



U.S. Department of Health and Human Services
Assistant Secretary for Planning and Evaluation
Office of Disability, Aging and Long-Term Care Policy

THE IMPACT OF FEMALE CAREGIVERS' EMPLOYMENT STATUS ON PATTERNS OF FORMAL AND INFORMAL ELDERCARE

Office of the Assistant Secretary for Planning and Evaluation

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This article uses data from the 1989 National Long-Term Care Survey and its companion Informal Caregivers Survey to investigate how the employment of female primary caregivers (FPCGs) affects hours of care received by disabled Elderly care recipients (CRs). Multivariate analyses controlling for key FPCG and CR characteristics indicate that when FPCGs are employed they provide significantly fewer hours of care personally; however, their CRs also receive significantly more hours of help from other sources. When FPCGs work more than 17 hours per week, their CRs receive significantly fewer total weekly hours of care than would otherwise be the case.

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Historically, most persons aged 65 and older in need of help with Activities of Daily Living (ADLs) such as bathing, dressing, transferring, toileting, and eating, or with Instrumental Activities of Daily Living (IADLs) such as cooking, housecleaning, shopping, managing money or medication, were able to count on receiving all or most of the help they required from informal--i.e., unpaid--helpers. Because most of these unpaid helpers have been women, many experts on long-term care of the elderly expect increased rates of female labor force participation to reduce the availability of informal help and increase demand for formal--i.e., paid--services. This in turn is expected to create political pressure to expand public financing for eldercare (Pepper Commission, 1990; OECD, 1994) and/or a market for private long-term care insurance (Schaeffer, 1997).

The 1989 National Long-Term Care Survey (NLTCS) and its companion Informal Caregivers Survey (ICS) provide nationally representative data on older Americans with functional disabilities, their sources of human assistance (both paid and unpaid), and various characteristics of their primary informal caregivers (such as employment status). These data can serve to test assumptions about how female labor force participation affects disabled elders' access to assistance, as well as the amount of help they receive from various informal sources and from paid providers.

BACKGROUND

Theoretical and Policy Perspectives

Over the past three decades, the involvement of American women aged 16 and older in paid work has increased dramatically--from 39% in 1965 to 58% in 1993. Although women's labor force participation has remained lower than men's, which averaged over 75% in 1993, the Bureau of Labor Statistics forecasts an additional gain of five percentage points for women by the year 2005 (Hayghe, 1994).

From the perspective of informal eldercare, the labor force participation of middle-aged women is of particular interest because they are more likely than younger women to become caregivers of older spouses, siblings, parents, or parents-in-law. In 1993, 77% of women aged 35 to 44 and 74% of women age 45 to 54 were employed--up from 46% and 51% respectively in 1965. On the other hand, the labor force participation of women aged 55 and older did not increase; 23% were employed in 1965 as compared to 25% in 1993 (Hayghe, 1994). As of 1993, the labor force participation rate for women aged 45 to 54 was 73.5%--but only 57.1% for women aged 55 to 59, 37.1% for women aged 60 to 64, and 8.2% for women 65 and older (MetLife, 1994). According to Weaver (1994), the reduction in female labor force participation that begins at age 55 reflects early retirement decisions that are economically motivated (i.e., the women's own and/or their husbands' pension income makes retirement affordable).

Two distinct--but by no means contradictory--arguments provide the basis for predictions that trends in female labor force participation will significantly decrease the availability of informal eldercare and increase the demand for formal services. The simplest, most straightforward argument is that employment, especially full-time employment, limits the time that family members can devote to eldercare. Because employed primary caregivers cannot be in two places at once, someone else must provide care during the hours when they are at work. Making an implicit analogy with the rise of paid daycare for preschool children many experts assume that paid caregivers will also be needed for disabled elders whose daughters or daughters-in-law are in the labor force.

A second more complex and nuanced rationale is offered predominantly by theorists who see the effect of women's labor force participation on eldercare as inextricably bound with broader issues of cultural change related to gender-based roles in society. In this view, women traditionally have been socialized to an "ethic of care" (Stohs, 1994), defined as feeling compelled to be attentive and responsive to the needs of individual family members. As increasing percentages of women enter the paid work force and pursue careers outside the home, however, they become sensitized to a competing "ethic of equity" that challenges the fairness of socially assigned gender roles. Although traditional cultural expectations have been for female relatives to

provide considerable unpaid eldercare, they of course are not legally required to do so. According to Osterbusch, Keigher, Miller, and Linsk (1986),

[the] feminized structure of family caregiving raises issues of equity because, in order to fulfill what can be viewed as both a private and a public responsibility, women must often forego other opportunities and the freedom to make choices that maybe critical to their well-being. ... The inequity of the situation aside, this arrangement is unlikely to survive in the future, when the costs of caregiving will become too great for women who must also work outside the home.

Previous Research

A sizable amount of literature documents conflicts between labor force participation, especially women's labor force participation, and informal eldercare (Barr, Johnson, & Warshaw, 1992; Ettner, 1995; McLanahan & Monson, 1990; Pavalko & Artis, 1997; Scharlach & Boyd, 1989; Stone, Cafferata, & Sangl, 1987; Stone & Short, 1990; Wolf & Soldo, 1994). Most studies have been concerned primarily with measuring the effects of informal eldercare responsibilities on caregivers' employment--focusing on such questions as whether conflicts between employment and caregiving responsibilities caused caregivers to withdraw from the labor market, be late or absent more often than workers without caregiving responsibilities, take unpaid leave, or reduce their hours of work on a regular basis. Wolf & Soldo (1994), for example, found no evidence in the National Survey of Families and Households of reduced propensity among married women to be employed, or of reduced conditional hours of work, due to the provision of parent care. Some studies have examined whether employment affects the decision to take on caregiving responsibilities. In their analysis of the National Longitudinal Survey of Mature Women, Pavalko & Artis (1997) found that employment did not affect the decision of middle-aged women to take on eldercare responsibilities but, in their study, the women who did take on these responsibilities were subsequently more likely to reduce their hours of employment or stop working in response to caregiving demands.

