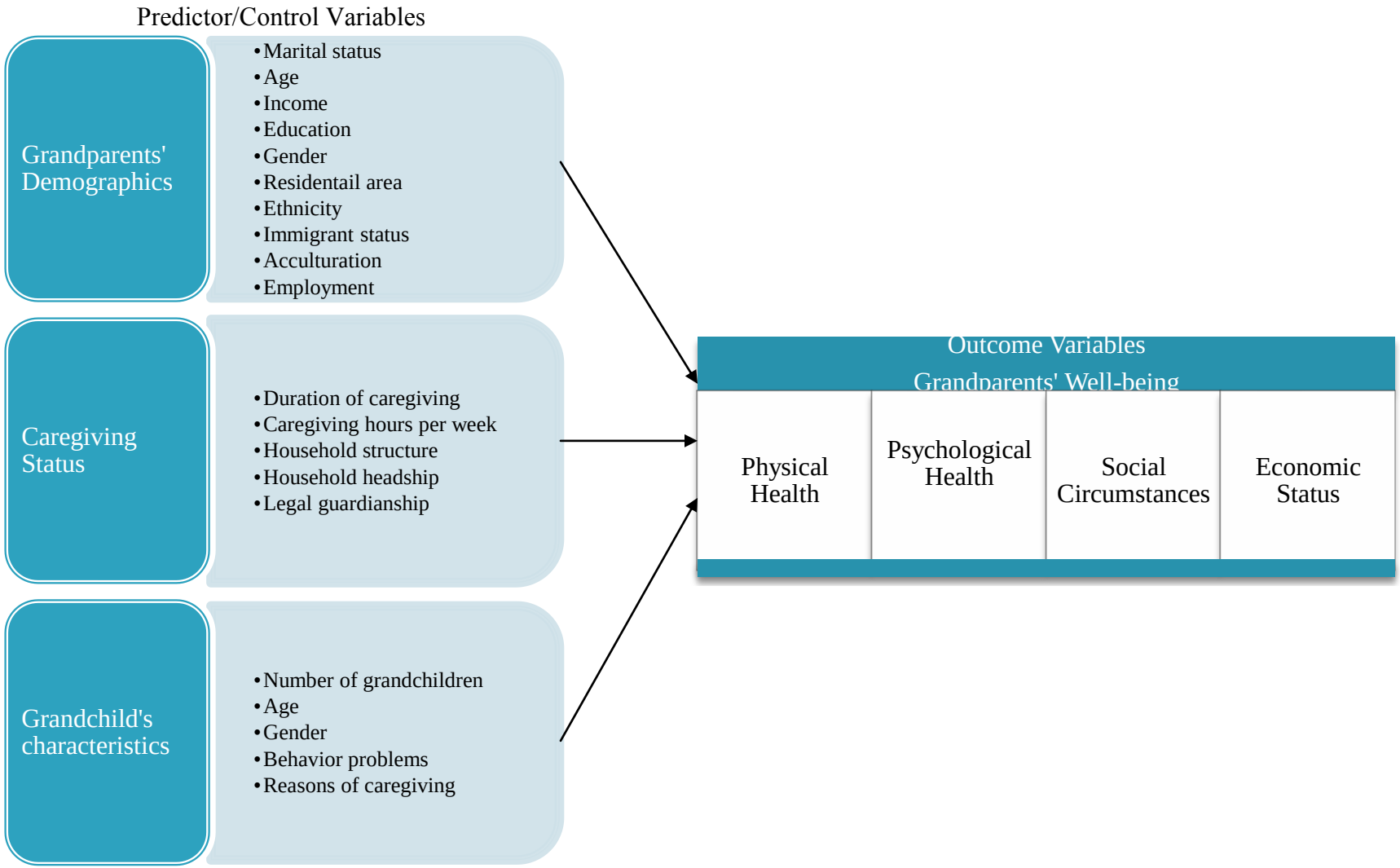
Table 7. Logistic Regression Analysis of Public Income Service on Ethnicity, Household Structure, and Other Characteristics

