Caring for a dependent elderly parent : Care arrangements and sibling interactions in France

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As the population ages, the question of caring for dependent older adults is becoming a major issue for society. The French government has introduced policies on the issue, but family and children provide much of the care themselves. When a person becomes dependent, does the number and gender distribution of their children have an impact on the care they receive? It is known that the majority of caregivers are women, but what happens with single-sex sibships? Do older and younger siblings behave differently? Taking data from the Handicap-Santé survey on disability and health, Quitterie ROQUEBERT, Romeo FONTAINE *and* Agnès GRAMAIN *highlight asymmetries of both gender and birth order in the care children give their parents, with differences according to the type of help provided.*

Informal care provision is an essential resource for the care of dependent older adults today.(1) This unpaid care provided by family and friends is more frequent, more intense and more diverse that the formal care provided by professional, paid carers. According to the French Handicap-Santé survey on disability and health (INSEE-DREES, 2008-2009), of the 3.9 million people aged 60 or over receiving regular care at home, 80% are helped by a close relation while 50% receive professional help (Soullier and Weber, 2011). Median care time provided by informal caregivers amounts to 1h 40min per day compared to 0h 35 min from paid carers. On average, informal caregivers help with four practical daily life tasks; paid carers with two (Fontaine, 2011). This pattern is not specific to France. Despite the diversity of social welfare

(1) The term "loss of autonomy" is often used in connection with dependence in older adults. We use the term "dependence" here in reference to the state of dependence rather than the process of losing autonomy.

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systems and care norms across Europe, informal care plays a predominant role in the care of dependent older adults in all European countries (Colombo et al., 2011).

Given the key role of family members in the care of dependent older adults, it is useful to examine the structure of informal care arrangements and the underlying process that shapes them. Understanding this process is especially important in a demographic context of changes in family composition due to decreasing lifetime fertility and an expected increase in the number of dependent older adults living with a spouse. Whether or not children help their parents and how that care is shared among them may depend on so-called "structural" determinants that influence a person's decision to help a parent, independently of other family members' decisions. For example, the caregiving decision may be affected by individual characteristics such as the child's family situation and employment status, by characteristics of the parent such as their gender and degree of dependence, or variables to do with the sibship, such as its gender composition.(2) But the care decision may also be linked to the help that other potential carers can give. These "endogenous interactions" may significantly alter the expected impact of public policy and demographic changes. For example, if the children decide that at least one of them will play a caring role, then a smaller number of siblings will have little effect, either on the care provided by the main caregiver or on whether the dependent parent receives informal care.

Our study aims to shed light on several questions about family care arrangements for an elderly parent. How does the children's involvement(3) adjust to family characteristics? In a sibship of two, how are the respective decisions of each sibling interlinked? Do patterns of involvement differ by birth order? Are the principles that determine care arrangements the same for all types of care?

We first describe the care arrangements set up by siblings to cope with the dependence of an elderly parent, as reported by dependent parents interviewed for the French Handicap-Santé (disability and health) survey. We examine the extent to which sibling care arrangements are sensitive to family characteristics (number of children and whether the parent has a spouse present). Our analysis then focuses on the determinants of caregiving decisions by children with only one sibling, taking into account possible endogenous interactions in addition to structural determinants. By pinpointing endogenous interactions we are able to show that siblings' caregiving behaviours are interdependent. Adopting an original approach, we differentiate these determinants by birth order; we compare the effects according to two

(2) By taking the gender composition of the sibship into account we can examine whether being a woman has the same impact on caregiving behaviour when the other sibling is either a man or a woman.

(3) We use the term "involvement" to indicate whether or not help is provided, regardless of the intensity, frequency or type of help.

definitions of caregiving, one covering several types of care (help with daily life tasks, financial help, emotional support) and one targeted solely on help with daily life tasks.

