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## **ABSTRACT**

This paper considers how siblings coordinate help they provide parents, both at a point in time and over the longer run. Because few studies include information from siblings about their relationships with their parents and each other, it has been difficult to determine whether children coordinate care for their parents. We look within families and explore whether and how siblings share caregiving responsibilities, asking: What characteristics of siblings and their families predict whether siblings take turns helping parents? What factors affect the coordination of care as parents age? We use data on 1,523 families with more than one child and with a living parent from the Wisconsin Longitudinal Survey, a panel study of 1957 high school graduates and siblings and look at practical and socio-emotional help provided to parents. Findings show that nearly forty percent of parents receive help from more than one child in the form of practical or socio-emotional support. Our findings also suggest that daughters coordinate care that they and their siblings provide parents.

Due to increased life spans and decreased fertility, the percent of people aged 65 and older in the United States is expected to increase from about 13 percent in 2010 to about 20 percent by the year 2030 (Statistical Abstract of the United States, 2010). With the aging of the United States population comes a growing interest in who provides for older parents and why. There is substantial variation among the oldest old in their need for assistance. Among those 70 years old or older who need some help with personal care or routine aspects of daily life, the vast majority receive help from family members. After spouses, children and, especially, daughters, are the most common caregivers. Twenty percent of caregivers in a frail population are non-coresident children, and 70 percent of those children are female (McGarry, 1998). Thus, children are an important source of care to older parents.

Most knowledge on how children provide for their parents comes from studies of between-family differences, although researchers have begun to pay more attention to within-family variation (Henretta et al., 1997; Lin, 2006; McGarry, 1998; Pillemer and Suitor, 2008). Variation in siblings' characteristics, and their relationships with each other and their parents affect how care is distributed within the family.

This paper considers when care for older parents is shared among their children as opposed to being provided by only one child or not at all. We frame this study as an investigation of gender differences in light of women's roles as "kin keepers" within the family (Hagestad, 1986). We also consider children's ability to provide care and competing demands for their caregiving attention as factors that help or hinder their ability to share care with other siblings. In the discussion that follows, we examine some of the ways care might be coordinated within the family and the factors that predict which children provide care for older parents. We investigate routine help that facilitates older parents' ability to live independently.

## BACKGROUND

### Helping Parents as a Family Process

**How Families Organize Care.** Support for older parents is often shared among siblings. In fact, the more children an elderly person has, the less likely that a particular child will provide help (Ward, Spitze, & Deane, 2009). There are many ways siblings might share caregiving responsibilities. Siblings might each contribute to their parents' care at any given time, or they may take turns providing care, for instance from one year to the next. Game theoretic approaches suggest that this is unlikely for co-residential care (Pezzin et al., 2008), but it may be more likely for non-coresidential care because a parent's move between households is costly. Siblings may also share responsibilities by dividing up tasks equally or, more likely, by specializing in different types of care for which siblings may be differentially suited. Siblings with more education and higher wages, for instance, may provide parents with money while siblings with lower wages may provide more time help, due to different "costs" of their time (Coward and Dwyer 1990; Henretta et al., 1997; Laditka and Laditka 2001; Zissimopoulos, 2001). Another form of specialization occurs if siblings divide tasks along gender lines. In general, women provide more emotional assistance to parents and other family and friends than do men (Chelsey and Poppie, 2009; Kahn, McGill, Bianchi, in progress). There is less evidence about whether men are more likely to be involved in more practical, "hands on" tasks. However, one study using the Wisconsin Longitudinal Study data and the same help variable employed in our paper does find that middle-aged men provide more help than women with housework, yard work, and repairs, particularly for friends, neighbors, and for adult children (Kahn, McGill,

Bianchi, forthcoming). This suggests that within families, sisters may provide more socio-emotional help to parents, with brothers providing more practical help.

**Daughters as Helpers.** Much of the empirical literature shows that gender contributes to caregiving differences among children. In the United States, daughters are much more likely than sons to provide care to parents who are not living with them (McGarry, 1998; Henretta et al. 1997; Hogan et al. 1993). Gender role socialization may be one reason for the stark differences between daughters and sons in caregiving. Parents treat sons and daughters differently, even when they are very young (Raley and Bianchi, 2006). Different interaction styles, allocation of resources and expectations about the different roles men and women play in adulthood may all contribute to the differential socialization of men and women.

**Daughters as Coordinators of Help.** The gender composition of adult children in a family is also associated with whether children help to older parents. Although brothers, in general, are less likely to help with care work, a sister may prompt brothers to help. Sisters promote more active sibling ties in general (Cicirelli 1994), and may promote more active helping behaviors within the family, as well. In a qualitative study of siblings caring for older parents, Matthews (2002) finds evidence that brothers with at least one sister provide more help than brothers with no sisters (p. 145). This suggests that sisters coordinate care within the family. Brothers who have sisters also appear to be persuaded (and sometimes even pressured) to comply with the higher standard of care sisters have for parents. Sisters with brothers routinely report more caregiver stress than those with no brothers possibly in response to their responsibilities as the

manager of the care within the family and because they are dealing not only with parents, but also with brothers who may not support their approach to care (Matthews, 2002, p. 145-146).

Sisters might not necessarily take an active role in persuading brothers to help, but may simply serve as role models for brothers. Brothers may be influenced to help parents by observing their sisters and adopting like behaviors, or parents may ask sons to do what daughters are already doing. In addition, socialization within the family might differ based on the sex composition of a parents' offspring (e.g., Harris and Morgan, 1991), and that would explain why parents who have at least one daughter are more likely to receive help from their children than parents without a daughter (Spitze and Logan, 1990; Wolf et al. 1997). An exception to this empirical pattern comes from McGarry's (1998) research on a different type of help. She finds that brothers do not help if sisters are available to provide care (McGarry, 1998). Taken together, these findings that the division of labor among siblings depends on the extent to which parents need help and the type of help they need.

**Sibling Relationships and Help.** Relationships among siblings may also contribute to the extent of shared care within a family. Here too, there is likely a strong gender component. Sisters may be better suited to share care for parents than are other sibling pairs. Sisters are closer to each other and communicate better with each other than do brothers or brother-sister pairs (Spitze and Trent, 2006). Women also report greater closeness to all of their siblings than do men (Connidis 2001; White 1994; Wilson et al. 1994) and sisters telephone other siblings more than brothers do (Eriksen and Gerstel, 2002). In addition, families with brothers and sisters are less emotionally close to each other than are families with only sisters (Connidis and Campbell, 1995). In a similar vein, findings suggest that sisters coordinate care better than brothers do because sisters

are more likely to discuss their parents' needs for care and decide together about help to provide (Matthews, 2002, p. 125). Brothers, on the other hand, mostly help when asked. They are therefore less likely to coordinate care with each other in advance (Matthews, 2002, p. 124).

**Sibling Variation in Ability to Provide Help.** Differences among children in their economic resources and needs and their other family responsibilities may affect who provides help to their parents. Children who themselves need assistance because of poor health, limited financial resources, or who are married and caring for young children are less able to provide for their parents, all else equal, than children who have fewer constraints (Hogan et al., 1993). Children with a greater ability to help are also more likely to actually provide help (Wolf and Soldo, 1988; Hogan et al., 1993). Children with more education, for instance, have more resources and more flexible jobs – both of which should make them more likely, or at least better able, to provide help to their parents. Some studies have found, in fact, that adult children with a college degree are more likely to help parents (McGarry and Schoeni, 1995). However, within the family, the story is more complex, with adult children with more education and higher wages providing less time to needy parents than do their siblings perhaps because highly educated siblings' greater apparent costs of giving time help, as noted above (Coward and Dwyer 1990; Henretta et al., 1997; Laditka and Laditka 2001).

