Bargaining Power, Parental Caregiving, and Intergenerational Coresidence

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Objective. To examine the effect of changes in parent–child coresidence on caregiving decisions of non-resident siblings over a 5-year period while controlling for characteristics of the elderly parent and adult children in the family network.

Method. We use difference-in-difference models applied to Health and Retirement Study- Assets and Health Dynamics of the Elderly data to test the hypothesis that the formation of a joint household between a parent and one of her children raises the bargaining power of non-resident siblings, who then reduce their care to the parent. Similarly, the dissolution of a parent–child household is expected to increase the bargaining power of the child who no longer coresides with the parent relative to her siblings.

Results. We find that children whose parent and sibling begin coresiding during the study period are less likely to provide care and provide fewer hours of care than children whose parents never coresided with a child. Adult children whose parent cease coresiding with a sibling, on the other hand, have a higher likelihood of providing care and provide significantly more hours of care relative to children whose parents either coresided with a sibling in both time periods or never coresided with a child.

Discussion. Meeting the needs of the growing elderly population while maintaining them in the community is a particular focus of long-term care policy. To the extent that shared living is an important component of such care, the observed sensitivity of non-resident children’s caregiving efforts has implications for the well-being of both disabled parents and their coresiding adult children.

Key Words: Aging—Caregiving—Family bargaining—Intergenerational coresidence.
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Background
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theoretic models are also well suited to examining situations
involving few “actors,” such as families, where the reactions
of others cannot be neglected. Second, our analysis focuses
on the interplay between siblings in a longitudinal frame-
Taking advantage of information collected in a large
and nationally representative panel of elderly persons and
all of their adult children, we examine the effect of changes
in parent–child coresidence on caregiving decisions of non-
residential siblings over a 5-year period. Given evidence that
partnered (e.g., married) elderly persons most often receive
care from their partners rather than from children (Dwyer
& Coward, 1991; Pezzin, Pollak, & Schone, 2009), and that
coresidence of elderly parents with adult children usually
does not occur until one parent has died (Boaz, Hu, & Ye,
1999), we focus on coresidence and care decisions of the
adult children of unpartnered disabled elderly parents.

Background
A better understanding of intergenerational family behav-
ior requires greater insight into family members’ motiva-
tions for providing assistance to one another. A number
of perspectives regarding motives for adult child to parent
transfers have been advanced in recent years by various
disciplines. Within the sociological literature, the notion
of solidarity has been a dominant perspective from which
to explore intergenerational relations. Families are charac-
terized as exhibiting solidarity along a number of dimen-
sions, including the willingness to provide resources to care
for each other (Bengtson, 2000; Voorpostel & Blieszner,
2008). An alternative perspective is the notion of recipro-
city (Silverstein, Conroy, Wang, Giarrusso, & Bengtson,
2002), which can be viewed as grounded in social norms
that obligate repayment of debts (Silverstein, 2005), a con-
cept related to the “support bank” of social psychology
(Antonucci, 1990) whereby a reserve of gifts or goodwill is
produced for consumption over the life course.

Within the economics literature, the leading model of
intergenerational relations posits that family transfers are
driven by caring or “altruistic preferences” of a single deci-
sion maker with the power to impose behavior consistent
with his preferences on all the family members (Becker,
1974, 1991). In this purely altruistic framework, control
of resources within the family is irrelevant because family
resources are pooled, and any governmental efforts directed
at redistribution of resources, including old-age assistance
programs, are ineffective because as they simply “crowd
out” private, altruistically motivated intergenerational trans-
fers. If the altruist makes all decisions in the best interest
of the family as a whole, then there is little difference between
the altruistic framework and the solidarity perspective.
Increasingly, however, evidence showing that intergenera-
tional households do not pool resources and that control of
resources does matter suggests that these households do not
behave in a way that is consistent with the purely altruistic
model (Altonji, Hayashi, & Kotlikoff, 1992; Bianchi, Hotz,
McGarry, & Seltzer, 2008; Brown, 2006; Hayashi, 1995;
Pezzin et al., 2008; Pezzin, Pollak, & Schone, 2007; Pezzin
& Schone, 1999).