Fewer studies have examined how a caregiver's employment status affects the amount of caregiving provided to elderly care recipients. In their pioneering work, involving interviews with pairs of older mothers and their caregiving daughters, Brody and Schoonover (1986) found that the care recipients whose caregivers were employed received just as much help as those whose caregivers were not employed, although there was a slight reduction in the hours that the employed caregivers provided. However, the caregivers in Brody's (1995) study constituted a fortuitous sample of volunteer participants, not statistically representative of all primary caregivers of disabled elders.

Boaz and Muller (1991, 1992), using nationally representative data on primary caregivers from the 1982 NLTCS/ICS (which included a small sample of former as well as current caregivers), found no association between caregivers' employment status and their decisions to quit caregiving. They did find, however, that employed caregivers

of ADL-impaired elderly adults reported providing significantly fewer hours of help than their counterparts who did not work outside the home. Because of the way data were collected in the 1982 NLTCS, Boaz and Muller were unable to investigate how the fewer hours provided by employed as compared to nonemployed caregivers affected disabled elders' total hours of help from paid as well as unpaid caregivers. More recently, Boaz (1996) used data from the 1989 NLTCS to examine the extent to which the relationship between full-time market work and informal caregiving changed between 1982 and 1989. Although a somewhat higher percentage of primary caregivers of ADL-impaired elders were employed full-time in 1989 as compared to 1982, the average number of hours of help provided by these caregivers did not change. This study only examined hours of care provided by full-time employed primary caregivers; limitations on data collected in the 1982 NLTCS precluded investigation of the effect of primary caregivers' employment status on hours of paid care, hours of care from secondary informal caregivers, or total hours of care from all sources.

Additionally, Kasper, Steinbach, and Andrews (1990) used the 1984 longitudinal follow-up to the 1982 NLTCS to look for predictors of nursing home placement. It was hypothesized that primary caregivers' employment might create added stress resulting in "caregiver burnout." However, primary caregivers' employment status in 1982 was not found to be associated with increased likelihood of nursing home placement among disabled elders between 1982 and 1984.

ANALYTIC FOCUS

The primary focus of the analyses presented in this study is on the relationship between the employment status of elderly disabled persons' female primary caregivers (FPCGs) and the amount (weekly hours) of personal assistance that disabled elders living in the community receive--in total and from various sources, including the FPCG, secondary informal caregivers, and formal (i.e., paid) providers.

Ours is a topic that, to our knowledge, other researchers have not previously investigated--and, indeed, could not have investigated because the data needed for such an analysis were not available prior to the 1989 NLTCS/ICS. Prior studies on the effects of women's employment on caregiving have focused on the help that an employed, contrasted with an unemployed, primary caregiver personally provides or on help provided by particular categories of helpers (e.g., married daughters) when they are employee or not employed. Our objective is to investigate how the female primary caregiver's employment affects the total amount of weekly assistance that disabled elders receive and the differential amounts contributed by various sources, including the primary caregiver herself, but also secondary informal helpers, and paid caregivers.

In principle, various combinations of informal and formal help can be deployed to meet the needs of disabled elders living in the community. Previous research has established that most elderly persons have a network of potential helpers who, because of kin or friendship ties, might be counted on to provide some level of informal care if and when these elders become functionally disabled (Boaz & Hu, 1997; Stone & Kemper, 1989). At any given point in time, one member of the network takes on the leadership role, i.e., becomes the disabled elder's primary informal caregiver (PCG). Other network members may become active as secondary helpers who provide more limited or specialized forms of assistance or who can be called upon to fill in for the primary caregiver when necessary. Still others may be "reserve helpers" who only become actively involved in caregiving when existing primary and secondary caregivers drop out or additional helpers become necessary.

In addition, informal caregiving may be supplemented by paid assistance. Access to paid assistance from government sources at no cost to the disabled elder or the family is sometimes available from Medicare, Medicaid, or other state/county programs. However, public programs have eligibility criteria (e.g., having a need for skilled care in the case of Medicare home health or meeting disability severity and means tests for Medicaid) and coverage limits. Paid assistance can also be purchased out-of-pocket by disabled elders or their family caregivers. Liu, Manton and Liu's (1965) and Liu and Manton's (1994) analyses of payment sources for formal help in the 1982 and 1989 NLTCS found that approximately 50 to 60% of the formal home care services used by disabled elders living in the community were paid for out-of-pocket, whether in whole or in part. Although the decision to purchase paid assistance is likely to be influenced by its perceived affordability, use of paid help may also be affected by how much unpaid help the various members of the informal network can contribute.

Spouses usually, if available, will take on the primary caregiver role, and when a spouse is not available, an adult daughter is most likely to do so. However, not all disabled elders have spouses or daughters and in many such cases other family members and sometimes even friends fill the PCG role. In terms of making it possible for a severely disabled elder to avoid entering a nursing home or other residential care facility, it does not matter which member of the informal network acts as PCG as long as that person meets the disabled elder's assistance needs.

Attributes of potential PCGs such as geographic proximity, health status, and competing demands on their time (e.g., other family responsibilities and employment) are important in determining which member of the informal network assumes the PCG role. Indeed, these factors may dictate selection of someone other than a spouse or an adult daughter even if one of these family members is available and willing. In the descriptive phase of our analysis, we will briefly explore the effect of employment in determining who becomes a disabled elder's FPCG by looking at whether women who have assumed the primary caregiver role for a nationally representative sample of disabled elders are less likely than women in their age group in the general population to be in the labor force. However, our main focus is on how the employment of a woman who has taken on the PCG role affects the total amount of hours of help that a disabled elder receives and from what combination of sources.

The portion of the total assistance a disabled elder needs provided by a PCG can be conceptualized partly as a function of time constraints--including time spent at work--on the PCG's availability and partly as a function of how much help the disabled elder requires. Thus, when caregiving demands impinge on an employed FPCG's work schedule, she may have to decide whether and how much to cut back hours of work in order to provide care herself or, alternatively, whether and how much supplemental help she may be able to obtain from other informal helpers, paid home care workers, or both. A key goal of our analysis is to understand more about the dynamics of this trade-off.