Another motivation for children to help their older parents is to reciprocate for gifts or transfers of other types from parents to children earlier in life. Parents may invest in children's schooling or give them a gift or loan to help them set up their own households and to insure their children's future economic well-being. Differences among siblings in parents' transfers earlier

in life explain later variation within the family in who provides help (Henretta et al., 1997), with children likely to reciprocate for earlier transfers by helping parents later in life.

The quality of children's relationship with their parents also varies within the family (Davey et al, 2009; Lin, 2006; Pillemer and Suitor, 2008). Children who are emotionally closer to a parent are more likely to provide help. Even perceptions of parents' needs may vary within the family. Children sometimes have different perceptions of the same "objective" circumstances, such as parents' health (Cicerelli, 2000). These differences may be substantively meaningful, as when parents prefer not to disclose illness to children they feel less close to or comfortable treating as a confidante. Differences in reports from parents and children may also arise because siblings interpret the same event differently, for instance if children think the same symptoms of physical disability require different levels of care. Importantly, gender may play a role here as well: brothers and sisters may differ in their interpretations of the extent and type of help parents' desire or need (Matthews 2002, p. 143).

In sum, theory suggests that the relative characteristics of siblings, including their resources, competing demands on their time, and, especially, gender, should predict whether siblings share caregiving responsibilities for their older parents. In this paper we use data on 1,523 sibling pairs in the Wisconsin Longitudinal Study to determine the extent to which help for parents is coordinated between sibling dyads. We focus on the gender composition of siblings' and their needs and resources as possible determinants of why some siblings help older parents while others do not.

### **What Constitutes Help?**

Help comes in many varieties. It can be in the form of emotional support and advice, help with practical everyday things, money, or help with dressing, bathing, and other activities.

Across families, parents' needs for help differ, with some needing help with routine chores, others with more personal care, and still others needing financial assistance or several forms of help. Some studies, such as those that use data from the Health and Retirement Study (HRS) or AHEAD data focus on help provided to parents who report needing care with activities of daily living (ADL), such as help dressing, bathing, and preparing meals. This captures help provided to particularly needy and frail parents – only about 8.5 percent of the respondents in the older AHEAD sample (McGarry, 1998) and a smaller percent of respondents in younger cohorts. Other studies focus on financial transfers from children to parents; however, these transfers are quite rare as well. In fact, three times as many parents over age 60 gave money to a “financially independent” child as received money from a child, according to a recent survey by the Pew Research Center (Taylor et al., 2005).

In this paper, we focus on broader measures of care, such as help with everyday chores including housework, yard work, transportation, and errands. We measure help parents need to maintain their independence and ties to the family. We are interested in help broadly defined: the small, every day things children do to help make older parents lives a little easier. In many ways, our measure of help, which will be described in more detail in the Data and Methods section of this paper, can be thought of as the easy tasks that should not provide an undue burden on children but can provide parents with practical help they might need, and also with the social and emotional support that keeps them connected to the family. Help with ADL/IADL activities is a different type of help, and one that is most likely provided only by the most devoted children.

Help is multidimensional. Siblings may divide responsibility for different types of help. In the analyses to come, we therefore pay particular regard to how the gender composition of the

dyad affects the types of help provided to parents and who gives this help. We examine overall levels help and also distinguish between practical (housework, transportation, etc.) and socio-emotional help (i.e. advice, encouragement, and support). Finally, we also consider whether and why some sibling dyads are more likely to provide both practical and socio-emotional help than are others.

### **Contributions of this Paper**

In this paper we examine help provided to older parents from the children's perspectives. We use reports of help provided to older parents from two children in a family to examine how siblings coordinate help for older parents. We begin by examining help provided at one point in time and then look at help provided over the longer run as parents age. We ask three primary questions: (1) What characteristics of siblings predict whether both siblings help older parents at one point in time? (2) Are there gender differences in the type of help provided? (3) What factors affect the coordination of care between siblings over time, as parents age?

We move beyond past work which, for the most part, relies on parents' reports about their family instead of seeking information directly from children. Because few studies include direct reports from siblings about their relationships with each other and with their parents it has been difficult to determine whether children coordinate help they provide to their parents. In fact, few large scale U.S. datasets include information about mothers' characteristics as well as the characteristics of their children. The Wisconsin Longitudinal Study is unique in its breadth of coverage of both socioeconomic characteristics and family relationships. It also provides information on a broader array of care, including help with everyday practical tasks and socio-emotional help.

## DATA AND METHODS

### Data

We use data from the Wisconsin Longitudinal Survey<sup>1</sup> (WLS). The WLS is a 50-year longitudinal study of a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957. Survey data were collected from the graduates or their parents in 1957, 1964, 1975, 1992-93, and 2003-5. In 1994 and 2006 a randomly selected sibling of the graduate was also interviewed.<sup>2</sup> The two most recent waves were conducted as telephone and mail surveys. The WLS has very high response rates. For the original sample of graduates, 87 percent are represented by parent reports in 1964, 90 percent provided self-reports in 1975, 87 percent in 1992-93, and about 86 percent responded by telephone and/or mail in 2003-05 (7730 participants).<sup>3</sup> Response rates for the randomly selected sibling are somewhat lower than for graduates, but still quite high (Table 1, *WLS*

*Handbook* [http://www.ssc.wisc.edu/wlsresearch/documentation/handbook/WLS\\_Handbook.pdf](http://www.ssc.wisc.edu/wlsresearch/documentation/handbook/WLS_Handbook.pdf).

In 1957 roughly three quarters of the Wisconsin population graduated from high school. The sample represents the white, non-Hispanic population born around 1939 who obtained at least a high school education. About two thirds of the United States population 60-64 years old were non-Hispanic whites with at least 12 years of schooling in 2000 (United States Bureau of the Census 2000: Table 1a). The WLS includes more diversity on education than is commonly

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<sup>1</sup> The Wisconsin Longitudinal Study (WLS) has been supported principally by the National Institute on Aging (AG-9775 and AG-21079), with additional support from the Vilas Estate Trust, the National Science Foundation, the Spencer Foundation, and the Graduate School of the University of Wisconsin-Madison. A public use data file is available from the Wisconsin Longitudinal Study, University of Wisconsin-Madison, 1180 Observatory Drive, Madison, Wisconsin 53706 and at <http://www.ssc.wisc.edu/~wls/data/>.

<sup>2</sup> In 1977 a stratified subsample of graduates' siblings was interviewed. We draw most of our data on siblings from 1994 and 2006 because the sample coverage is more complete.

<sup>3</sup> Response rates exclude sample members who have died.

assumed: About 7 percent of the original sample respondents' randomly selected sibling did not complete high school (WLS Handbook). Nevertheless the absence of minorities and immigrants from the design limits the generalizability of our findings.

The WLS data are well suited for this analysis because of the detailed background information about individuals, their parents and siblings, the high retention rates across waves of the study, and the range of economic, social and psychological characteristics included in the study. Extensive analyses of response patterns in the WLS indicate that the sample is still generally representative of the original 1957 sample in terms of gender composition, living arrangement in high school, sibship size, and parents' socioeconomic status. To the extent that there are some differences in participation rates over time, for instance by cognitive ability, the availability of information about individual and family characteristics at early waves provides insight into potential biases that arise over the 50-year coverage of the cohort (Hauser, 2005).

For ease of presentation, we refer to the original respondents as *graduates* and to the randomly selected siblings as the *siblings*. We also adopt the shortcut of referring to the 1992-94 Wave as 1993 and the 2003-06 Wave as 2004. We restrict our analyses to graduates with at least one biological sibling. The analyses are limited to graduates and biological (and adopted) siblings.