In light of empirical findings rejecting “pure altruism,”
other economic models have been developed that allow for
the “impure” or “imperfect” altruism between parents and
children. Some studies have introduced “frictions” (e.g., the
“joy of giving” or incomplete information about other fam-
ily members’ preferences) into the altruism framework and
examined the conditions under which these frictions under-
mine the strong and generally unsupported resource pooling
and neutrality predictions of the pure altruism framework
(ABel & Bernheim, 1991). A second, and more controver-
sial, vein of economic research has departed further from
the assumption of altruism and proposed “exchange” as
a primary motive for intergenerational transfers (Altonji,
Hayashi, & Kotlikoff, 1997; Bernheim, Shleifer, &
Summers, 1985; Cox, 1987; Light & McGarry, 2004).
Although the precise specification of the exchange mecha-
nism differs across studies, it generally reflects one of two
notions: (a) reciprocity, whereby current transfers are made
as a repayment for past transfers or (b) strategic behavior,
whereby current transfers are made in anticipation of future transfers, including bequests. An alternative approach that departs from explicitly assuming altruism or exchange as a motivation but still recognizes the individuality of each family member is the collective model (Alderman, Chiappori, Haddad, Hoddinott, & Kanbur, 1995; Chiappori, 1992), which assumes that family members have different amounts of “bargaining power” relative to others in the family. The relative bargaining power of family members guides their interactions and, in turn, reflected in the family’s allocation of resources. A key implication of all of these models as applied to adult children and their elderly parents is that heterogeneity in family members’ preferences and relative control over resources do determine patterns of intergenerational transfer.

Empirical evidence in favor of any specific hypothesis has been mixed, and a consensus on the most appropriate approach has yet to emerge. In addition, to a large extent, studies have often focused on a particular child and have either ignored other children or simply included variables capturing salient characteristics of the other children in the parent’s network. Only a few studies explicitly model strategic interactions among the children. For example, Heidemann and Stern (1999) and Engers and Stern (2002) allow for the possibility that preferences differ across family members and estimate game theoretic models focusing on the family’s selection of the primary care arrangement among the choices of informal care by one adult child (the “primary” caregiver), institutional care, and independent living in the community with no care provision by any source. Checkovich and Stern (2002) disentangle the living and care arrangement decisions and focus instead on a bargaining model designed to explain the amount of care provided by each adult child. Silverstein, Conroy, and Gans (2008) use a bargaining framework as the theoretic backdrop against which to examine empirically the extent to which filial responsibility affects siblings’ negotiation regarding the division of labor involved in parental care. Specifically, the authors propose that children weigh filial responsibility against the costs of caregiving (captured by geographic distance to the parent) and use this model to explain why children who live relatively close to a parent but have low filial responsibility may choose not to provide care while a child who is farther away but exhibits a high degree of filial responsibility becomes a caregiver. Focusing more explicitly on the interplay among siblings, Pezzin and Schone (2001) propose a bargaining model in which information about the responsiveness of each child’s transfer behavior to that of her siblings generates testable hypotheses about the motives—altruism, reciprocity, or rivalry—for intergenerational transfers. They find evidence of crowding out or substitution of the child’s caregiving efforts based on her siblings’ contributions, a finding supported by the work of Wolf, Freedman, and Soldo (1997). In a study examining siblings’ influence on the caregiving behavior of adult children in Amsterdam, Tolkacheva, van Groenou, and van Tilburg (2010) report a positive association between a child’s caregiving efforts and that of her siblings, a result that the authors interpret as evidence of sibling solidarity. Voorpostel and Blieszner (2008) report evidence of a compensatory mechanism whereby a child’s poor relationship with her parent enhances her receipt of emotional support from her siblings. These authors also find that parental support is a reinforcing mechanism in the siblings’ relationship serving as a demonstration effect of sorts.

**Conceptual Framework**

To motivate our empirical work examining the association between changes in parent–adult child coresidence and the caregiving efforts of siblings, we draw primarily from research within economics that has modeled intrafamily allocation using a game theoretic framework (McElroy & Horney, 1981). Following Pezzin et al. (2007, 2008), we treat family interactions as a two-stage game involving a disabled elderly parent and her multiple (2+) adult children. The first stage determines living arrangements. At the first stage, the children decide, separately and simultaneously, whether to invite the parent to coreside; the parent then chooses among the feasible living arrangements: she can move into a nursing home, live on her own, or accept the invitation of any child who has invited her to coreside. At the second stage, the parent and the children take the living arrangement determined at the first stage as given and make decisions that determine resource allocation under that living arrangement.

The crucial assumptions of this two-stage game are as follows: the first stage involves a big, up-front decision (i.e., whether to coreside) that affects second-stage bargaining power, and family members cannot or will not make binding commitments at the time of the first stage regarding transfers (caregiving) at the second stage. In what follows, we focus on the implications of family bargaining for caregiving if coresidence emerges as the outcome of the first-stage game.

Although it is tempting to assume that when the parent coresides with one of her children, their interactions are the result of a cooperative game, the assumption of efficient outcomes implied by cooperative models has not been well supported empirically (Light & McGarry, 2004; McGarry, 1999; Pezzin & Schone, 1999; Thomas, 1990). To avoid assuming efficiency, we opt for an alternative modeling approach and postulate an “allocation rule” for the coresident household (Chiappori, 1988, 1992). The allocation rule specifies each child’s second-stage behavior as a function of their coresidence status (with the parent) that was determined at the first stage, as well as their economic and demographic characteristics.