In descriptive terms, we will compare how many hours of informal care the average employed versus nonemployed FPCG provides and how many hours of care the average full-time versus part-time employed FPCG provides--in relation to disabled elders' level of disability. In multivariate analyses, we will attempt to specify the point at which the average employed FPCG's hours of work begin to conflict with her ability to meet a disabled elder's needs as well as how an FPCG's commitment to balancing both work and caregiving responsibilities affects the likelihood of a disabled elder receiving supplemental assistance from other paid and unpaid helpers.

DATA

Our analyses employ data from the 1989 National Long-Term Care Survey (NLTC) and its companion Informal Caregivers Survey (ICS). These databases provide detailed descriptive data about a nationally representative sample of ADL and/or IADL disabled elders (the NLTC) and a statistically valid subsample of their primary informal caregivers (the ICS). The analyses presented in this article focus on dyads of disabled elders and their female primary caregivers, with the data on the disabled elders drawn from the main NLTC and the data on their female primary caregivers drawn from the ICS.

Although the 1989 NLTC/ICS largely replicated the types of data collected in the 1982 NLTC/ICS and the 1984 NLTC, it also expanded considerably upon earlier data collection efforts with respect to measuring the assistance that disabled elders receive from various sources. Thus, the 1989 NLTC and ICS are the first nationally representative databases to collect detailed, task-specific information on hours of service received by disabled elders from all caregivers, both formal and informal. These data make it possible to examine the effect of primary informal caregivers' employment status on *total* hours of help received by disabled elders as well as on hours of help provided by particular caregiver including the primary caregiver, secondary informal helpers, and paid home care workers. The estimates of hours of care received from various sources come from the main NLTC. That is, they are supplied by the care recipients rather than the caregivers except in cases where the care recipient could not be interviewed and a proxy respondent (who may or may not also be the care recipient's PCG) was interviewed. Questions about who provides regular help and how many hours of help they provided are nested into the batteries of detailed questions regarding need for and receipt of human assistance with Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs).

The 1989 Community Detailed National Long-Term Care Survey has an unweighted *N* of 4,463. Of these 4,463 sample persons (SPs), 3,248 had a chronic disability (i.e., a disability lasting three months or more) in at least 1 of 6 ADLs or physiological incontinence and/or a disability in at least 1 of 9 IADLs. We excluded SPs who reported having one or more ADL impairments but also reported that they were able to perform these ADL tasks independent of human assistance through use of assistive devices (e.g., a grab bar in the bath, toilet rails, canes and walkers). The IADL list excludes heavy housework.

Among the 440 chronically disabled SPs who did not identify informal helpers, over half (230) were receiving help but relied exclusively on paid helpers. Of the remaining 210 SPs for whom no helper was identified, 137 met the chronic disability criterion only because they reported chronic incontinence. However, in response to a follow-up question, these individuals reported that they managed their own incontinence (e.g., used continence pads, changed their own ostomy bags). Of the remaining 73 SPs, only 4 actually reported "unmet" ADL needs; that is, they required human

assistance with one or more ADL tasks but had no one helping them. An additional 20 SPs reported receiving help from someone with at least one ADL, although they did not identify a regular helper. The other 49 SPs who did not identify regular helpers were persons in need of IADL assistance only at low levels. Even if all 73 of these individuals are counted as persons who require human assistance but receive no help, they account for a negligible percent of the SPs who met our chronic disability and need criteria.

The extreme rarity of disabled elders living in the community who reported the need for human assistance but had no access to paid or unpaid helpers strongly suggests that a lack of access to helpers is incompatible with continued community residence for such individuals. Moreover, closer examination of the small percentage of SPs who reported relying exclusively on paid help revealed that most were only mildly disabled and therefore reported receiving comparatively few hours of weekly help (Jackson, 1992). At very high levels of disability, exclusive reliance on paid help becomes prohibitively expensive for most elders and their families. For example, 1989 NLTCS SPs with 3 or more ADL disabilities reported using an average of 70 hours of help per week (Jackson & Doty, 1995).

The primary caregivers surveyed in the ICS were a representative subsample of the primary caregivers identified in the NLTCS. Of the 2,808 SPs who met our disability criteria and had PCGs, 818 (29%) were sampled in the ICS. Because our research focus was on the effects of female labor force participation on hours of care received by disabled elders, we further narrowed our sample for the multivariate analyses to the FPCG/CR pairs ($N=587$).

RESULTS

Descriptive Findings

Table 1 summarizes major characteristics of CRs and PCGs in the total sample of CR/PCG pairs ($N=818$, including both male and female PCGs). The majority of CRs are female, White, and unmarried. Their average age is 78.3 years. As a group, CRs are moderately impaired with average ADL and IADL scores of 1.5 and 4.2, respectively. About 13% are incontinent and depend on others to manage this impairment. Slightly more than one quarter of CRs are cognitively impaired.

The average age of PCGs is 60.3 years. About two fifths are married to the CR and over half (68.4%) live with the CR. Nearly a third of PCGs rate their health as fair or poor. As expected, the majority of PCGs are women (73.5%).

As shown in Table 2, CRs received a mean of 38.4 hours of help weekly from all sources, of which 28.7 hours were provided by PCGs, 5.7 hours by secondary informal helpers, and 4 hours by paid workers. The distribution of paid help was, however, skewed: only 27% of CRs (28% of CRs with FPCGs) received any paid services at all. Among those CRs with FPCGs who used any paid services, the average weekly number of hours of paid help was 16.7--in relation to 52.7 hours of total help, including an average of 29.7 hours from the FPCG and 6.3 ours from secondary informal helpers.