### **Analytical Samples**

We use two analysis samples. The first is for our investigations of whether graduates and siblings both provided help to their older parents in 1993. We restrict this sample to families in which neither the mother nor the father lives with any of their children. The analyses take into account whether both parents are still alive. This analysis also requires information from both

graduates and siblings about the help each provides to their parents and about the graduate's and siblings' characteristics. We begin with a sample of 8,754 graduates of Wisconsin high schools in 1957 who are respondents to the 1993 phone survey. Of these, we exclude 1,879 respondents who did not complete the 1993 mail survey. We then exclude 2,513 families where graduates report that there is no living parent in 1993. As we are interested in reports of help from graduates and their sibling, we also exclude 288 families where the graduate is an only child or does not report information about a sibling, 153 cases where the random sibling died before the interview period, 522 cases where the sibling interview was not fielded, 1,513 cases where the sibling does not respond to either the phone or mail survey, and 59 cases where the graduate and the sibling are not biologically related. To be sure that the graduate and the sibling are reporting about the same parents and to exclude cases where parents die between graduate and siblings' reporting period, we exclude 82 cases where there are inconsistent graduate and siblings' reports as to whether the mother or the father are alive. We also remove 84 families where the parent(s) is coresiding with any child. Finally, we exclude families with missing data on key model variables. This results in a final analytic sample of 1,523 families for whom we have complete information on helping behaviors for sibling pairs.

We use the second sample to explore continuity between 1993 and 2004 in who provides for their older parents. In this analysis we use data on respondents from the first analysis for families in which both the graduate and the sibling respondents are still participating in the study and where there remains at least one living parent who is not living with any child. We begin with the sample of 1,523 families in the first analytical sample. We exclude 248 graduate and 233 sibling nonrespondents to the 2004 wave. In addition, the sample size for this analysis drops considerable because of the high mortality of parents during the interval between the two waves

(surviving parents were between 81 and 102 years old in 2004). We exclude 611 families with no living parent and 25 families where a parent coresides with any child. Finally, we exclude families with missing information on any of our model variables, for a final sample size of 341 families. The smaller sample size in 2004 limits the number of independent variables we can take into account. We discuss the variables included in this model in more detail, in the sections to follow.

## Measures

**Helping Behaviors in the WLS.** Measures of the help children provided to their parents in 1993 and 2004 were based on responses to a series of questions in the mail questionnaires in which respondents were asked: *Now we are interested in the help and support that you receive from or give to people (other than a spouse or young children).* [emphasis in original] *We are interested here in help that is not paid for.* The question first asked respondents if they had given any of these types of help in the past month: help with transportation, errands, or shopping; housework, yard work, repairs, or other work around the house; advice, encouragement, moral or emotional support; help with babysitting or child care. Respondents answered about help to *parents* and help to brothers or sisters as well as to adult children, friends, and several other relationships (Liebler and Sanderfur, 2002).<sup>4</sup>

As discussed above, the advantage of this question is its broad coverage of types of help. Disadvantages are that the question uses general referents instead of asking separately about help provided to the mother and help provided to the father. Some married respondents might also

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<sup>4</sup> The WLS data include information on financial transfers between children and parents as well. However, few respondents provided financial transfers to parents. In fact, only 1.4 percent of graduates and 1.8 percent of siblings provided transfers of more than \$1000 to parents in the year preceding the 1993 survey. In addition, the 2005 wave of data does not include information about the timing of financial transfers. We therefore, do not include financial transfers as part of our multivariate analyses.

have reported about help provided to their parents-in-law. In addition, we lack information on the extent to which parents needed help or on the types of help provided to the parents by family members other than the graduate and randomly selected sibling. A final limitation is that the graduate and sibling respondents were not surveyed at the exact same time and may have a lag of two years. Therefore help may not be simultaneous for some siblings. Nonetheless, the availability of information about help to both parents with reports from two of the children in the family is an improvement on most other data sets.

### **Dependent Variables: Who Helps?**

**Cross-Sectional Analyses, 1993.** In the 1993 analysis, we examine whether graduates and their siblings provide each type of help to parents – transportation and errands; housework, yard work, and home repairs; advice and emotional support. To examine whether siblings combine efforts to provide for their parents, we create a three-category variable indicating whether: (1) only one sibling of the dyad provided help; (2) both siblings provided help; or (3) neither the graduate nor the sibling provided help. In our multivariate models, we combine these types of help in different ways to explore what predicts help overall and whether the predictors of help vary for practical help (i.e. help with transportation, errands, or shopping; housework, yard work, repairs, or other work around the house) as compared to socio-emotional help (i.e. advice, encouragement, moral or emotional support). We also consider whether one or both siblings provide parents with *both* practical and socio-emotional help.

**Over the Longer Run, 1993-2004.** We use a similar concept to operationalize a variable for help provided over time. We construct this variable using data on help from both the 1993 and

2004 mail surveys. In this analysis, our dependent variable measures the coordination of help over this 10-12 year period. We once again consider whether (1) only one sibling in the dyad helps; (2) both help; or (3) neither helps. We code this variable "1" if only one sibling of the dyad provides help in both years. That indicates the sibling is the primary helper. Both siblings are designated helpers (coded "2") if both the graduate and the sibling provide help in *either* year or if they take turns across the years. Finally, neither is considered the primary helper (coded "3") if neither child provides help in both years *or* if neither sibling provides help in one year and only one sibling helps in the other year. Ideally, we would like to disaggregate this variable even further to examine just how care is coordinated across time. However, the limited sample size in this analysis prevents us from so doing.

### **Other Model Variables**

**Needs and Resources.** We investigate help provided to parents as a function of parents' needs and resources. To that end, we include information of parent's age, health, education, and whether they live independently. We use the graduate's report about parents' characteristics.

Age is a continuous variable measured in years. If both parents are alive, age is coded as age of the older parent. Parents' health is a dummy variable coded based on the graduate's subjective evaluation of parental health and ranging from very poor to excellent health. We construct health as a dummy variable coded "1" if the parent is in poor or very poor health and "0" otherwise. If both parents are alive, "1" indicates that at least one parent is in poor health. Parents' education is a dummy variable to capture parents' resources, and is coded as "1" if either parent has a college degree, "0" otherwise. Finally, although we limit the analyses to parents who do not live with any child, we also include a dummy variable indicating whether both

parents lived independently (coded "1") or whether they live in an institutional setting or with a relative (other than a spouse or a child) or friend (coded "0").

**Relative Characteristics of Graduate and Sibling.** We also include information from the graduate and the sibling about the relative marital status of the two siblings, education of the dyad, and the gender composition of the dyad. Marital status has three categories, with "0" indicating that neither the graduate nor the sibling is married, "1" indicating that only one member of the dyad is married, and "2" indicating that both the graduate and the sibling are married. We similarly calculate the education of the dyad, with "0" indicating that neither the graduate nor the sibling has a college degree, "1" indicating that only one member of the dyad has a college degree, and "2" indicating that both the graduate and the sibling have college degrees. The gender composition of the dyad is calculated with reference to whether there is a sister in the dyad. That is, "0" suggests that it is a brother only dyad, "1" indicates a dyad with one brother and one sister and "2" suggests that both member of the dyad are sisters.<sup>5</sup>

**Control Variables.** We also control for characteristics of the family and of the sibling dyad. We use reports from the graduate to assess the total number of siblings in the family. This variable is included as a control in our analyses. We use reports from both the graduate and sibling to determine whether parents are alive. Although one parent must be alive for families to be included in this analysis, we include a control in our models for whether both parents are alive. This dummy variable is coded "1" if both parents are alive, or "0" if only one parent is alive.