With multiple children, allocation within the coresident household plays an important role because each noncoresident child must decide on transfers (of time and/or
money) to the coresident household, taking account of the coresident household’s allocation rule. Empirical work on allocation within households has established that resources controlled by one household member have a different effect on household expenditure and time utilization patterns than resources controlled by other family members (Lundberg & Pollak, 2005; Pezzin & Schone, 1999). For non-coresident family members, monitoring is a crucial issue. For example, a non-coresident child who is altruistic toward the parent may undercontribute to the coresident household relative to what she would contribute if binding, enforceable agreements were possible because of her concern that the coresident child will exploit her position. This result is consistent with the observation that care is usually concentrated and provided by one “primary caregiver.”

Two hypotheses emerge from this analysis. The first suggests that coresidence would strengthen the bargaining power of the non-coresident child and correspondingly weaken the bargaining power of the coresident child. The non-coresident child, knowing that the coresident child cannot easily evict the parent, leave herself, or withhold care may be concerned that her efforts will simply crowd out the efforts of her coresiding sibling. Thus, she will contribute less parental care than she would if the parent did not coreside with any of her children. Similarly, if the parent and coresident child dissolve their joint household, then the child who leaves the joint household would gain bargaining power relative to her siblings, resulting in higher caregiving hours by the other siblings relative to the case where the joint household remained intact (and relative to other children who never had a sibling coresiding with a parent). Our empirical work focuses on testing these hypotheses by examining the extent to which changes in children’s caregiving efforts across survey waves are associated with changes in their siblings’ coresidence with the parent.

**Data Source**

Data for this analysis are drawn from the Assets and Health Dynamics of the Elderly (AHEAD) cohort of the Health and Retirement Study (HRS). The HRS-AHEAD cohort is an ongoing panel that began in 1993 with a nationally representative sample of individuals aged 70 and older living in the community (though there was an over sampling of blacks, Hispanics, and Florida residents). Respondents are resurveyed biannually by the Survey Research Center at the University of Michigan. Because it is a panel, HRS-AHEAD provides information on changes in the economic status of respondents, along with changes in their health, family structure, and living arrangements. Specifically, HRS-AHEAD includes questions in four broad categories: health measures (including activity limitations), income and assets, family structure, and intergenerational transfers (including hours of help from all sources). For each respondent, the biannual survey collects a roster of all household members, regardless of their relationship to the respondent, of all children of the respondent, regardless of living arrangements, and information on all other individuals who provide disability care. We use the full complement of family members, including resident and non-coresident, biological and stepchildren, to identify children who provide care to a disabled respondent in each survey wave.

We work with the subsample of unpartnered respondents with chronic disabilities. We define a respondent as chronically disabled if, in both Wave 1 (1993) and Wave 3 (1998) of the survey, he or she has difficulty with at least one of the five instrumental activities of daily living (IADLs: grocery shopping, preparing meals, taking medications, using a telephone, and managing household finances) or difficulty with at least one of the six activities of daily living (ADLs: transferring, dressing, bathing, toileting, eating, and walking across a room). We further restricted our sample to respondents who report their marital status as widowed or as divorced/separated, who have at least two adult children (over age 18), and who were living in the community in both Waves 1 and 3 of HRS-AHEAD. We then constructed a child-level analysis file by creating individual records for every child identified by an HRS-AHEAD respondent who met our inclusion criteria.

**Variables**

Our dependent variables are indicators of adult children’s informal caregiving to their disabled parents, defined as the provision of help with ADLs or IADLs because of a health problem or disability. We measure both the likelihood of informal care provision (a binary variable taking the value of one if the child provided informal care to the parent during the reference period and zero otherwise) and its intensity (i.e., monthly hours of ADL or IADL assistance).

The key independent variables are a set of four binary indicators identifying adult children for whom (a) the parent and at least one sibling began coresiding between Wave 1 (1993) and Wave 3 (1998), (b) the parent and (all) coresiding sibling(s) in Wave 1 no longer coreside in Wave 3, (c) the parent and at least one sibling coresided in both waves, and (d) the parent did not coreside with any child in either wave (reference category). To control for differences across parents and children that might influence the likelihood of coresidence at the beginning of the study period, their likelihood of forming or dissolving an intergenerational household during the study period as well as the likelihood and intensity of caregiving efforts, we include a number of additional independent variables that capture differences across elderly respondents along sociodemographic, health, and economic dimensions. In particular, the elderly parent’s baseline functioning is captured by indicators of limitations in ADLs (ranging from 0 to 6) and IADLs (ranging from 0 to 5) defined as IADLs only (reference category), limitations with one to two ADLs (mild disability), and limitations with
three or more ADLs (severe disability). Sociodemographic characteristics of the unpartnered elderly parent include age (categorized as <80 years old [reference category], 80–84, 85 or older), gender, race/ethnicity (African American/black; Hispanic; and non–African American, non-Hispanic [reference group]), marital status (currently divorced relative to the reference category of currently widowed), and years of formal education (categorized as less than high school, high school [reference category], and at least some college). Finally, the elderly parent’s economic status is incorporated into the analysis by two constructs: income (based on wages, Social Security, and pension income) and wealth (measured by the respondent’s total net worth, both measured at study entry and based on the RAND-imputed variables available in the HRS-AHEAD public use files).