I. Modelling sibling interactions

The earliest studies of how care arrangements are formed sought to describe how the "main caregiver" is designated, on the assumption that only one sibling is designated as such. They were designed to show the effect of the parent's and child's individual characteristics on the child's caregiving behaviour (Engers and Stern, 2002; Hiedemann and Stern, 1999; Pezzin and Steinberg Schone, 1999; Sloan et al., 1997; Stern, 1994). However, empirical data have invalidated that approach: two or more children often provide help at the same time. In Europe, in 2004, one in five dependent older adults living alone and having two children were receiving care from both (Fontaine et al., 2009). In 2008, the French Handicap-Santé survey (see below) found a similar pattern among caregiving children with one brother or sister in France. So an analysis of how family care arrangements are formed should not be restricted to a single caregiver, even if he/she is the main one.

The possibility of shared caregiving by more than one sibling raises the question of whether the children are acting independently of each other: is a child's decision to help affected by the caregiving behaviour of his or her siblings? This question has led some authors to produce models inspired by game theory, taking into account agents' expectations of other siblings' caregiving decisions (Byrne et al., 2009; Checkovich and Stern, 2002; Engers and Stern, 2002; Hiedemann and Stern, 1999; Pezzin et al., 2007). Where behaviours are interdependent, there may be various types of connection: does help given by one child substitute for, or add to, that of other siblings? Sociological analysis has brought to light arrangements where children are involved "as a team" and others where one or more siblings withdraw when others are caring for the parent (Pennec, 2007). Interactions may not necessarily be homogeneous: do all siblings respond in the same way to the involvement of other siblings, regardless of birth order? Fontaine et al. (2009) used an original model, one that allowed for such asymmetry. Using data from the Survey on Health, Ageing and Retirement in Europe (SHARE), they revealed differences of behaviour between siblings in the specific case where there are two siblings and the dependent elderly parent is living without a spouse.

To identify endogenous interactions empirically it must be possible to isolate them from other factors liable to affect care behaviour. Manski (2000) identifies three mechanisms that can explain the connections between behaviours within a group. The first consists of "endogenous interactions", where the behaviours of individuals in a group are directly interdependent.

The second consists of "contextual interactions", where the characteristics of one individual have a direct impact on the behaviour of another group member. For example, someone may think their unemployed brother has enough time to help the parent, and so decide not to get involved, even if, in fact, the brother is not providing any help. A third mechanism is that of "correlated effects", where a context is shared by all the group members, though it may be imperfectly observed in a survey. The particularities of the shared family context may affect all the siblings' decisions simultaneously: this context includes the parent's need for help and the presence or absence of a spouse, but also family norms, which all the siblings may share but which are often unobserved.

To analyse the basis on which family members share the care of a dependent person, it is essential to isolate endogenous interactions from other sources of correlation. The presence of endogenous interactions has one major consequence: any factor that alters the involvement of one family member will also, indirectly, alter the caregiving behaviour of the others. When assessing public policies, the existence of endogenous interactions means that the indirect effects of carer support policies must be taken into account. A policy focused on working caregivers will indirectly affect retired potential caregivers who are interacting with a working sibling. As the population ages, it is also crucial to isolate the effects of endogenous interactions when seeking to project future levels of informal care resources: where one family member reduces his or her involvement, others may increase theirs in compensation. This challenges the near-consensus view that the supply of informal care is destined to shrink. As Manski points out, it is not easy to identify endogenous interactions statistically; it requires a rich data set and purpose-built models.

II. Study of care provided to dependent older adults by their children, from Handicap-Santé survey data

The Handicap-Santé (disability and health) survey carried out by INSEE and DREES in France in 2008-2009 provides the necessary data for analysing endogenous interactions. Its focus is on health problems and difficulties of daily living in the French population. Here we use the household section of the survey (HSM), which concerns people living in ordinary households. We look at the care received by dependent older adults who have at least one child, and we discuss the definitions of care used in the survey.

1. The survey sample

Our analysis concerns family care arrangements for dependent older adults living at home and having at least one child – a situation where informal care

plays a major role and where various care arrangements can emerge. For each respondent, as well as a set of individual characteristics, we know the main kinds of formal and informal care they are receiving. Respondents were also asked about their families. We therefore have a set of sociodemographic data on each of their children (sex, age, family situation, employment situation, whether living with or near the respondent), whether they are involved with care and, if so, in what way (helping or not, type of help, frequency, time allocation). This information on each child is essential for addressing the determinants of their caregiving decisions.