Variables	Public Financial Assistance			Food Stamps		
	I	II	III	I	II	III
Ethnicity[a]						
African American	1.88***	1.99***	1.91***	1.44***	1.50***	1.35*
Asian American	2.17*	1.47	1.57	0.69	0.53	0.91
Hispanic	1.15	1.11	1.09	0.86	0.85	1.05
Skipped[b]	1.30**	1.39†	1.30	0.68***	0.70**	0.73*
Ethnicity x Household Type[c]						
African American x Skipped		0.91	0.90		0.92	0.92
Asian American x Skipped		1.79	1.61		1.64	1.57
Hispanic x Skipped		1.08	1.05		1.03	0.96
Demographics						
Age			1.01			0.99*
Female[d]			0.76*			0.96
Not married[e]			1.36*			1.42***
Foreign-born[f]			1.06			0.58**
High school grad[g]			0.97			0.80*
Some college[g]			0.81			0.85
>College degree[g]			1.00			0.48*
Not employed[h]			0.91			1.06
Household income			1.00***			1.00*
Overcrowded [i]			0.92			1.25†
<6 mons caregiving [j]			1.17			1.09
6-11mons caregivng [j]			1.23			1.02
1 or 2 yrs caregiving [j]			1.12			1.04
3 or 4 yrs caregiving [j]			1.02			1.06
Model Chi-Square	81.11	83.06	126.69	81.26	82.58	165.31
Degrees of freedom	4	7	21	4	7	21
Significance of Model	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

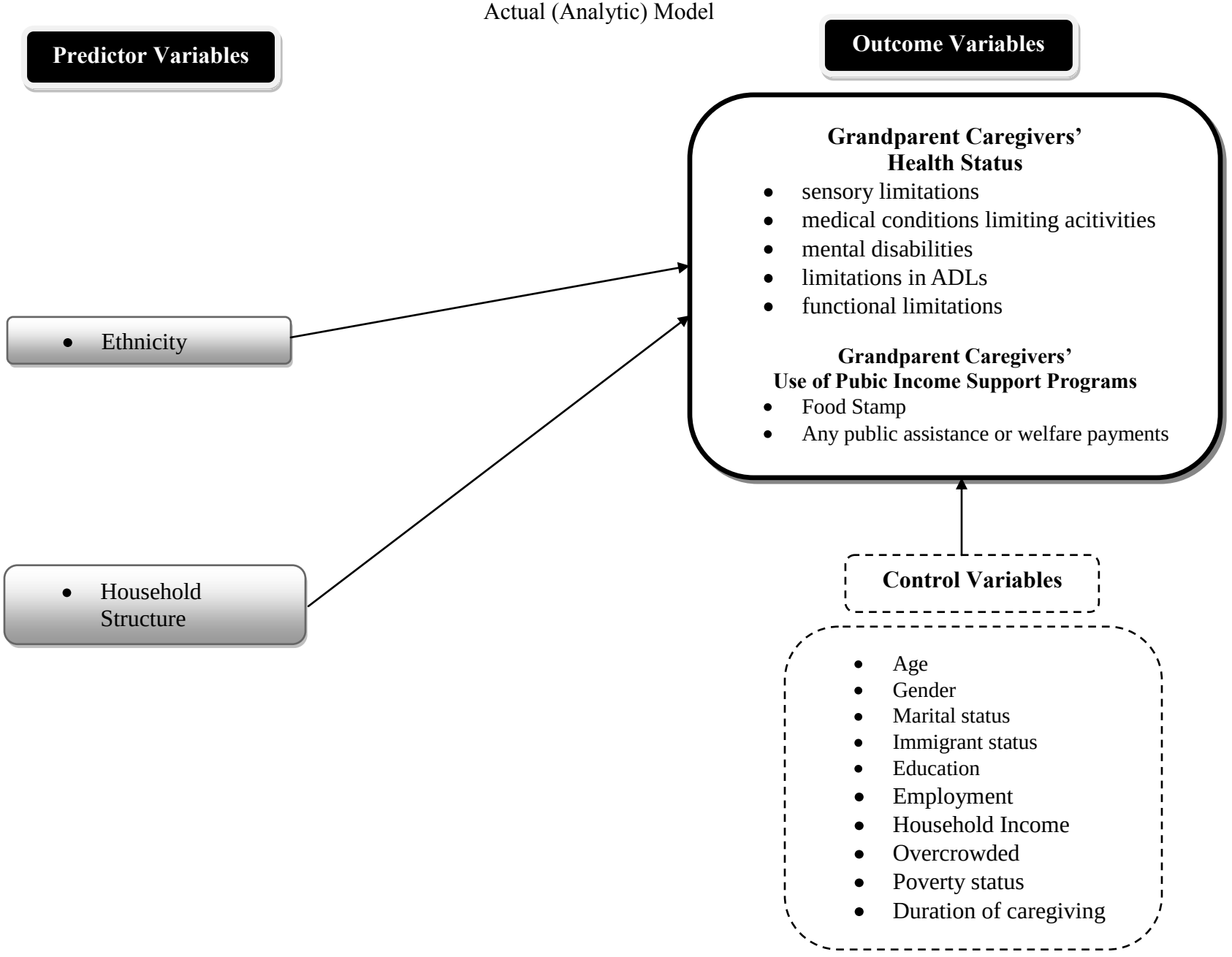
[a] Reference group is White; [b] is Three generation Household; [c] is Whites in skipped generation household, [d] is Male; [e] is Married; [f] is American-born; [g] is Less than High School Education; [h] is Employed; [i] is Not Overcrowded Household; [j] is 5yr or more Caregiving