Characteristics of each adult child of the elderly parent include age (categorized as <50 years old, the reference category, 50–54, 55–64, and 65 or older), gender, marital status (married/partnered relative to unmarried/unpartnered), years of formal education, and number of children. We also control for characteristics of the child’s sibling network: in particular, its size, captured by number of siblings; gender composition, captured by an indicator of any sister; and marital status composition, captured by an indicator of any unmarried sibling. Table 1 contains a complete list of variable definitions and summary information for our sample.

**Empirical Estimation**

We use a difference-in-differences estimator (Meyer, 1994) to examine the extent to which changes in children’s caregiving efforts across survey waves is associated with changes in their siblings’ coresidence with the parent.

Defining $\Delta_i$ as a child for whom a sibling and the parent made a transition into (I) coresiding, $\Delta_{i0}$ as a child for whom the parent and (all) coresiding sibling(s) made a transition out (O) of coresidence, $K_{i0}$ as a child for whom the parent and at least one sibling coresided in both (B) waves, and $K_{iN}$ as a child for whom the parent did not coreside (N) with any child, we model care from each child $j$ ($j = 1 \ldots J$) in family $i$ as:

$$C_{ij} = X_{ij} \beta + Z_{ij} \delta + \phi \times t + \alpha_1 \Delta_{i0} + \alpha_2 \Delta_{i0} + \alpha_3 K_{i0}$$

$$+ \tau_1 \times t \times \Delta_{i0} + \tau_2 \times t \times \Delta_{i0} + \tau_3 \times t \times K_{i0} + \varepsilon_{ij}$$

Where depending on the model, $C_{ij}$ represents either (a) the probability that child $j$ provided care in family $i$ or (b) the number of monthly parental care hours provided by child $j$ in family $i$, $X_{ij}$ represents family (and parent) characteristics of the $i$th family, $Y_{ij}$ represents a vector of child-specific characteristics for the $j$th child in family $i$, and $Z$ represents characteristics of the other children in the $i$th family.

The variable $\phi$ captures the effect of time on caregiving for a child who never had a sibling coresiding with a parent, whereas the vector $\{\alpha\}$ measures group differences in baseline year parental care relative to the effect of baseline year parental care for a child who never had siblings who coreside with a parent. The key parameter estimates for our hypotheses are the interaction terms between wave and groups, the vector of variables $\{\tau\}$. They represent the changes over time in a child’s provision of parental care across waves for each group relative to a child whose siblings did not live with the parent in either wave of the survey—that is, relative to $K_{iN}$, our reference group. These variables measure the effect of time-varying “group” effects and provide a test of the hypothesis that time transfers to parents among children whose sibling(s) made a transition into (or out of) coresiding with the disabled parent differ from those of children whose siblings did not live with the parent in either wave. In particular, we expect $\tau_1$ to be negative, reflecting the hypothesis that a non-resident child will gain bargaining power and thereby reduce her caregiving efforts when the parent and sibling begin coresiding. We also expect $\tau_2$ to be positive, reflecting the likely increase in parental care by a non-resident child when the parent and sibling cease to coreside relative to children whose parent does not coreside with a sibling in either time period. Finally, we expect $\tau_3$ to be larger than $\tau_1$ because we anticipate that care by a non-coresident child will increase when the parent and sibling stop coresiding relative to a child whose parent is coresiding with a sibling in both time periods.

Using unweighted data, we estimate the models using a probit specification for the propensity and a Tobit specification for the intensity of child-provided care. Given the relatively small sample and cell sizes, we report $p$-values for all coefficients instead of conforming to the conventional $p < .05$ as the critical level to determine significance.

**Results**

Our sample is composed of 1,104 adult children of unpartnered, disabled elderly HRS-AHEAD respondents who were community dwelling and participated in both Waves 1 and 3 of the survey. Of those, 16.3% had a sibling who experienced a change in coresidence status with the parent between 1993 and 1998. Table 2 provides descriptive information for each of the four mutually exclusive groups of children on the probability and intensity of child-provided care and differences in these outcomes between the two waves.

The likelihood that a child provides informal care increases 6 percentage points (from 27% to 33%) for those whose parent never coresided with a sibling and decreases 2 percentage points (from 18% to 16%) for those whose parent and sibling began coresiding between survey waves, resulting in a difference-in-differences estimate of 8 percentage points. Similarly, children for whom the parent and a sibling cease coresiding between waves increase their likelihood of providing informal care by 19 percentage points (from 12% to 31%),
whereas children for whom the parent and at least one sibling coresided in both waves increase their probability of providing care by 2 percentage points (from 6% to 8%), resulting in a difference-in-differences estimate of 17 percentage points. Finally, the difference-in-differences estimate of the likelihood of providing parental care for children whose parent and a sibling began coresiding relative to children whose parents ceased coresidence with a sibling in either Wave 1 or Wave 3; 0 otherwise.