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<sup>5</sup> In an earlier version of this paper, we also included variables to indicate whether or not parents contributed financially to the graduate's (sibling's) schooling, house down payment, or money to start a business, however, we had too few respondents receiving this form of support and even fewer cases where both the graduate and the sibling received this support to support the multivariate analyses.

**Additional Controls for Random Sibling's Characteristics.** Because the WLS is a sample of high school graduates in a particular year, the education and age of the graduates are more restricted than for the randomly selected siblings. We therefore include a dummy variable controlling for whether the random sibling has less than a high school degree. The graduates also all completed high school in 1957, but their siblings have a much wider age range. We therefore also control for the randomly selected sibling's age in 1993, grouping the siblings into three age groups: 30-49, 50-59, and 60+. We use age groups rather than continuous age to account for siblings who are younger, older, and of around the same age as the graduate.

**Independent Variables to Predict Change in Help Over Time, 1993-2004.** For the 2004 analysis of help over time, we once again consider the gender of the dyad as an important explanatory factor, but also take into account changes in parents' characteristics that may motivate children to help more. We consider *changes* in parents' health (change from not poor or very poor in 1993 to poor or very poor health in 2004) and in whether both parents are still alive (changes from both alive in 1993 to only one in 2004). Other control variables are similar to those above, and include the number of siblings (in 2004), whether the parent(s) live on their own (in 2004), and the age group of the siblings (in 1993).

## **Method**

Given that the dependent variable in these analyses has three categories (i.e. one child provides help, both do, neither does), we employ multinomial logistic regression methods to estimate the models. We estimated the models for three contrasts: the log-likelihood of (1) one child helping vs. neither child helping; (2) one child helping vs. both; and (3) both children

helping vs. neither. In many ways, the contrasts of primary interest involve whether there is an increased likelihood of *both* children helping compared to only one or neither child helping. We do, however, include information on all three possible contrasts. For ease of interpretation, in all tables we provide the exponentiated coefficients or the relative risks, which can be interpreted as the (relative) odds of providing help to parents.

### **Choosing the Best Model**

We investigate “who helps” within the graduate-sibling dyad. There are four distinct research questions that can be investigated when analyzing helping behavior in a family with information on two siblings. The simplest question that can be asked would be: (1) Does anyone help? In many ways, this is the approach most common in the literature. It would allow us to determine whether a parent receives help and the characteristics that predict this help. However, this approach may miss out on the factors that explain whether *both* children of the dyad provide help. Over and above the effects of the graduate, the sibling, or neither helping, there may be an *interaction* effect of *both* the graduate and the sibling providing help to parents. In that case, the question would be: (2) Is it only one child who helps, do both children help, or does neither help? But, what if there are differences between the two siblings who provide information in the data. In that case, it would be useful to distinguish between the first child’s (the graduate, in this case) and the second child’s (random sibling) helping behavior. This approach would account for potential *heterogeneity* within the family of the *graduate and sibling* and would ask: (3) Does the graduate help, the sibling help, or does neither/both help? Finally, the full model includes information on both interactions between siblings and heterogeneity of siblings and would ask: (4) Does the graduate help, the sibling help, both help, or neither help?

Table 1 shows the four possible models we considered, which include different constraints on the helping behaviors of graduates and their siblings, and the results of likelihood ratio tests comparing the models. Model 1 constrains the graduate and the sibling to have equal coefficients and also assume that there is no added effect of both of them helping. This model would be a logistic regression model, simply predicting (1) whether anyone in the dyad helps as compared (2) no one helps. Model 2 allows the coefficients to vary for the graduate and the siblings (heterogeneity) and also includes an interaction for both. This model makes the least theoretical sense for this paper, but is included in the comparisons as well for completeness. This model has a dependent variable that measures whether: (1) graduate only helps (2) sibling only helps (3) both/neither help. Model 3 is the one we ultimately use in our analyses to come. This model includes an interaction effect of both children helping parents with any type of help (i.e. practical and socio-emotional help), but does not distinguish between help provided by the graduate and sibling. This model has three categories for the dependent variable: (1) whether neither the graduate nor the sibling helps (2) whether only one child of the graduate -sibling dyad helps, and (3) whether both the graduate and the sibling help. The most detailed model, Model 4, allows coefficients to vary for the graduate and the sibling and adds in a parameter to capture the interaction of both children helping. The full model and includes four categories for the dependent variable: (1) whether the graduate only helps (2) whether the sibling only helps (3) whether both help (4) whether neither helps.

TABLE 1 HERE

We estimated each model with the full array of variables for family and random sibling characteristics and compared models through likelihood ratio tests. The likelihood ratio tests suggest that the full model, Model 3, differs significantly in its predictions from all the simpler, constrained models. However, upon careful examination of the model results, we find that the effects of the key variables of interest do not differ between the full model, Model 3, and a version that slightly simplifies this model by ignoring potential heterogeneity of graduates and their sibling. In addition, we find that controlling for the characteristics of the random sibling reduces the difference between the two models (although the likelihood ratio test remains statistically significant).

Because the substantive results about how siblings' characteristics affect who helps and the type of help provided do not change much, we provide results of the more parsimonious, constrained model that does not distinguish between graduates and siblings, Model 1 in the table above. For comparison, however, we also provide the results of the first set of our analyses (looking at any help provided overall) for the full model, Model 3, in the Appendix of this paper. The results of these analyses can be seen in Appendix Tables A1 and A2. Table A1 is directly equivalent to Tables 5, in the main body of the paper, only with the graduate and the sibling disaggregated. The predicted probabilities in Table A2 may be compared to the predicted probabilities plotted in Figure 1 in the text. As mentioned above, the substantive interpretation of the findings does not differ if we consider the results of the full model instead of the ones described below.

## RESULTS

The graduate and sibling provide significant help to parents. Table 2 shows the percentages of graduates who provided help of each type to parents, among families in which parents did not live with any of their children. We see that 57 percent of graduates and 62 percent of siblings provided some form of help in 1993 and 62 percent of graduates and 52 percent of siblings provided help in 2004.

TABLE 2 HERE.

The middle panel of Table 2 shows the 1993 helping information for the 2004 subsample of graduates and siblings. The percentages for each type of help do not differ very much from that of the full analytic sample from 1993, which suggests that for this information, at least, the 2004 subsample is not particularly different from the 1993 full sample.

Table 3 shows how the graduate and sibling dyad help their parents. In a fairly large percentage of families – over 37 percent – both members of the dyad provide some help to parent(s). A clear gender divide in who provides care emerges. Among the brother-brother dyads, 23 percent provide no help to parents – a much higher percentage than the 16 percent of brother-sister dyads and 17 percent of sister-sister dyads who provide no help. This lack of help from the brother-brother dyads is also evident when we consider the percent of dyads where both children provide help. In 32 percent of brother-brother dyads, both siblings provide help as compared to 39 percent of sister-brother dyads and 38 percent of sister-sister dyads.

TABLE 3 HERE.

Descriptive statistics for the independent variables for the first set of analyses are displayed in Table 4. In these analyses we consider the gender composition of the dyad as well as the education and marital status of the members of the dyad to determine whether and the extent to which gender socialization and resources and competing demands (as measured by education and marital status) predict who helps parents. It is worth noting here that the parents in these analyses are already quite old – on average, they are 80 years old. However, only 16 percent are reported by the graduate as being in poor or very poor health and only 10 percent of them do not live on their own. This suggests that although these parents are older, for the most part, they are reasonably independent and in fair health. In all models, we control for parents' characteristics to account for heterogeneity of parents' needs.