TABLE 1. Characteristics of Primary Caregivers and Their Care Recipients ($N=818$)	
	Total
CARE RECIPIENTS	
Mean age	78.3
% Female	64.7
% White	82.2
Mean number of ADLs/5	1.5
Mean number of IADLs/9	4.2
% Others manage incontinence	13.0
% Cognitively impaired	26.5
% Married	46.5
% On Medicaid or SSI	23.4
% \$15,000+ income	27.4
PRIMARY CAREGIVER CHARACTERISTICS	
Mean age	60.3
% Female	73.5
% Spouse of CR	40.6
% Fair/poor health	31.3
% CR lives with PCG	68.4
% Work	31.3
% Employed full-time	21.9
% Employed part-time	9.3
Mean hours worked (for employed work)	36.9

Employed PCGs provided a mean of 17.8 hours of help per week; those not in the labor force provided a mean of 32.8 hours. Full-time employed PCGs provided an average of 16.2 hours of help weekly and part-time employed PCGs provided 21.4 hours (Table 2).

A minority (31.3%) of the PCGs were employed (21.9% full-time; 9.3% part-time). Employed PCGs reported working an average of 36.9 hours per week. Not being in the labor force is often age-related. As shown in Table 3, nearly half (49.1%) of PCGs were age 65 or older (i.e., retirement age). Among PCGs aged 18 to 64 of both sexes, a little over half (53.2%) were employed. However, employed PCCs were overwhelmingly female. This is because most male caregivers are aged 65 and older. Fewer than 10% of PCGs are males of working age; hence, the sample contained very few employed male PCGs.

All sources	38.4
Primary caregiver	29.7
Unemployed primary caregiver	32.8
Employed primary caregiver	17.8
Full-time	16.2
Part-time	21.4
Secondary informal caregiver	5.7
Paid caregiver	4.0
Nonprimary	9.7
Male relative secondary	2.0

Hours of care provided by PCGs increased with CRs' severity of disability. Table 4 displays the differences in mean hours of weekly help by employment status in relation to care recipient ADL disabilities. The differences in weekly hours of help provided by employed and nonemployed PCGs were greatest among those caring for the least and most disabled care recipients. A comparison of average hours of paid care by PCG employment and CR disability level (table not shown but available on request) found that hours of paid care increased with CR disability level. At lower levels of CR disability (fewer than 3 ADL impairments) differences in hours of paid care between CRs with employed and nonemployed PCGs were small (CRs of nonemployed PCGs used more hours). However, when CRs had 3 or more ADL impairments, CRs with employed PCGs received substantially more hours of paid help than CRs with nonemployed PCGs.

Age	Males	Females	All
<34	1.3%	3.3%	4.6%
35-44	1.7%	9.6%	11.3%
45-54	4.0%	12.1%	16.1%
55-64	3.0%	16.0%	19.0%
65+	16.3%	32.8%	49.1%
All Ages	26.2%	73.8%	100.0%

Among the 41% of all PCGs who are women of working age (i.e., 18 to 64), 52.4% are employed either full- or part-time. Because our sample includes only women who have agreed to be the PCG for a disabled elder, we can offer only an indirect measure of the effect of employment on the selection process for this role. Table 5 compares the employment rate of FPCGs with that of similarly aged women in the U.S. population as a whole in 1989. Based on these comparisons, it appears that FPCGs are less likely to be employed than same age women in the general population--but on somewhat less likely. The greatest difference is in the 45 to 54 age group.

Number of ADLs	Working	Nonworking
0 ADLs	10.42	19.84
1 ADLs	14.7	27.80
2 ADLs	25.08	30.62
3 ADLs	32.35	39.25
4 ADLs	38.73	52.07
5 ADLs	37.32	69.97
NOTE: $F=79.56, p<0.01$		

Our comparison between employment rates of FPCGs and their age peers in the general population does not adjust for the differential risk of having an elderly relative in need of care. However, it is important to note that just about everyone is a member of an actual or potential caregiver network for one or more elderly persons, even if the probability of assuming the PCG role is greatest for immediate relatives. Contrary to the popular stereotype, only 53% of the working age FPCGs in our sample are daughters. Indeed, among FPCGs in the 18 to 64 age category, fully 25% are neither wives, daughters, nor daughters-in-law. We interpret this pattern to indicate that informal support networks really do try hard to meet the needs of their disabled elders in the community--so much so that, in a surprisingly high number of cases, nonimmediate relatives and even friends will take on the PCG role when (presumably) the wives, daughters, and daughters-in-law are unavailable.

TABLE 5. Employment Rates		
Age	Female Primary Caregivers	U.S. Female Population*
25-34	62.6%	73.5%
35-44	69.6%	76.0%
45-54	55.5%	70.5%
55-64	37.9%	45.0%
65+	8.3%	8.4%

* Hayghe, 1994.

The 1989 NLTCS Informal Caregiver Survey included a number of questions about work/caregiving conflicts. Over half (54.4%) of employed FPCGs reported making accommodations of one sort or another to manage work/caregiving conflicts (the most frequent being rearranging their work schedules). As previously noted, most employed FPCGs reported working full-time (35 hours or more per week) and only a minority of these workers (16.4%) indicated that they were working fewer hours than they would have in the absence of eldercare responsibilities. In contrast, nearly half (45%) of the part-time employed FPCGs, said that they were working fewer hours because of caregiving.

Multivariate Analyses: Methods and Findings

Multivariate regression analyses were used to explore differences among care recipients of employed and nonemployed FPCGs in terms of total hours of help received on a weekly basis and, separately, from primary informal caregivers, secondary informal helpers, and paid helpers. Bivariate analyses had already indicated that the number of hours that PCGs personally contributed were strongly related both to CRs' level of disability and PCGs' employment status. Clearly, employed PCGs were more time constrained than nonemployed PCCs in their ability to respond to the escalating time demands associated with providing care to severely disabled elders (those with 3 or more ADLS, who are at greatest risk of nursing home entry). Thus, a main goal of our multivariate regression analyses was to quantify the effect of employment on hours of help provided by paid and unpaid sources of assistance in addition to the FPCG herself, while holding elders' disability status and certain other FPCG and CR characteristics constant.