Unadjusted difference-in-differences results for intensity of caregiving efforts tell a similar story. Children whose parent and sibling began coresiding between waves reduced their caregiving by 7.3 hr (from 18.1 to 10.8 monthly hours), whereas children with parents who did not coreside with a sibling in either time period increased their caregiving by 8.6 hr (from 21.3 to 29.9 hr). In contrast, non-resident

Table 1. Variable Definitions and Summary Information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coresidence group</td>
<td>=1 if (at least one) sibling and parent began coresiding between Wave 1 (1993) and Wave 3 (1998); 0 otherwise</td>
</tr>
<tr>
<td>Sibling and parent no longer coreside</td>
<td>=1 if coresiding sibling(s) in Wave 1 no longer coresides with parent in Wave 3; 0 otherwise</td>
</tr>
<tr>
<td>Sibling and parent coreside in both waves</td>
<td>=1 if (at least one) sibling and parent coreside in both Waves 1 and 3; 0 otherwise</td>
</tr>
<tr>
<td>Parent does not coreside with any child</td>
<td>=1 if there is no coresidence in either Wave 1 or Wave 3; 0 otherwise</td>
</tr>
<tr>
<td>Adult child characteristics at study entry</td>
<td></td>
</tr>
<tr>
<td>Age: &lt;50</td>
<td>=1 if child’s age &lt;50 years old</td>
</tr>
<tr>
<td>Age: 50–54</td>
<td>=1 if child’s age 50–54 years old</td>
</tr>
<tr>
<td>Age: 55–64</td>
<td>=1 if child’s age 55–64 years old</td>
</tr>
<tr>
<td>Age: 65+</td>
<td>=1 if child’s age ≥65 years old</td>
</tr>
<tr>
<td>Female</td>
<td>=1 if female; 0 otherwise</td>
</tr>
<tr>
<td>Married/partnered</td>
<td>=1 if married or living as married; 0 otherwise</td>
</tr>
<tr>
<td>Number of children</td>
<td>Count of children of adult child</td>
</tr>
<tr>
<td>Less than high school education</td>
<td>=1 if adult child completed less than 12 years of formal education</td>
</tr>
<tr>
<td>High school graduate</td>
<td>=1 if adult child has 12 years of formal education</td>
</tr>
<tr>
<td>Some college</td>
<td>=1 if adult child has 13 or more years of formal education</td>
</tr>
<tr>
<td>Characteristics of child’s sibling network</td>
<td>Count of adult siblings of the child at study entry</td>
</tr>
<tr>
<td>Number of siblings</td>
<td>=1 if the adult child has at least one female sibling; 0 otherwise</td>
</tr>
<tr>
<td>Any unmarried sibling</td>
<td>=1 if the adult child has an unmarried/unpartnered sibling; 0 otherwise</td>
</tr>
<tr>
<td>Sociodemographic characteristics of elderly parents</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Respondent’s age in years</td>
</tr>
<tr>
<td>Female</td>
<td>=1 if female; 0 otherwise</td>
</tr>
<tr>
<td>African American/black</td>
<td>=1 if race/ethnicity is African American/black; 0 otherwise</td>
</tr>
<tr>
<td>Hispanic</td>
<td>=1 if respondent’s race/ethnicity is Hispanic; 0 otherwise</td>
</tr>
<tr>
<td>Non–African American/black, non-Hispanic</td>
<td>=1 if respondent’s race/ethnicity is non–African American/black, non-Hispanic; 0 otherwise (reference)</td>
</tr>
<tr>
<td>Divorced</td>
<td>=1 if divorced at study entry; 0 otherwise</td>
</tr>
<tr>
<td>Widowed</td>
<td>=1 if widowed at study entry; 0 otherwise</td>
</tr>
<tr>
<td>Less than high school education</td>
<td>=1 if parent completed less than 12 years of formal education</td>
</tr>
<tr>
<td>High school graduate</td>
<td>=1 if parent reports has 12 years of formal education</td>
</tr>
<tr>
<td>Some college</td>
<td>=1 if parent has 13 or more years of formal education</td>
</tr>
<tr>
<td>Parental physical functioning at study entry</td>
<td>=1 if parent reports limitations with IADLs only; 0 otherwise</td>
</tr>
<tr>
<td>IADLs only</td>
<td>=1 if parent reports limitations with instrumental activities of daily living only; 0 otherwise</td>
</tr>
<tr>
<td>1–2 ADLs</td>
<td>=1 if parent reports limitations with 1–2 basic activity of daily living; 0 otherwise</td>
</tr>
<tr>
<td>3+ ADLs</td>
<td>=1 if parent reports limitations with 3 or more basic activity of daily living; 0 otherwise</td>
</tr>
<tr>
<td>Parental economic status at study entry</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>Wages, Social Security, and pension income, in hundreds</td>
</tr>
<tr>
<td>Net worth</td>
<td>Estimated (assets − debts), including home mortgage and all other financial assets and liabilities, in thousands</td>
</tr>
</tbody>
</table>