TABLE 4 HERE.

### **Who Coordinates Help between Siblings?**

The first question we answer in this paper is: What predicts the coordination of help among siblings? To do this, we use multinomial logistic regression models to examine the likelihood of one, both, or neither member of a dyad of siblings providing help to parents as a function of gender and resources and abilities, net of the characteristics of their parents. We provide the results for key independent variables of this analysis for a composite measure of

“any help” provided to parents in Table 5<sup>6</sup>. Full results for all model variables are provided in Appendix Table A5.

TABLE 5 HERE.

Table 5 shows the odds of providing help to parents by gender, marital status, and education of the dyad for several different contrasts: the relative odds of one child helping vs. neither, the relative odds of both children helping vs. only one child, and the relative odds of both children helping vs. neither.

The education composition of the dyad does not significantly predict the number of children in the dyad who help parents. Although more highly educated children should have more time and resources to provide parents, they may provide more money than time help compared to their less educated counterparts (Couch, Daly, and Wolf, 1999; Laditka and Laditka, 2001; Zissimopoulos, 2001). Time "costs" more for the more educated and by focusing on time help, we may be missing out on other types of help more typically provided by highly educated children.

In dyads where at least one child is married (as compared to neither), the relative odds that one child will help as compared to neither helping doubles. Even though marriage represents a competing demand, there are several reasons why marriage might increase rather than reduce help. Siblings who are married may actually have a greater ability to help than a single sibling if, say, the single sibling has a child to care for. In addition, married brothers may have wives who persuade them to provide more help to parents. Finally, marital demands may be efficiently combined with care for parents. For instance, married individuals might shop or

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<sup>6</sup> Appendix Table A3 provides descriptive statistics for this analysis. We also estimated this model for the subset of cases in the longitudinal analysis, 1993-2004. Appendix Table A4 provides the results of the models for this same subset of respondents. Results are similar for the two models.

prepare meals for older parents and their own children at the same time. Consistent with these findings, other work using the WLS also shows that continuously married men are significantly more likely than other men to help their parents (Kahn, McGill, Bianchi, in progress).

Although marriage predicts helping behaviors, it does not predict the likelihood that both siblings of the dyad help. Marital status does not predict whether both children help vs. only one child or whether both children help compared to neither. In sum, although marriage is associated with more help overall, it does not predict whether help is shared among siblings.

The gender of the dyad is a completely different story altogether. Having at least one sister in the dyad increases the relative odds of one child helping compared to neither. It also increases the relative odds that *both* children in the dyad help compared to neither – and this effect is even stronger for the sister-brother dyad than for the sister-sister dyad. Having a sister in the dyad increases the relative odds of one child helping compared to neither by over 30 percent. In addition, a Wald test shows that this effect is nearly identical for sister-sister and sister-brother dyads. This finding provides some evidence that sisters may coordinate care within the family or indirectly persuade brothers to provide help they might not have provided on their own.

When we explore whether or not both members of the dyad help, we find that sister-brother dyads are the *most likely* to include two children who help compared to none, sister-sister dyads are slightly less likely, and brother-brother dyads are far less likely than the other two groups. For sister-sister dyads, the relative odds of both children helping parents compared to neither helping is 80 percent greater than for brother-brother dyads. For sister-brother dyads the equivalent relative odds are 64 percent greater than for brother-brother dyads. In addition, there is statistically significant difference between the effects of both children in the dyad helping

compared to neither for sister-brother and sister-sister dyads. This is consistent with the prior findings that sisters ensure the coordination of care within the family. However, sister-brother pairs may be better suited to provide a broader array of tasks than are sister-sister pairs. We explore this possibility below.

These gender differences are also shown as predicted probabilities in Figure 1. The predicted probabilities are calculated from the models summarized in Table 5, holding all variables at their means, except the gender composition of the dyad. It is clear from Figure 1 that brother-brother pairs are least likely to help parents at all and least likely for both brothers of the dyad to help than are siblings in dyads with other gender compositions. The predicted probabilities match the original percentages in Table 3 very closely.

FIGURE 1 HERE.

### **Is It *Having* a Sister that Matters or Having a Sister in the Observed Dyad?**

The results suggest that having a sister affects other siblings' helping behaviors. We examine this further by asking if it is having a sister at all or having one in the observed dyad. Although we do not have complete information on the helping behaviors of all siblings in the family, we do have information on the gender of all siblings. If what matters is whether or not there are any sisters, then we would expect that including a variable that identifies families with no sisters at all would reduce the difference between brother-sister and brother-brother pairs.

Table 6 shows the relative odds ratios for the gender variables for a model identical to that which produced Table 5, except with an additional dummy variable indicating whether there is at least one sister in the family. Comparing Table 6 to Table 5 shows that there is little change in the magnitude of the gender composition once a control for whether there are any sisters is

added into the model. This suggests that our results are not a function of merely having a sister but, rather, it is a function of having a sister who helps with these particular tasks. Although sisters are the most likely caregiver, not all sisters help in the same ways in all families. Ideally, we would like to control for having a sister who helps and not merely having a sister at all. Unfortunately, given the lack of information on helping behaviors of members of the family other than the graduate or the sibling, we cannot look into this further using these data.

TABLE 6 HERE.

### **Do Brothers and Sisters Differ in the Type of Help Provided to Parents?**

Table 7 replicates the analyses above, this time disaggregating help into practical help (which includes help with housework, yard work, errands, transportation, etc.) and socio-emotional help (i.e. support, encouragement, and advice). This allows us to examine within the family whether brothers and sisters specialize in the type of help they provide. Past research suggests that daughters may be more likely to provide parents with support and advice than sons and sons may be primarily responsible for work around the house and more “practical” tasks.

TABLE 7 HERE.

The first panel of Table 7 shows that sister-brother dyads are more likely to help with practical tasks than are sister-sister dyads. However, even with practical help, those with sisters help more. In sister-brother dyads, both siblings are more likely to provide practical help than brother-brother dyads. These findings again point to sisters as the potential coordinators of care

within the family. Having a sister increases the odds of parents receiving “practical” help from both members of the dyad.

The second panel of Table 7 shows evidence about the other side of help, the socio-emotional help typically provided by women. In sister-sister dyads compared to brother-brother dyads, both children are much more likely to provide parents with socio-emotional help than only one or neither child (2.5 and 3.2 times the odds, respectively). In addition, when it comes to socio-emotional support, sister-sister dyads are more likely than sister-brother and brother-brother dyads to include two siblings who help. There are stronger effects of sister-sister dyads on socio-emotional help than sister-brother dyads. Once again, brother-brother dyads are least likely to help parents. Interestingly, brothers in sister-brother dyads provide more socio-emotional help than those in brother-brother dyads. This may once again point to the possibility that sisters play a pivotal role in ensuring help of all kinds for parents, including emotional support either by directly or indirectly influencing brothers.

### **Are Sisters More Likely To Be “All Purpose” Helpers?**

In the next step of this analysis, we restrict information to the families where both siblings provide some type of helps to parents. We ask if sisters may be more likely to provide both types of help -- practical and socio-emotional -- than brothers are. In other words, are sisters more likely to be “all purpose” helpers? Table 8 displays the results of an investigation of “all purpose” helpers, those who provide both practical and socio-emotional help. Dyads may be made up of two all purpose helpers, only one, or no all purpose helpers. This time, we see that compared to all other gender pairs, sister-sister pairs are most likely to provide both types of help. Sister-sister pairs are more likely than brother-brother pairs to both provide help, as

compared to only one or neither helping. Once again sister-brother pairs do not lag too far behind, although they are significantly less likely to be all purpose helpers. As is consistent with our other findings, brother-brother pairs are, by far, least likely to be all purpose helpers.