Six dependent measures are examined in the regression equations, all of which indicate weekly hours of care given to the care recipient by various types of caregivers for ADL and IADL assistance. These measures include hours of care from: (a) female primary caregivers; (b) secondary informal (unpaid) caregivers; (c) formal (or paid) caregivers; (d) all sources other than the primary caregiver; (e) male relatives who are secondary informal caregivers; and all sources, both formal and informal.

Characteristics of both the care recipient and primary caregiver were treated as controls in all the regression equations. Care recipient characteristics include age, sex (0 = male; 1 = female), race (0 = nonWhite; 1 = White), number of ADL disabilities out of 5, number of IADL disabilities out of 9, cognitive status (0 = not impaired; 1 impaired),

bladder/bowel continence management (0 self = management; 1 = others manage), Medicaid/SSI status (0 = not receiving Medicaid; 1 = receiving Medicaid); and 1988 income (0 = <\$15,000; 1 = ≥\$15,000). Primary caregiver characteristics included age, relationship to the care recipient (0 = nonspouse; 1 = spouse), perceived health status (0 = excellent/good; 1 = fair/ poor), and whether the caregiver lived with the care recipient (0 = no; 1 = yes).

In our first round of modeling, we explored several measures of FPCG employment status as the independent variable. In one set of models, the indicator was whether the primary caregiver was employed or not employed (0 = nonemployed; 1 = employed). In a second set of models, the employment indicators were two dummy variables indicating whether the FPCG worked full-time, 35 or more hours per week, or part-time, fewer than 35 hours per week (1 = yes; 0 = no), or was not in the labor force (comparison category). In a third set of models, the employment indicator was FPCG hours of work (0 for FPCGs not in the work force).

Because it was possible that hours of care and per employment were jointly determined, we for the potential endogeneity of caregiver employment in the hours of care equations using the Wald statistic devised by Spencer & Berk (1981). The Wald statistics for the caregiver hours equations were formed as a function of the differences in the ordinary least squares (OLS) and two-stage least squares (2SLS) parameter estimates and their associated variance-covariance matrices. The OLS estimates treat caregiver employment as exogenous while the 2SLS estimates treat caregiver employment as endogeneous. Thus, a statistically significant Wald test indicates the presence of endogeneity and the need for a simultaneous equations model. The instrumental variables used in estimating the 2SLS models of caregiver hours included a set of explanatory variables for caregiver employment similar to those used by Boaz (1996) in addition to the explanatory variables in the OLS versions of these equations. In our first set of regression models, none of these tests indicated endogeneity of caregiver employment in the caregiver hours equations.

A second methodological issue was the clustering of zero hours of care for secondary, paid, nonprimary, and male secondary caregivers. The clustering of observations at specific points, such as zero, introduces correlation between the residuals and the explanatory variables in regression models. This correlation, in turn, introduces bias into the parameter estimates. To rectify this problem, these equations were estimated using tobit analysis (Greene, 1993). The caregiver hours equations for the primary caregiver and hours of care received from all sources were estimated using OLS regression.

Sampling weights that take into account the complexity of the sampling frame were applied to all analyses. In addition, OLS regression analyses were conducted using the SUDAAN software package for the OLS models for FPCG hours and hours from all sources (Shah, Barnwell, Hunt, & Lavange, 1991). SUDAAN takes the design effect associated with the sampling design into account and recalibrates standard errors. This adjustment is necessary because one cannot assume simple random

sampling in calculating standard errors for estimates from complex surveys such as the NLTCS/ICS; such an assumption typically produces underestimates of standard errors as a result of correlation among observations introduced by complex sampling techniques. If standard errors are not adjusted then one runs the risk of detecting a significant result, e.g., a significant beta coefficient in a multiple regression model, when in fact the coefficient is not statistically significant due to a larger "real" standard error than calculated by most statistical software packages such as SAS or SPSS.

Results from the models using employed/nonemployed as the measure of FPCG employment are shown in Table 6. FPCGs who were employed were found to provide significantly fewer hours of help (6.66) than FPCGs not in the labor force. At the same time, CRs of employed FPCGs received significantly more hours of help (6.67) from sources other than the FPCG (including hours from both paid and informal secondary helpers) as compared to CRs of nonemployed FPCGs. CRs of employed FPCGs did not receive significantly fewer total hours of assistance than CRs of nonemployed FPCGs. Thus, increased use of combinations of paid and secondary informal help appeared sufficient to compensate for the decreased availability of employed FPCGs.

TABLE 6. Predictors of Care Recipient Hours of Care By Source: Female Primary Caregiver/Care Recipient Pairs (N=587)						
	Employment Variable: Primary Caregiver Works/Does Not Work					
	Primary^a	Secondary^b	Paid^b	Nonprimary^b	Male Relative Secondary^b	All Sources^a
CARE RECIPIENT CHARACTERISTICS						
Age	-0.17	0.46	0.56*	0.64*	-0.11	0.13
Female	-5.47	-8.89*	1.21	-5.65*	-1.15	-5.71
White	8.31*	-3.92	10.92*	-0.76	2.20	12.02*
Number of ADLs	3.57*	2.56*	4.93*	4.53*	1.69*	6.90*
Number of IADLs	3.45*	1.77*	2.15*	2.10*	1.00*	4.89*
Cognitively Impaired	0.34	3.47	-1.89	2.58	3.34	2.28
Others manage incontinence	1.49	-7.66	9.63	1.44	-4.85	3.00
\$15,000+ income	-6.26	-7.45*	4.31	-3.20	-4.49	-6.33
On Medicaid/SSI	1.81	1.04	6.77	3.01	-0.86	2.99
PRIMARY CAREGIVER CHARACTERISTICS						
Age	-0.11	-0.24*	0.52*	0.04	-0.22	-0.18
Care recipient's spouse	12.05	-8.30*	-9.39	-11.04*	-6.56*	11.81
Works	-6.66*	4.23	9.08	6.67*	1.00	-1.38
Poor/fair perceived health	-1.24	-0.70	-0.50	-0.80	-0.64	-1.83
Lives with care recipient	13.73*	0.51	-19.77*	-6.79*	7.14*	10.33*
Intercept	15.24	-31.34*	-118.21*	-61.34*	-3.64	-9.34
Sigma	---	22.45*	31.58*	25.11*	17.47*	---
* $p \leq 0.05$						
a. Ordinary least squares regression weighted with design effect. Estimates run in SUDAAN.						
b. Tobits run in LIMDEP. Standard errors adjusted by using a ratio of OLS weighted SEs divided by OLS weighted with design effect SEs.						