Note. ADL = activities of daily living; IADL = instrumental activities of daily living. Summary statistics are based on the sample of 1,104 adult children of unpartnered, disabled elderly respondents with at least two adult children aged 18 years or older in Wave 1 (1993).
children whose parent and sibling(s) cease coresiding increase their hours of care by a substantial 16.8 hr (from 5.3 to 22.1 monthly hours), nearly double the caregiving efforts of non-coresident children whose parent does not coreside with a sibling in either period and four times the caregiving efforts of non-coresident children whose parent coreside with at least one sibling at both survey waves.

Although these bivariate results are generally consistent with our hypotheses that changes in parent–sibling coresidence are associated with changes in transfers by non-coresident children, they do not control for important confounders, chief among them the parent’s level of disability. The parameter estimates for the full difference-in-difference multivariate models shown in Table 3 address this problem.

The results in Table 3 are consistent with our descriptive results and are generally supportive of our hypotheses. Perhaps the most striking finding in Table 3 is the association between a parent–sibling’s transition out of coresidence (ΔK) relative to children whose parents did not coreside with a sibling in either wave and caregiving. Non-coresident children whose siblings ceased to coreside with the parent between 1993 and 1998 are significantly more likely (0.52, p = .03) to provide parental care in Wave 3 than in Wave 1 compared with non-coresident children who never had a parent coreside with a sibling. They also provided significantly more hours of care in Wave 3 relative to Wave 1, as indicated by the Tobit coefficient (90.1, p = .08). These associations persisted despite controls for parent’s health and disability and for other factors likely to influence caregiving. Although the underlying coefficients on the interactions between wave and parent–sibling’s transition into coresidence (ΔKw) were only marginally significant, their direction is of interest: Parameter estimates indicate that children whose parent and sibling began coresiding are less likely to provide care themselves (−0.34, p = .13) and provide fewer hours of care (−63.5, p = .15) after parent–sibling coresidence than they did before, relative to those whose parents and siblings did not coreside in either time period. Our results also indicate that children who had a sibling cease to coreside with the parent were more likely to provide care and provided more care than children who had a sibling live with the parent in both waves (0.52 vs. −0.10 for the propensity to provide care and 90.1 vs. −14.1 for hours of care, respectively). Finally, as expected, difference-in-difference estimates of the contribution by children whose parents did not experience a transition in living arrangement with a sibling (i.e., those whose parents’ coresided with a sibling in both waves [K0] relative to those whose parents did not coreside with any child in either wave [Kw, the reference group]) were both small in magnitude (−0.10 and −14.1 for propensity and intensity equations, respectively) and not statistically significant (p = .62 and .72, respectively). Taken together, these results are consistent with our hypothesis that non-coresident children take advantage of their increased bargaining power by reducing the care they provide and lose that bargaining advantage when they no longer have a sibling coresiding with a parent.

In addition to these main difference-in-difference findings, results in Table 3 indicate that the likelihood of providing care increases over time (t) for children whose parents never coresided with a sibling while the negative coefficients on the group variables suggest that the propensity to provide care and the intensity of care provision are lower in the baseline year for all groups relative to the children whose parents did not coreside with any child during the 5-year study period (K, the reference category).

Other factors are associated with child-to-parent transfers in predictable ways. Disability levels, for example, are strongly associated with both the likelihood and the intensity of care provided by children. In addition, although there were no statistically significant differences in the propensity to provide care, children of Hispanic and African American/black parents provided more hours of care to their disabled parents than did their non–African American/ black and non-Hispanic counterparts. The parent’s economic status, as measured by current income, decreased the probability that children provided care although parental wealth, as measured by net worth, was not associated with either the propensity or intensity of care provision. Sons (and their spouses, if married) were less likely than daughters (and their spouses, if married) to provide care to

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**Table 2. Provision of Parental Care by Sibling(s)’ Coresidence Status Group and Wave**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sibling and parent begin coresiding</td>
<td>103</td>
<td>0.18</td>
<td>0.16</td>
<td>−0.02</td>
<td>4.1</td>
<td>2.0</td>
<td>−2.1</td>
</tr>
<tr>
<td>Sibling and parent coreside in both waves</td>
<td>239</td>
<td>0.06</td>
<td>0.08</td>
<td>0.02</td>
<td>0.4</td>
<td>3.4</td>
<td>4.8</td>
</tr>
<tr>
<td>Sibling(s) and parent no longer coreside</td>
<td>77</td>
<td>0.12</td>
<td>0.31</td>
<td>0.19</td>
<td>6.2</td>
<td>5.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Parent does not coreside with any child in either wave</td>
<td>685</td>
<td>0.27</td>
<td>0.33</td>
<td>0.06</td>
<td>18.4</td>
<td>21.3</td>
<td>29.9</td>
</tr>
</tbody>
</table>