n=11,790, †p<.05, *p<.01, **p<.001, ***p<.0001

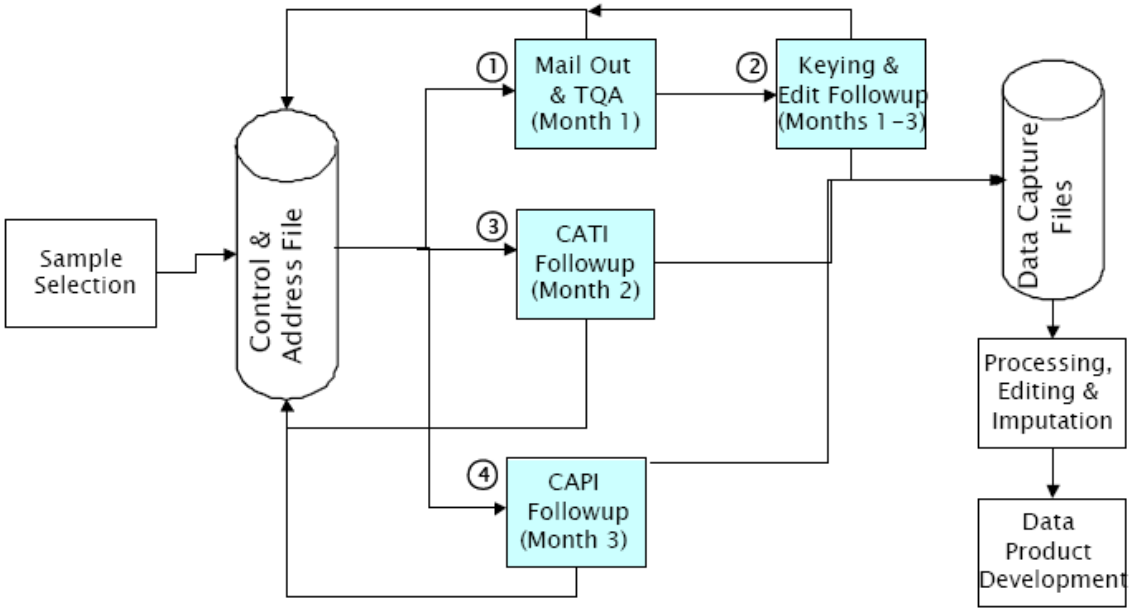
Appendix A
Theoretical Model



Appendix B
Actual (Analytic) Model



Appendix C
ACS Sample Selection, Data Collection, and Processing



NOTE: Numbers represent the general flow of primary operations over a given three month period.

Source: U.S. Census Bureau. (2003). *American Community Survey Operation Plan.* Retrieved November 28, 2008 from http://www.census.gov/acs/www/Downloads/OpsPlanfinal.pdf