Studying older adults living at home involves making a selection from the total population of dependent older adults: although those living at home are a majority in numerical terms, they are more often women, are less dependent, and have larger family networks than those in residential care (Désesquelles and Brouard, 2003; Duée and Rebillard, 2006). Our analysis of care arrangements should therefore be read as partial, conditional on the older person's decision to live at home.

In our analysis "older" adults are all those aged 60 or over. This threshold was chosen by reference to French law: 60 is the age at which French people become eligible for senior citizens' benefits (Tenand, 2016).(4) We regard as "dependent" any person who reported needing human help to perform at least one activity of daily living, whether a basic activity of daily living (ADL) – eating and drinking, dressing, going to the toilet, going to bed and getting up, sitting down and standing up – or an instrumental activity of daily living (IADL) – preparing meals, shopping, doing housework, managing medicines, going outside, taking public transport, using a computer or telephone. Under this broad definition, which goes beyond personal care and help with domestic chores, 10.6% people aged 60 or over (2,226 individuals in the sample) were dependent in 2008.(5)

Table 1 shows the distribution of dependent older adults by conjugal situation and number of living children. The description of care arrangements between siblings in the next section concerns only the 1,883 dependent older adults who had at least one child. The analysis of the structural determinants and interactions that follows concerns only those dependent older adults who had precisely two children; after excluding twin sibships, the final sample comprised 479 sibships.(6)

(4) The threshold of 60 meant that a distinction had to be made between dependent older adults and older disabled people. In the case of an older disabled person, the family care arrangement is likely to predate their reaching the age of 60 and to have features specific to the type of disability. Based on available information on welfare benefits received by dependent older adults, 13 respondents aged 60 or over and in receipt of a disability allowance were identified and removed from the sample of dependent older adults.

(5) 23.8% of these people said they needed help to perform at least one ADL. Of the rest, 79.1% had at least two IADL limitations.

(6) Of the 492 dependent older adults with two adult children, 13 had twins; these sibships were excluded from the analysis by birth order.

Table 1. Dependent older adults by conjugal situation and number of children

Number of living children of the dependent older adult	All		No spouse		With spouse	
	Number of observations in the sample	Frequency in the population (%)	Number of observations in the sample	Frequency in the population (%)	Number of observations in the sample	Frequency in the population (%)
No children	307	14.9	218	19.1	89	9.3
1 child	425	20.0	237	21.5	188	18.1
2 children	492	24.8	241	22.5	251	27.6
3 children	351	16.1	173	14.9	178	17.8
4+ children	615	24.2	327	22.0	288	27.2
All	2,190	100	1,196	100	994	100

Note: Weighted frequencies.
Sample: 2,190 dependant older adults living in ordinary households, with no minor children.
Source: Handicap-Santé survey, households section (INSEE-DREES, 2008).

2. Definition of caregiving child

In the survey, informal care corresponds to regular care received in a context of dependence. Respondents reported it by answering the question "Are there people (family, friends etc.) other than paid carers who regularly help you perform certain daily life tasks, who help you financially or materially or who give you emotional support owing to a health problem or impairment, including people who live with you?" Respondents receiving care could list up to ten informal caregivers. The caregivers we consider here are the children included in that list.(7) Our definition of care or help is thus based on the parents' responses. This is not a neutral measure. In particular, depending on the characteristics of the respondents and their families, there is the risk that some care is not reported (e.g. if the parent takes their child's help for granted and does not mention it) and a risk of over-reporting (e.g. if the respondent wants to give the impression of being well cared for by their children) (Beliard et al., 2012). Also, this measure tells us nothing about how freely the caregivers decided to provide their support, or the nature or extent of the help given.