---
a disabled elderly parent. Being married and having more minor children was negatively associated with providing parental care; these competing demands on the time of the child were also negatively associated with the number of hours of care provided in a month. Consistent with the gendered nature of parental care, having a sister in the sibling network decreased the likelihood that a child provided care; the presence of a sister also decreased the intensity of care provided by the child to her disabled elderly parent. Finally, children with a larger sibling network were less likely to provide parental care.

**Discussion**

The aging of the American population suggests that the demand for long-term care for older persons will increase in the near future. The impending increase in the number of and proportion of older adults has renewed interest in

<table>
<thead>
<tr>
<th>Table 3. Difference-in-Difference Multivariate Regression Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal care propensity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Time and group indicator variables</strong></td>
</tr>
<tr>
<td>( \Delta_{\text{I}} \times \text{tw} )</td>
</tr>
<tr>
<td>( \Delta_{\text{O}} \times \text{tw} )</td>
</tr>
<tr>
<td>( \Delta_{\text{B}} \times \text{tw} )</td>
</tr>
<tr>
<td>( \tau: \text{survey wave} )</td>
</tr>
<tr>
<td>( \Delta_{\text{I}}: \text{sibling and parent begin coresiding} )</td>
</tr>
<tr>
<td>( \Delta_{\text{O}}: \text{sibling and parent no longer coreside} )</td>
</tr>
<tr>
<td>( \Delta_{\text{B}}: \text{sibling and parent coreside in both waves} )</td>
</tr>
</tbody>
</table>

**Parent’s characteristics**

<table>
<thead>
<tr>
<th>Age</th>
<th>Coefficient</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>80–84</td>
<td>0.13</td>
<td>.18</td>
</tr>
<tr>
<td>85+</td>
<td>0.20**</td>
<td>.02</td>
</tr>
<tr>
<td>Gender: male</td>
<td>-0.12</td>
<td>.21</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American/black</td>
<td>0.11</td>
<td>.22</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.06</td>
<td>.56</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>0.19*</td>
<td>.06</td>
</tr>
<tr>
<td>Some college</td>
<td>-0.16</td>
<td>.27</td>
</tr>
<tr>
<td>Marital status: divorced</td>
<td>-0.19**</td>
<td>.15</td>
</tr>
<tr>
<td>Disability level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–2 ADLs</td>
<td>0.13†</td>
<td>.11</td>
</tr>
<tr>
<td>3+ ADLs</td>
<td>0.20**</td>
<td>.02</td>
</tr>
<tr>
<td>Economic status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>-8.46E-5***</td>
<td>.00</td>
</tr>
<tr>
<td>Net worth</td>
<td>-1.2E-7</td>
<td>.88</td>
</tr>
</tbody>
</table>

**Adult child’s characteristics**

<table>
<thead>
<tr>
<th>Age</th>
<th>Coefficient</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>50–54</td>
<td>-0.31***</td>
<td>.00</td>
</tr>
<tr>
<td>55–64</td>
<td>-0.34***</td>
<td>.00</td>
</tr>
<tr>
<td>65+</td>
<td>-0.38***</td>
<td>.00</td>
</tr>
<tr>
<td>Gender: male</td>
<td>-0.66***</td>
<td>.00</td>
</tr>
<tr>
<td>Marital status: married/partnered</td>
<td>-0.14**</td>
<td>.04</td>
</tr>
<tr>
<td>Number of children</td>
<td>-0.05**</td>
<td>.04</td>
</tr>
</tbody>
</table>

**Education**

| Less than high school                                        | -0.15*      | .08     |
| Some college                                                 | 0.05        | .55     |

**Sibling network characteristics**

| Number of siblings                                           | -0.05***    | .00     |
| Any sisters                                                  | -0.12**     | .05     |
| Any unmarried sibling                                        | 0.05        | .59     |
| Constant                                                     | 0.23*       | .14     |

| Log likelihood                                               | -1.003      |         |
| \( \chi^2 \)                                                 | 364***      |         |

Note. ADL = activities of daily living; IADL = instrumental activities of daily living. Omitted category for disability is parents with only IADLs, for education is completed high school, for elderly parent’s age is less than 80 years old, for adult children’s age is less than 50 years old, and for family race/ethnicity is non–African American/black, non-Hispanic (primarily Caucasian). Results are statistically significant at ***p < .01; **p < .05; *p < .10; †p < .15.
intergenerational relations and the role of families in providing care for their elderly members. Interest in intergenerational family behavior has also been heightened by concerns about the effect of other demographic trends, including changing fertility patterns and family structure. A better understanding of the process by which families come to assume the responsibility and share the burden of caring for the disabled elderly members is essential for designing and evaluating long-term care policies.