We also included a model that specifically focused on the involvement of male secondary helpers (such as FPCGs' husbands and brothers). Hours of care from male secondary helpers did not increase when FPCGs were employed. However, hours from male secondary helpers were significantly greater when CRs had more ADL and IADL disabilities. Male secondary helpers also contributed more hours when FPCGs lived in the same household with the CR (the most plausible interpretation of this finding is that FPCGs husbands help out more when the CR lives in the same household).

Several variables other than FPCG employment also emerged from the analyses as powerful predictors of FPCG hours of care and total hours of care from all sources. These included: FPCG's age, CR's race, ADL/IADL scores, and living arrangements (FPCG and CR living together or apart), CRs with older FPCGs received fewer hours of help from secondary helpers but more paid hours. White CRs received more hours of help from their FPCGs, from paid sources, and more total hours of help. Higher ADL and IADL scores were associated with more hours of help from the FPCG, secondary informal helpers, paid helpers, all nonprimary helpers, male secondary helpers, and hours received in total. However, neither cognitive impairment nor help from others in managing incontinence predicted more hours of help in any category.

Living arrangement was a very strong predictor of hours of care from various sources and in toto. CRs living with their FPCGs received considerably more total hours of care (10.33 more hours per week) as well as helper hours from their FPCGs as compared to CRs whose FPCGs did not live with them. CRs living with their FPCGs also received significantly fewer weekly hours of paid help. However, when the FPCG was the CR's wife, the CR received significantly fewer hours of help from secondary informal helpers and from sources (both paid and unpaid) other than the FPCG. FPCG's health status was not significantly associated with hours of help from the FPCG, from other sources, or total hours of help.

Whereas higher annual income (greater than \$15,000) was associated with significantly fewer hours of care from secondary informal helpers, there were no statistically significant associations between higher CR income and hours of help from the FPCG, hours of paid help, or total hours of help. It should be noted, however, that the inclusion of income variables in the regression models posed special problems because of potential multicollinearity between the two income variables included in the dataset (CR personal income and FPCG household income) due to the high rate of coresidence among CRs and their FPCGs. In the analyses reported in Table 6, we chose to include only care recipients' income since previous research with the 1982 National Long-Term Care Survey indicated that it is most often the CR rather than the PCG or other family members who makes payments for formal home care.

The Relationship Between Hours of Work and Hours of Care

Working part-time is often viewed as the best strategy for women who want to be employed but also want to maximize their personal involvement in childcare or eldercare. However, in our first round of modeling, the models using the full-time/part-time dummy variables as the indicator of employment (results not shown here but available upon request) yielded results that were counterintuitive to expectations about the relationship of part-time employment to hours of informal care (only part-time employed FPCGs appeared to provide significantly fewer hours of care compared to the nonemployed FPCGs). These results (also not shown here but available upon request) suggested that the relationship between more FPCG hours of work and hours of care received by the CR was nonlinear. In an effort to streamline our approach to measuring the impact of FPCGs' employment on hours of care and capture the nonlinear relationship between FPCGs' hours of work and hours of care, we proceeded to a second round of modeling that incorporated an "hours of work squared" term into the regressions using hours of work as the employment variable.

Because it was possible that hours of care and caregiver employment were jointly determined, we tested for the potential endogeneity of caregiver employment in the total and primary caregiver hours of care equations. This was done using a version of the Hausman test which included predicted values for employment hours and hours-squared, estimated residuals from regression models of employment hours and hours-squared, along with estimated equations. *T* statistics for the two residual variables in each model indicated that both employment hours and hours squared were endogenous to caregiver hours in the total caregiver hours and primary caregiver hours equations. Because of these findings, the total and primary caregiver hours equations were reestimated using two-stage least squares. The resulting 2SLS models were virtually identical to their ordinary least squares counterparts. (Due to space limitations, we do not report the results for the employment hours and hours-squared equations used for the endogeneity tests and in estimating the 2SLS models. However, interested readers these results from the authors.) Briefly, our specifications of the employment hours equations included variables for caregiver age, number of children, education, income, gender, race, ADLS, and had an indicator for whether the care recipient received help from others. In addition to these variables used by Boaz (1996), we also included dummy indicator variables for region as a very crude proxy of regional labor market conditions. In the 2SLS procedure, the explanatory variables for the employment hours and hours-squared equations also included explanatory variables from the caregiver hours equations (i.e., cognitive impairment, Medicaid/SSI status, and management of incontinence of the care recipient, as well as the caregiver's relationship to the care recipient, caregiver perceived health status, and whether the caregiver lived with the care recipient).