Some children living with their parent were not reported as caregivers.(8) We assume that co-residence leads in practice to caregiving, at least for daily life tasks, and we therefore classed as caregivers all children living with their

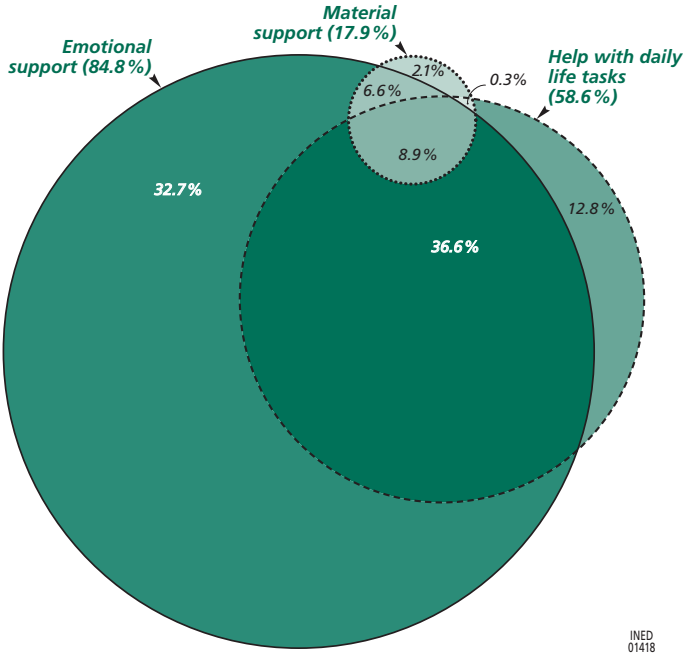
(7) We eliminated those cases (3 observations) where not all the children were mentioned in the list of caregivers and the respondent also reported having more than ten informal caregivers (not listed). In those cases it is possible that actual help from one of the children was not observed.

(8) Among all the sibships with an elderly dependent parent, 7% of children with an elderly parent or parents were living with them and 4% were living with them but not reported as caregivers. In sibships of two, 10% of children were living with their parent(s) and 3% were living with them without being reported as caregivers (the proportions were similar for elder and younger siblings).

parent.[9] Children living with their parent but not reported as caregivers represented 10% of the children we considered as caregivers[10].

The definition used in the survey covers various kinds of help. It includes not only help with daily life tasks (personal care, dressing and housework) but also material or financial help and emotional support. This diversity matches the broad range of activities used for defining dependence. The questionnaire distinguishes between types of help which are often provided simultaneously by the children reported as caregivers:[11] nearly 85% gave at least emotional support, 59% helped with daily life tasks and 18% gave financial or material help (Figure 1). Few children gave financial or material help without also giving another kind of help, so their

Figure 1. Types of care provided by caregiving children to a dependent elderly parent



Notes: Weighted frequencies. A child is considered a caregiver here only if he/she is reported as such by the parent (all types of care). The 157 children in the sample who were living with their parent and not reported as caregivers are not included.

Interpretation: 12.8% of children caring for a dependent elderly parent provide help only with daily life tasks. All in all, 58.6% (12.8% + 36.6% + 0.3% + 8.9%) of caregiving children provide help at least with daily life tasks.

Sample: 1,341 children of a dependent elderly adult who were reported as caregivers by their parent.

Source: Handicap-Santé survey, households section (INSEE-DREES, 2008).

(9) This choice led us to exclude families where one child was still a minor (1.6% of families with a dependent elderly parent and 1.2% of sibships of two with a dependent elderly parent), for whom the relationship between co-residence and caregiving is ambiguous.

(10) 157 children in all and 27 children in sibships of two.

(11) Other than co-resident children.

inclusion only marginally alters the definition of care. The inclusion of emotional support as a form of caregiving has more impact, because for one-third of children reported as caregivers it is the only form of help provided.

The results presented are initially based on a broad definition of care covering any or all of the three types of care. However, because the question of coordination among potentially caregiving siblings probably arises more often in relation to daily life tasks, a narrower definition was used for the analysis of endogenous interactions, taking into account only children reported as providing this particular type of help.

III. Care arrangements among siblings

Caregiving frequencies can be measured either as the proportion of children providing care (Table 2) or as the proportion of parents receiving care from at least one child (Table 3). Comparing these frequencies by parent's conjugal situation and sibship size reveals certain features of such care arrangements in France.