TABLE 8 HERE.

### **Do Sisters Coordinate Care Help Over the Longer Run?**

The final question we address in this paper is: do the same processes that govern the coordination of care in a snapshot view remain true for the longer run? Due to our smaller sample sizes for this panel analysis, we focus on whether the gender effects remain over time for the “any help” variables. We do not have suitable statistical power to evaluate other characteristics of the dyad, including marital status and education, nor can we distinguish among types of help. Nonetheless, it is important to see if the gender effects we found to predict help in 1993 persist when we look at help over a longer time period of approximately 10-12 years.

Table 9 shows the breakdown of the dependent variable for this analysis, first overall and then by gender of the dyad. Although there are many ways help can be coordinated over time, to keep this analysis consistent with the analyses above, we consider a three category dependent variable distinguishing among dyads where only one sibling helps in both years, where both siblings help, and where neither is the primary provider of help over these two time points. We treat dyads as having only one helper if either the graduate or the sibling respondent helped in both years and the other did not help in either. Both respondents are helpers if they traded off across the years or if both helped in either year. This captures whether there is shared

responsibility and care for a parent. Neither is deemed the primary helper if neither helps in both years or if neither helps in one year and only one helps in the other year.

TABLE 9 HERE.

As Table 9 shows, when we adopt a long run rather than a snapshot view of families, we find a larger percentage of families where both children help. In sixty percent of the families in the sample, both members of the dyad helped parents with time, household help, or emotional support. Once, again, there are strong gender differences in the percentage who provided help. Only 18 percent of sister-sister dyads, for example, provide no help to parents, as compared to 29 percent of brother-brother dyads. In addition, in 66 percent of sister-sister dyads, both members of the dyad provide help, compared to only 54 percent of those in brother-brother dyads. Brother-sister dyads fall somewhere in between.

Table 10 displays the descriptive statistics for the independent variables in this analysis. The parents who are still alive are in worse health in 2004 than in the 1993 sample. Twenty-six percent of families have parents whose health deteriorated from not poor to poor health between waves. In addition, only 70 percent of parents continue to live independently. Parents' greater needs may be the reason that more children help.

TABLE 10 HERE.

The multivariate analysis investigates whether gender differences in help diminishes when parents need more help. Table 10 shows the relative odds ratios from a multinomial

logistic regression predicting whether one child helps, both help, or neither helps over a 10-12 year period. Given the smaller sample sizes, there are fewer statistically significant effects than in the prior analyses. However, the coefficients remain quite large.

Although in our 1993 analyses we found that sister-brother dyads were more likely to help than sister-sister dyads, these results suggest that there is no statistically significant difference between sister-sister and sister-brother dyads over the longer run as parents age. The important factor in predicting help over time is still having a sister in the dyad.

Having a sister in the dyad is also associated with a greater likelihood of one child helping compared to neither. This is true for both sister-sister and sister-brother dyads. Consistent with our prior results, brother-brother dyads are least likely to both provide help than are siblings from dyads of other gender compositions.

TABLE 11 HERE.

## **DISCUSSION**

This paper examines how siblings coordinate care for their older parents at a point in time and as they age. Help with housework or home repairs, transportation, errands and emotional support may not seem as important to older adults compared to activities of daily living (ADL) or instrumental activities of daily living (IADL) help. However, this broad measure of every day help allows us to capture the help that is relatively easy for children to provide. We do, in fact, find that most of the respondents in our sample provide at least some of this help to their parents. We also find strong and persistent gender effects in whether both siblings provide this help to their older parents.

Our findings provide evidence that parents typically receive help from more than one child. We also find evidence, consistent with that in qualitative studies, that sisters may coordinate or indirectly influence brothers to provide help. For overall help, having a sister in the dyad increases the odds of one child helping compared to neither by over 30 percent. In addition, individuals in sister-brother dyads are the most likely to both provide help, sister-sister dyads are slightly less likely, and brother-brother dyads are by far least likely than the other two groups.

Having a sister is also associated with greater odds that both siblings provide “practical” help. For socio-emotional support, the type of help for which women specialize as “kin keepers,” *both* sisters of a sister-sister dyad were likely to provide help than all other dyads. In addition, sister-brother dyads were more likely to provide socio-emotional support than brother-brother dyads. Women are not only specialists. We also find that sisters are more likely to provide both types of help than are brothers, in families where both sibling help their parents. Finally, when looking at help over a longer time period as parents needs grow, having a sister in the dyad continuous to be associated with whether both children help compared to only one or neither.

Many studies have looked at the role of gender in predicting helping behaviors. This paper goes beyond prior work by including information on the gender and characteristics of two siblings in the family and by including reports about help from each sibling. By looking within the family, we see that the gender composition of the family determines how much help parents receive and the types of help they receive. Although one child might be able to report on help for all the siblings in the family, it is likely that these proxy reports are not as reliable as self-reports. Self-reports of the provision of help are valuable as they avoid potential social

desirability bias of parents reporting on each child. We need information from multiple members of the family to reliably assess the extent of help available to older parents.

This work also has implications for understanding gender dynamics within families as it relates to help provided to parents. We find that daughters play an important role in the amount of help parents receive from their children. There are many reasons this occurs. Whether there are sons and daughters and the proportion of children of each sex may affect socialization within the family (Harris and Morgan, 1991) in ways that are reinforced in later life when children coordinate their parents' care. In addition, sisters may be engaged with all of their siblings (White and Riedmann, 1992) and therefore can more effectively orchestrate care for an older parent than can brothers alone. Finally, sisters may be role models to their brothers and may influence brothers to help through example. Most likely, it is some combination of factors that explains why families with at least one daughter have more children who help. Families are complicated, and the factors that explain gender dynamics in helping behaviors need to be examined further.

Future work should also consider the degree of relatedness of siblings in the family. This paper is limited to biologically related siblings, because the cohorts presented here mostly had children before the rise in divorce; however, the importance of gender for how help for parents is orchestrated may differ for step-siblings than biological siblings. For instance, siblings in step-families may have less shared socialization and less connectedness to their parents and to each other. In order to fully understand the extent to which the elderly are cared for, we must look within families of different types, and consider the complex family dynamics that determine the various ways help is coordinated by children for their aging parents.

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## TABLES AND FIGURES

**Table 1: Model Constraints Tested**

Model	Assumption	# Parameters	Outcome: Who helps?	Likelihood Ratio Tests*
1	No interaction, No heterogeneity	1 parameter	Someone, No one	M2=M4
2	No interaction, Heterogeneity	2 parameters	Grad, Sib, Other	M2=M1
3	Interaction, No heterogeneity	2 parameters	None, One, Two	M3≠M1
4	Interaction, Heterogeneity	3 parameters	Grad, Sib, Both, Neither	M3≠M2 M3≠M4

Notes: = indicates Likelihood Ratio Test of the difference between two models has  $p \geq 0.05$ ;  $\neq$  indicates  $p < 0.05$

**Table 2: Percent of Graduates and Siblings Who Provided Help to Parents, 1993 and 2004**

	Graduate Report	Sibling Report
<b>1993</b>		
Errands and transportation	39.7	41.8
Housework, yard work, repairs	26.2	31.1
Advice, encouragement, support	38.4	45.4
Any help	57.3	61.9
Number of cases*	1,523	1,523
<b>1993 information for 2004 Subsample</b>		
Errands and transportation	39.0	39.0
Housework, yard work, repairs	23.5	30.2
Advice, encouragement, support	40.5	45.2
Any help	57.5	62.8
Number of cases*	341	341
<b>2004</b>		
Errands and transportation	46.2	35.5
Housework, yard work, repairs	30.3	21.8
Advice, encouragement, support	43.5	37.8
Any help	61.9	51.6
Number of cases*	341	341

Notes: Questions about help refer to the past month.