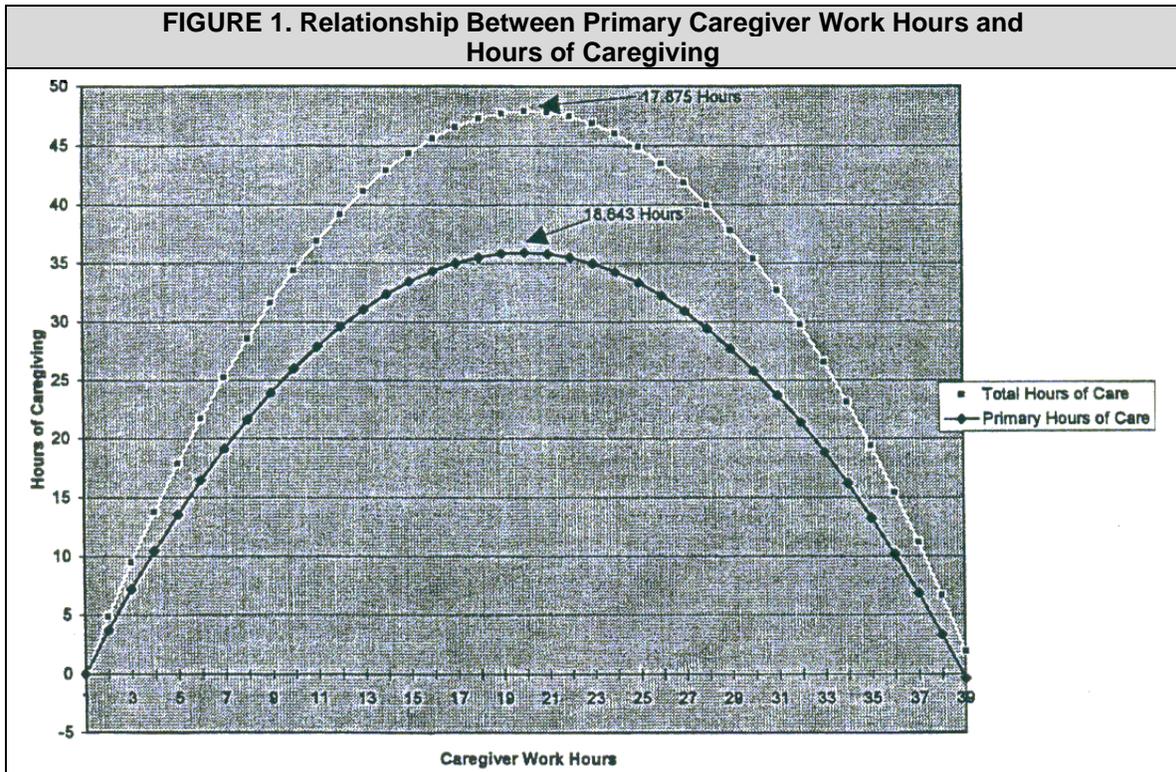
We are unaware of software capable of adjusting the standard errors of 2SLS or tobit models for design effects. Because the 2SLS and OLS models for the total caregiver hours and primary caregiver hours equations were so similar, we used SUDAAN to adjust the OLS models for design effects. No adjustments for the possible

endogeneity of caregiver and employment hours, or design effects, were made for the tobit models. As a consequence, the tobit results are useful only to inform our interpretations of the total and primary caregiver hours equations.

The results are presented in Table 7 and Figure 1. Table 7 indicates that a nonlinear relationship exists not only between hours of FPCG employment and FPCG hours of care but also between FPCG hours of employment and total hours of care received by the disabled elderly CR. The negative signs associated with the hours-squared term indicate that there is a positive relationship between hours of work and hours of care, i.e., the more hours of work, the more hours of care provided by the FPCG and more total hours of care received by the CR--up to a point. Then, the relationships turn negative indicating that the more hours worked, the fewer hours of care provided by the FPCG and the fewer total hours of care received by the CR.

TABLE 7. Predictors of Care Recipient Hours of Care By Source: Female Primary Caregiver/Care Recipient Pairs (N=587)						
	Employment Variable: Predicted Hours of Work Per Week and Predicted Hours of Work Per Week Squared					
	Primary^a	Secondary^b	Paid^b	Nonprimary^b	Male Relative Secondary^b	All Sources^a
CARE RECIPIENT CHARACTERISTICS						
Age	-0.06	0.38*	0.55	0.55*	-0.09	0.24
Female	-6.74	-6.60	2.94	-2.85	0.37	-7.22
White	12.40*	0.77	10.79	2.47	6.71*	17.24*
Number of ADLs	2.93*	2.56*	5.61*	4.87*	1.27	6.10*
Number of IADLs	3.25*	1.89*	2.92*	2.59*	1.38*	4.73*
Cognitively Impaired	1.85	3.88	-1.94	2.81	4.82*	4.05
Others manage incontinence	0.43	-6.32	5.22	-0.54	-4.57	1.16
\$15,000+ income	-6.42	-5.94*	5.81	-1.77	-1.66	-6.31
On Medicaid/SSI	1.02	1.05	7.49	3.38	0.43	1.98
PRIMARY CAREGIVER CHARACTERISTICS						
Age	-0.57*	-0.45*	0.82*	-0.05	-0.42*	-0.69*
Care recipient's spouse	7.60	-7.16	-4.75	-7.45	-6.89	5.82
Poor/fair perceived health	-2.38	-0.80	0.24	-0.81	-0.69	-3.08
Lives with care recipient	18.83*	2.40	-24.27*	-7.60*	7.75*	16.55*
Predicted hours worked	3.79*	2.72	-0.65	1.14	2.86	4.99*
Predicted hours worked squared	-0.10*	-0.06	0.03	-0.02	-0.07*	-0.13*
Intercept	38.37*	-16.52	-146.58*	-55.51*	2.63	17.18
Sigma	---	23.01*	31.58*	25.45*	18.75*	---
* $p \leq 0.05$						
a. Ordinary least squares regression weighted with design effect. Estimates run in SUDAAN.						
b. Tobits run in LIMDEP. Standard errors adjusted by using a ratio of OLS weighted SEs divided by OLS weighted with design effect SEs.						

Figure 1 graphs these relationships. It shows the pivotal point for both hours of care from the FPCG and total hours of care received by the CR to be at approximately 18 hours of work. Taken together, Table 7 and Figure 1 suggest that when FPCGs work less than the equivalent of a "half-time" job, they actually provide more hours of care. (This may be evidence that work provides respite--and a defense against engulfment by the caregiver role--for some employed caregivers.) However, Table 7 and Figure 1 also indicate that when FPCGs work more than "half-time," increased hours of work are associated with significant decreases in both the hours of care that the FPCG provides and the total hours of care that care recipients receive.