Unsurprisingly, parents living without a spouse receive more care from their children, whether this is measured from the parental side or the children's side. The proportion of caregiving children (Table 2) falls by up to one-half when the parent is living with a spouse, regardless of sibship size. Over half

Table 2. Proportion of adult children with a dependent elderly parent who provide care, by size of sibship and parent's declarations (all types of help)

Number of dependent elderly parent's living children	Number of observations in the sample (child)	Number of caregiving or co-resident children in the sample	Proportion of children providing care (%)	Proportion of caregiving children who are parent's only caregiving child (%)
Parent living without a spouse and having				
1 child	237	148	56.0	100
2 children	482	208	38.5	42.0
3 children	519	162	21.1	38.4
4+ children	1,844	451	26.1	26.7
Overall	3,082	969	30.4	44.8
Parent living with a spouse and having				
1 child	188	49	26.4	100
2 children	502	104	15.0	48.9
3 children	534	106	17.9	31.9
4+ children	1,634	270	15.1	34.3
Overall	2,858	529	16.4	43.4

Notes: Weighted frequencies. A child is considered a caregiver if he/she is reported as a caregiver by the parent (all types of care) or is living with the parent.
Interpretation: In sibships of two whose dependent elderly parent is living without a spouse, 38.5% of children are caregivers and 42% of these are the only caregiver in the sibship.
Sample: 5,940 adult children with a dependent elderly parent living in an ordinary household.
Source: Handicap-Santé survey, households section (INSEE-DREES, 2008).

Table 3. Proportion of dependent elderly parents receiving care from at least one child

Number of dependent elderly parent's living children	Number of observations in the sample (parent)	Proportion of parents receiving care rom at least 1 child (%)	Among parents receiving care, proportion receiving care from only 1 child (%)
Parent living without a spouse and having			
1 child	237	52.6	100
2 children	241	51.2	63.4
3 children	173	37.8	58.9
4+ children	327	67.0	56.0
All	978	53.4	69.9
Parent living with a spouse and having			
1 child	188	24.7	100
2 children	251	19.1	62.9
3 children	178	22.7	42.7
4+ children	288	41.5	67.1
All	905	27.6	68.2

Notes: Weighted frequencies. A child is considered a caregiver if he/she is reported as such by the parent (all types of care) or is living with the parent.
Interpretation: 51.2% of dependent elderly parents living without a spouse and having two children receive care from at least one child. Of these, 63.4% receive care from only one child.
Sample: 1,883 dependent elderly parents living in ordinary households, having at least one child and no minor children.
Source: Handicap-Santé survey, households section (INSEE-DREES, 2008).

the only children (no siblings) whose dependent parent has no spouse are reported as caregivers, but the proportion is only 1 in 4 if the parent is living with a spouse. The same pattern is found among children with siblings. The proportion of parents reporting receipt of care from at least one of their children (Table 3) is 27.6% for those living with a spouse versus 53.4% for those living without a spouse. Conjugal situation also affects the relationship between sibship size and caregiving by children. Where the parent is living without a spouse, the proportion of children providing care decreases as sibship size increases (Table 2), falling from 1 in 2 among only children to 38.5% among children in sibships of two and about 1 in 4 among those in larger sibships. For parents living with a spouse, the proportion of caregiving children among those with one or more siblings is fairly stable, regardless of sibship size (about 1 child in 6), slightly less than among only children (1 in 4).

On the other hand, although children are more involved in caring for a parent with no spouse, the percentage of multi-carer situations does not increase: on average, 44.8% of caregiving children are the only sibling involved when the parent is on his/her own, compared to 43.4% when he/she is with a spouse (Table 2). Similarly, among parents who report being helped by at least one child (Table 3), the proportion who report only one caregiving child is 69.9% if they are living without a spouse but 68.2% if they live in a couple.

Where there are two or more siblings, a comparison of the figures calculated from the children's side with those calculated from the parental

side suggests that interactions exist. The proportion of parents helped by at least one child is always less than what should be observed if the reports concerning the different children of a single sibship were independent.(12) Whether the parent is living with or without a spouse, having two or three children rather than just one does not particularly increase the probability of receiving care.