\* Numbers of cases vary slightly for different types of help, due to missing data.

**Table 3: Who Provided Help to Parents Overall and by Gender Composition of Dyad, 1993**

	Overall (n=1,523)	Gender of Dyad		
		Sister- Brother (n=748)	Sister- Sister (n=436)	Brother- Brother (n=339)
Who Helps Parents?				
Neither sibling in dyad	17.93	16.04	17.20	23.01
One sibling	44.91	44.79	44.72	45.43
Both siblings	37.16	39.17	38.07	31.56

**Table 4: Descriptive Statistics for Analysis of Who Helps Parents, 1993 (N =1,523)**

		Mean or proportion	SD
Family Characteristics	Both parents are alive	0.28	
	Mother or father in poor or very poor health	0.16	
	Mother or father has college education of more	0.17	
	Age of older parent	80.30	(4.89)
	Living parent(s) live in their own home	0.90	
	Number of children in sibship	3.99	(2.07)
Random Sibling's Characteristics	Sibling <HS Degree	0.03	
	Sibling aged 30-49	0.34	
	Sibling aged 50-59	0.54	
	Sibling aged 60+	0.12	
Gender of Dyad	Brother-Brother	0.22	
	Sister-Brother	0.49	
	Sister-Sister	0.29	
Education of Dyad	Neither child in dyad has a college degree	0.54	
	One child in dyad has a college degree	0.29	
	Both children in dyad have a college degree	0.18	
Marital Status of Dyad	Neither child in dyad is married	0.03	
	One child in dyad is married	0.28	
	Both children in dyad are married	0.69	

**Table 5: Parameter Estimates for Selected Independent Variables from Multinomial Logistic Regression of Who Helps Parent (n=1,523)**

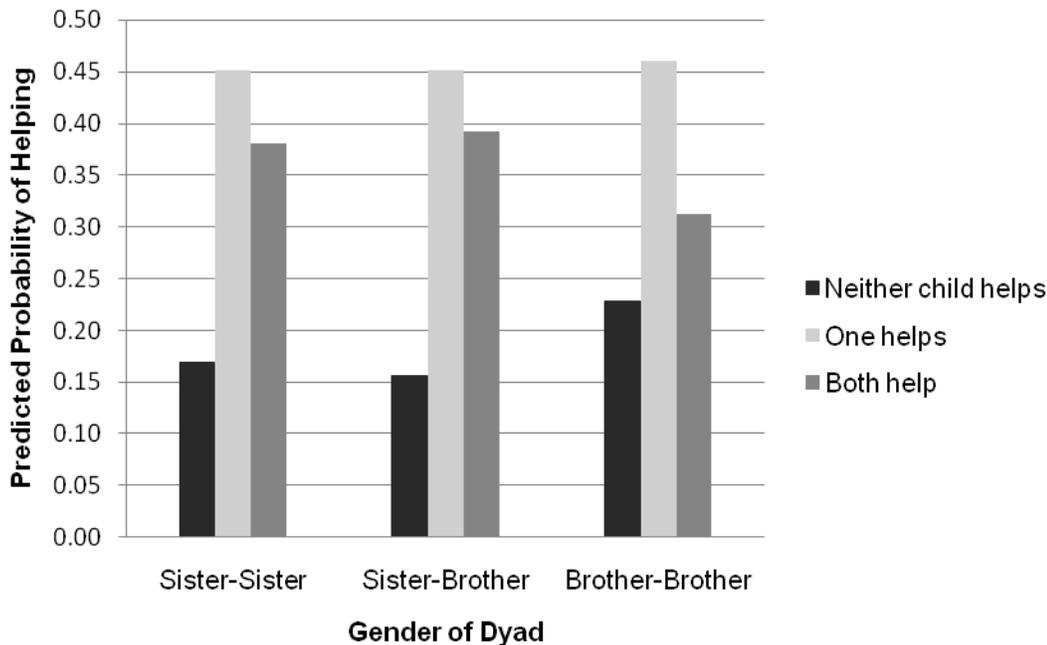
Characteristics of Dyad		Relative Risk of Helping		
		One Child vs. Neither	Both vs. One Child	Both vs. Neither
Education	One child is college graduate (ref: Neither)	1.01	0.95	0.97
	Both children are college graduates (ref: Neither)	0.88	1.03	0.92
Marital Status	One child is married (ref: Neither)	2.29	0.58	1.34
	Both children are married (ref: Neither)	2.42*	0.68	1.64
Gender	Sister-sister dyad (ref: Brother-brother)	1.33	1.24	1.64* <sup>a</sup>
	Sister-brother dyad (ref: Brother-brother)	1.34*	1.28	1.83* <sup>a</sup>

Notes: Results are from a multinomial logistic regression model predicting who helps parents (one child, both, neither). Variables are defined in text.

\*  $p < 0.05$  +  $p < 0.10$

<sup>a</sup> Wald test has  $p < 0.05$

**Figure 1: Predicted Probabilities of Who Helps Parent, by Gender of Dyad, 1993**



**Table 6: Parameter Estimates for Gender Composition of Dyad from Multinomial Logistic Regression of Who Helps Parent Net of Whether There is Any Sister in the Family (n=1,523)**

	Relative Risk of Helping		
	One Child vs. Neither	Both vs. One Child	Both vs. Neither
Any sister in the family, dummy	0.92	0.93	0.86
Sister-sister dyad (ref: Brother-brother)	1.37	1.28	1.75* <sup>a</sup>
Sister-brother dyad (ref: Brother-brother)	1.47+	1.32	1.94* <sup>a</sup>

Notes: Results are from a multinomial logistic regression model predicting who helps parents (one child, both, neither). Variables are defined in text.

\* p<0.05 + p<0.10

<sup>a</sup>Wald test has p<0.05

**Table 7: Parameter Estimates for Gender Composition of Dyad from Multinomial Logistic Regression of Who Helps Parent, By Gender or Dyad and Type of Support (n=1,523)**

		Relative Risk of Helping		
		One Child vs. Neither	Both vs. One Child	Both vs. Neither
Practical	Sister-sister dyad (ref: Brother-brother)	1.15	1.18	1.36 <sup>a</sup>
	Sister-brother dyad (ref: Brother-brother)	1.25	1.27	1.59* <sup>a</sup>
Socio-Emotional	Sister-sister dyad (ref: Brother-brother)	1.26 <sup>a</sup>	2.49* <sup>a</sup>	3.16* <sup>a</sup>
	Sister-brother dyad (ref: Brother-brother)	1.51* <sup>a</sup>	1.88* <sup>a</sup>	2.84* <sup>a</sup>

Notes: Results are from a multinomial logistic regression model predicting who helps parents (one child, both, neither). Variables are defined in text.

\* p<0.05 + p<0.10

<sup>a</sup>Wald test has p<0.05

**Table 8: Parameter Estimates for Gender Composition of Dyad from Multinomial Logistic Regression of Does Gender of Dyad Predict the Likelihood of Being an All Purpose Helper (n=566)**

	Relative Risk of Helping		
	One Child vs. Neither	Both vs. One Child	Both vs. Neither
Sister-sister dyad (ref: Brother-brother)	1.96* <sup>a</sup>	2.48* <sup>b</sup>	4.87* <sup>a</sup>
Sister-brother dyad (ref: Brother-brother)	1.89* <sup>a</sup>	1.88+ <sup>b</sup>	3.56* <sup>a</sup>

Notes: Results are from a multinomial logistic regression model predicting who helps parents (one child, both, neither). Variables are defined in text.