In this article, we have used a game theoretic framework of families’ living and care arrangements to motivate an empirical model of the association between changes in parent–child coresidence and caregiving efforts by non-resident adult children of unpartnered disabled elderly parents. In general, our results support the notion that changes in coresidence alter the bargaining power of coresiding children relative to their non-coresiding siblings. Specifically, we observe significant reductions in the likelihood of providing informal care and in the intensity of care provided by children with siblings who begin to coreside with their parent relative to children with no sibling who lived with a parent at either point in time. Similarly, children increase their likelihood and intensity of care provision when their siblings and the parent no longer coreside. These findings highlight the importance of understanding the dynamics of family interactions when evaluating long-term care policies.

Our study contributes to the small but growing literature examining long-term care decisions from a family perspective that explicitly accounts for interactions among siblings. In addition to using a game theoretic model to focus on siblings, our analysis differs from related work by examining the association of caregiving efforts of adult children in the presence or absence of a change in coresidence between her parent and siblings. By doing so, we provide evidence supporting a plausible alternative explanation for differential adult children caregiving efforts based on relative bargaining power, the source of which is a sibling’s coresidence status with the disabled parent. Although our results are consistent with a model of bargaining power that arises from strategic behavior, they do not imply that conflict is the predominant mode of interaction among siblings, nor does it preclude some degree of solidarity among siblings. In addition, although one might interpret our results as consistent with differential filial responsibility among siblings, as proposed by Silverstein et al. (2008), it is not clear why those sentiments of obligation would have changed as a consequence of a change in parental coresidence.

Given the complexities of intergenerational living and care arrangements, no single model can fully capture all dimensions of long-term care decision making within families. In addition, although game theoretic models account for interactions among a small number of actors, such models require important assumptions regarding family members’ preferences in order to generate testable implications. The model considered here is based upon the assumption that all interactions among siblings are fully captured by the shared concern for the parent’s well-being, a family-specific public good that enters all children’s utility functions. An alternative, more complex specification would allow children to have preferences over their siblings’ utilities as well. In particular, siblings may act altruistically toward each other as well as toward their parents. According to such a fully altruistic specification, a child’s actions are guided by her preferences for her own consumption, her concern for the parent, and by concern for her siblings’ utility, the economic counterpart of the sociological notion of sibling solidarity or mutual caring. Such an approach, however, is intractable in a model like ours. Furthermore, data limitations prevented us from investigating the relationship between parent–child geographic proximity and bargaining power. A richer theoretical model that incorporates strategic, longitudinal decision making regarding the relative distances between each sibling and her parent and how these decisions ultimately affect the probability and intensity of caregiving efforts for every child in the family remains an important direction for future work.

A number of additional limitations merit comment. Our analysis describes the experience of adult children of unpartnered, community-dwelling, disabled parents who survived the 5-year study period. Although less than 3% of our eligible sample of parents was excluded due to survey or item non-response and about 5% were excluded due to permanent nursing home entry, attrition due to death was substantial (19%) among this frail elderly population. In addition, although the parent is an active player in the first (living arrangement/coresidence) stage of the game and may indirectly affect the outcome of the second (transfers) stage through the allocation rule reflecting her bargaining with the coresident child, we do not allow the parent to strategically alter the second-stage equilibrium (e.g., by refusing care from the coresiding child). Another complication that we faced when examining the relationship between changes in coresidence status of the parent and siblings’ informal caregiving efforts was the possibility that the characteristics of the coresident child might be endogenously determined along with siblings’ contributions of informal care due to non-random household formation. To the extent that such assortative matching occurs, our findings regarding the relationship between parent–child coresidence and siblings’ transfers could be biased, as they might confound transfer effects with household membership selection effects. To account for this possibility, we incorporated controls for the attributes of all siblings in the child’s family network in our models. This approach minimizes the effects of such potential sources of bias, particularly given our focus on changes in informal caregiving in response to changes in coresidence status with the parent. Finally, we are agnostic about the production of parental well-being and ignore the possibility of task-specific contributions by child’s gender (Litwak & Kulis, 1987) or potential interactions among
same-gender siblings and differential productivity of children in providing care. Such extensions remain directions for future research.

Regardless of the theoretical underpinnings of our findings, our empirical findings highlight the sensitivity of care provision in families to changes in coresidence. As the United States explores creative policies to address the needs of its growing elderly population while maintaining them in the community, understanding the implications of shared living arrangements—where family caregiving for the unpartnered elderly parent is likely to be shared unequally among siblings—is an important aspect of the evaluation of such programs.

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References