DISCUSSION

Overall, increased female labor force participation is having less of an effect on the availability of informal eldercare than many experts predicted. Women's employment outside the home has not limited severely the supply of informal caregivers, despite our finding that disabled elders with employed female primary caregivers tend to use more hours of help from other sources than disabled elders with nonemployed female caregivers. The overall effects of female labor force participation on demand for formal help appear to be mitigated by the possibility that others in the informal network may supply more help when the FPCG is employed.

The conflict between employment and eldercare affects only a minority of primary caregivers and their care recipients at any one point in time because the role of primary caregiver for an elderly disabled person tends most often to be assumed by individuals at a stage of life when they are likely to have left the labor force. Almost half of all primary informal caregivers of disabled elders are aged 65 or older. An additional 19% of PCGs are aged 55 to 64--an age group in which labor force participation begins to decline for reasons unrelated to eldercare responsibilities (e.g., early retirement).

Other findings suggest that what Stohs (1994) has termed women's traditional "ethic of care" still strongly influences women's behavior with regard to eldercare. Working age male primary caregivers; were rare and employed male caregivers were even more rare. Thus, our data confirm the popular belief that, except when husbands are still alive to care for their wives, female relatives are much more likely than male relatives to become primary caregivers of disabled elders. Moreover, female primary caregivers appear to be only slightly less likely to be out of the labor force than their age peers among women in the general population. This suggests that women in the informal support network who are not employed may be more likely to take on the primary caregiver role, but because of other factors that may limit or affect choice of the primary caregiver, employment is only a weak influence.

The strongest evidence that women's "ethic of care" (Stohs, 1994) still holds sway even among employed women is that employed female primary caregivers provide high weekly amounts of care to their disabled elderly care recipients (an average of 18 hours for all employed FPCGs, 16 hours for full-time employed FPCGs, and 21 hours for part-time employed FPCGs). Employed FPCGs caring for severely disabled elders (those with 3, 4, and 5 ADL impairments) provide, on average, between 32 and 39 hours of care per week.

Multivariate analyses indicate that employed female primary caregivers compensate for the time constraints employment puts on their personal availability by accessing other sources of help, from paid helpers or from a combination of paid and secondary informal helpers. In our first round of modeling, this strategy appeared successful insofar as no significant differences emerged with respect to the total hours of care received by care recipients of employed and nonemployed FPCGs.

However, we improve our understanding of the difficulties facing employed FPCGs by also taking into account that the number of hours per week a female primary caregiver works affects how many hours of assistance CRs receive. The results from our second round of modeling suggest that FPCGs who are employed more than half-time experience greater difficulty providing or arranging for the total hours of assistance needed by disabled elders. Bivariate analyses had already pointed to the problem that, at higher levels of CR disability (the threshold for “severe” disability appears to be 3 or more ADL disabilities, which is also a commonly used indicator of appropriateness for nursing home placement), employed FPCGs run up against the limitations that being employed imposes on their ability to increase the amount of time that they personally devote to providing eldercare. Employed FPCGs in such a situation confront a choice between cutting back their hours of work to free up more time for caregiving or accessing larger amounts of supplemental help. At this point, however, more than modest amounts of paid help are likely to be required to compensate for limitations on the employed FPCG's own availability.

It is, of course, important to note that our analysis does not purport to show how many total hours of assistance are truly required to meet the care needs of disabled elders. Almost by definition, disabled elders require more hours of assistance in relation to the severity of their disability. However, the fact that living arrangement--independent of the CR's level of disability--emerges from our models as a very powerful predictor of total hours of assistance, independent of the CR's level of disability, makes it impossible to derive disability-related normative standards of how many hours are truly required to meet disabled elders' needs based on existing patterns of caregiving behavior. The importance of living arrangement in predicting total hours of care also suggests that, for many FPCGs, trade-offs that might otherwise be required between cutting back on employment and hiring paid workers may be avoided or at least mitigated if the possibility exists of establishing a joint household with the CR. The results from our models also lead us to hypothesize that if a female primary caregiver caring for a severely disabled elder wants to obtain more supplemental informal help from her husband (and she may feel she needs more such help from her husband if she is employed and does not wish to quit her job or severely limit her hours of employment), she is most likely to obtain his help if she can bring the care recipient into her home.

The results from our analyses point toward new lines of research focusing on the role that bringing a disabled elder into a primary caregiver's home or, alternatively, having the caregiver share the disabled elder's home may play in reducing demand for paid help and, if the caregiver is employed, in reducing the need to cut back on hours of work. Other new lines of research would include examining in much greater detail the role of income, which did not prove to be a significant predictor of use of paid care in our models. It may be that income is a key factor only in particular types of caregiving situations. We hypothesize, for example, that, income may play a significant role in enabling disabled elders to maintain independent households (i.e., avoid having to move in with adult children or other nonspouse primary caregivers). At high levels of disability, disabled elders are likely to require quite substantial amounts of paid care to

continue to live alone in their own homes--so affordability becomes an issue. Are employed female caregivers more likely to have higher incomes and therefore to be more willing to contribute toward the cost of the paid care necessary to maintain a disabled elder's separate household? Sample size considerations restrict the possibility of carrying out these kinds of subgroup analyses with data from the 1989 National Long-Term Care Survey and its Informal Caregiver Survey. The 1994 National Long-Term Care survey did not include an Informal Caregiver Survey. It would be highly desirable for the next (1999) round of the National Long-Term Care Survey to include an Informal Caregiver Survey and to expand the sample size of caregivers interviewed to include, at a minimum, all primary caregivers of NLTCs respondents.

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THE IMPACT OF FEMALE CAREGIVERS' EMPLOYMENT STATUS ON PATTERNS OF FORMAL AND INFORMAL ELDERCARE

Pamela Doty, Ph.D.

Office of the Assistant Secretary for Planning and Evaluation

Mary E. Jackson, Ph.D.

William Crown, Ph.D.

The MEDSTAT Group

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