\* p<0.05 + p<0.10

<sup>a</sup>Wald test has p<0.05

<sup>b</sup>Wald test has p<0.10

**Table 9: Who Provided Help to Parents, 1993 --> 2004**

	Overall (n=341)	Gender of Graduate and Sibling		
		Sister- Brother (n=164)	Sister- Sister (n=105)	Brother- Brother (n=72)
Who Helps Parents?				
One Child in Dyad	18.48	20.73	16.19	16.67
Both Child	59.82	58.54	65.71	54.17
Neither Children	21.70	20.73	18.10	29.17

**Table 10: Descriptive Statistics for Analysis of Help Children Gave to Parents, 1993--> 2004 (N =341)**

		Mean or proportion	SD
Parents' Characteristics	One parent died bet. 1993 and 2004	0.29	
	Parent switched from good to poor health bet. 1993 and 2004	0.26	
	Total number of children in family (2004)	3.89	(1.97)
	Living parent(s) live in their own home (2004)	0.70	
Sibling's Characteristics	Sibling aged 30-49 in 1993	0.39	
	Sibling aged 50-59 in 1993	0.57	
	Sibling aged 60+ in 1993	0.04	
Gender of Dyad	Brother-Brother	0.21	
	Sister-Brother	0.48	
	Sister-Sister	0.31	

**Table 11: Parameter Estimates for Gender Composition of Dyad from Multinomial Logistic Regression of Who Helps Parent (n=341), 1993--> 2004**

	Relative Risk of Helping		
	One Child vs. Neither	Both vs. One Child	Both vs. Neither
Sister-brother dyad (ref: Brother-Brother)	1.89	0.80	1.51 <sup>NS</sup>
Sister-sister dyad (ref: Brother-Brother)	1.60	1.26	2.01 <sup>NS</sup>

Notes: Results are from a multinomial logistic regression model predicting who helps parents (one child, both, neither). Variables are defined in text.

\* p<0.05 + p<0.10

<sup>NS</sup> Indicates Wald test with p>0.10

**APPENDIX**

**Table A1: Parameter Estimates for Selected Independent Variables from Multinomial Logistic Regression of Who Helps Parent (n=1,523)**

		Relative Risk of Helping					
		Graduate vs. Sibling	Graduate vs. Neither	Sibling vs. Neither	Both vs. Graduate	Both vs. Sibling	Both vs. Neither
Gender (ref: neither female)	Graduate is female	1.54+	1.89*	1.23	1.08	1.66*	2.03*
	Sibling is female	0.65+	1.04	1.59*	1.57*	1.03	1.63*
	Both Graduate and Sibling are female	0.96	1.31	1.37	1.28	1.22	1.67*
Marital Status (ref: neither married)	Graduate is married	1.63	3.30*	2.02	0.45	0.73	1.47
	Sibling is married	1.24	2.32	1.88	0.53	0.66	1.24
	Both Graduate and Sibling are married	1.06	2.55+	2.39+	0.66	0.71	1.69
Education (ref: neither college)	Graduate college graduate	1.51+	1.39	0.92	0.81	1.22	1.13
	Sibling college graduate	1.42	1.35	0.76	0.74	1.05	0.80
	Both Graduate and Sibling college graduate	1.27	0.97	0.77	0.90	1.14	0.88

Notes: This table shows results of a disaggregated version of the model used to produce Table 5 in the main text of the paper.

Notes: Results are from a multinomial logistic regression model predicting who helps parents (graduate, sibling, both, neither). Variables are defined in text.

\* p<0.05 + p<0.10

**Table A2: Predicted Probabilities of Who Helps Parent, by Gender of Dyad, 1993**

	Who Helps?			
	Graduate	Sibling	Both	Neither
Graduate is female	0.2410	0.1967	0.4301	0.1322
Sibling is female	0.1531	0.2946	0.3992	0.1531
Both Graduate and Sibling are female	0.1905	0.2451	0.4269	0.1374
Neither Graduate nor Sibling are female	0.2037	0.2529	0.3152	0.2282

Notes: Families with more than one child where no child coresides with a parent.

**Table A3: Descriptive Statistics for Analysis of Who Helps Parents, 1993 Variables for 2004 Subsample (n=341)**

		Mean or proportion	SD
Family Characteristics	Both parents are alive	0.39	
	Mother or father in poor or very poor health	0.07	
	Mother or father has college education of more	0.13	
	Age of older parent	78.73	(4.11)
	Living parent(s) live in their own home	0.98	
	Number of children in sibship	4.00	(2.03)
Random Sibling's Characteristics	Sibling <HS Degree	0.02	
	Sibling aged 30-49	0.39	
	Sibling aged 50-59	0.57	
	Sibling aged 60+	0.04	
Gender of Dyad	Brother-Brother	0.21	
	Sister-Brother	0.48	
	Sister-Sister	0.31	
Education of Dyad	Neither child in dyad has a college degree	0.54	
	One child in dyad has a college degree	0.30	
	Both children in dyad have a college degree	0.16	
Marital Status of Dyad	Neither child in dyad is married	0.03	
	One child in dyad is married	0.26	
	Both children in dyad are married	0.71	

**Table A4: Parameter Estimates for Selected Independent Variables from Multinomial Logistic Regression of Who Helps Parent run on 2004 subsample only (n=341)**

		<b>Relative Risk of Helping</b>		
		One Child vs. Neither	Both vs. One Child	Both vs. Neither
Gender (Ref: Neither Sister)	Sister-sister dyad	0.88	1.14	1.03
	Sister-brother dyad	0.64	1.56	1.32
Marital Status (Ref: Neither Married)	One child is married	0.60	1.68	5.23+
	Both children are married	0.43	2.31	4.81+
Education (Ref: Neither College)	One child is college graduate	1.01	0.99	2.10+
	Both children are college graduates	1.00	1.00	0.79

Notes: Results are from a multinomial logistic regression model predicting who helps parents (one child, both, neither). Variables are defined in text.

\* p<0.05 + p<0.10

**Table A5: Full Model Results for Parameter Estimates for Selected Independent Variables from Multinomial Logistic Regression of Who Helps Parent (n=1,523)**

		Relative Risk of Helping		
		One Child vs. Neither	Both vs. One Child	Both vs. Neither
Education (ref: Neither College)	One child is college graduate	1.01	0.95	0.97
	Both children are college graduates	0.88	1.03	0.92
Marital Status (ref: Neither Married)	One child is married	2.29	0.58	1.34
	Both children are married	2.42*	0.68	1.64
Gender (ref: Neither Sister)	Sister-sister dyad	1.33	1.24	1.64* <sup>a</sup>
	Sister-brother dyad	1.34*	1.28	1.83* <sup>a</sup>
Family Characteristics	Both parents are alive	1.22	1.07	1.31
	Mother or father in poor or very poor health	1.00	1.09	1.09
	Mother or father has college education of more	0.92	0.92	0.84
	Age of older parent	1.02	1.00	1.02
	Living parent(s) live in their own home	1.54+	1.22	1.89*
	Number of children in sibship	0.95	0.92*	0.87*
Random Sibling's Characteristics	Sibling <HS Degree	0.58	0.92	0.54
	Sibling aged 30-49 (reference 60+)	0.94	1.30	1.22
	Sibling aged 50-59 (reference 60+)	0.96	1.07	1.03

Notes: Full results from a multinomial logistic regression model predicting who helps parents (one child, both, neither). Results for first three panels (i.e. education, marital status, and gender) are presented in Table 5 in the text.

\* p<0.05 + p<0.10

<sup>a</sup> Wald test has p<0.05