Do the patterns shown here concern all siblings in the same way, whatever their birth order (Table 4)? In sibships of two, the younger sibling is involved in caring for the dependent elderly parent significantly more often than the elder one. These behavioural differences are partly due to differences in individual characteristics by birth order, as Table 5 suggests, or to given characteristics having different effects depending on birth order. The fact that younger siblings are more frequently involved reflects the fact that they are more likely to be the only caregiver. This result raises the question of whether interactions within the sibship differ by birth order: is it because elder and younger siblings react differently to their brother's or sister's caregiving behaviour that younger siblings are more likely than elder ones to be the only caregiver? There are also differences in involvement by birth order for sibships of three, where the probability of being involved (either in general or as sole caregiver) increases from eldest to youngest. These differences show that to

Table 4. Proportion of children providing care, by birth order

	Sibships of two			Sibships of three			
	Elder	Younger	Chi-squared test of independence (critical probability)	Eldest	Middle	Youngest	Chi-squared test of independence (critical probability)
Proportion of caregiving children (%)	25.1	30.1	0.09	18.0	17.4	21.6	0.31
Proportion of children who are the only caregiver (%)	9.4	14.4	0.09	5.4	6.2	8.3	0.55
Number of observations	479	479	-	335	335	335	-

Notes: Weighted frequencies. When the critical probability is less than 0.10, the difference between the proportions is significant at 10%. A child is considered a caregiver if so reported by the parent (all types of help) or is living with the parent.
Interpretation: 25.1% of elder siblings in sibships of two with a dependent elderly parent are caregivers. 9.4% of elder siblings in sibships of two with a dependent elderly parent are caregivers with no help from their sibling (thus 15.7% of elder siblings are caregivers sharing care with their siblings).
Sample: 1,963 adult children in sibships of two or three, with a dependent elderly parent living in an ordinary household.
Source: Handicap-Santé survey, households section (INSEE-DREES, 2008).

(12) With two siblings and a parent living without a spouse, 38.5% of children are reported as caregivers (Table 2). If the parent's response regarding the elder sibling was independent of that for the younger, at least one child would be reported in 62.2% of sibships ($0.385 + 0.385 - 0.385^2$). In the corresponding subsample, this is the case of only 51.2% of sibships (significant difference with error risk below 5%).

Table 5. Sociodemographic characteristics of adult children with a dependent elderly parent (sibships of two)

	Elder	Younger	Critical probability with test for equality of means
Age (years)[a]	51.6	46.7	0.00
Woman (%)	52.2	53.4	0.70
With a spouse (%)	71.8	68.7	0.29
Has children (%)	80.4	75.2	0.05
Mean number of children[b]	2.2	2.0	0.01
Active in labour market (in work or unemployed) (%)	67.4	75.8	0.00
Lives with parent (%)	9.4	10.0	0.74
Lives in a different region to parent (%)	28.0	22.1	0.04

Notes: Unweighted means and frequencies. When critical probability is less than 0.10, the difference between the means is significant at 10%.
(a) Mean age calculated for children whose ages were given by the parent (469 elder siblings, 474 younger).
(b) Of those with children (385 elder siblings, 360 younger).
Sample: 479 elder siblings and 479 adult younger siblings in sibships of two with a dependent elderly parent.
Source: Handicap-Santé survey, households section (INSEE-DREES, 2008).

identify the determinants of caregiving, it is important to distinguish type of sibship and birth order.

Focusing on sibships of two, we examine the three potential sources of differences in involvement by birth order, i.e. differences in individual characteristics, in the impacts of individual and family characteristics on the caregiving decision, and in the ways one sibling adjusts to the behaviour of the other.

IV. Explaining family arrangements in sibships of two

Our statistical analysis to isolate endogenous interactions concerned the specific case of sibships with two members. Not only are there marked differences in caregiving behaviour by birth order in such sibships, but this approach also avoids the need for restrictive and hard-to-test formalization hypotheses that would be needed to establish a method for aggregating behaviours in sibships of more than two. With a sibship of two there is, automatically, only one "alter" to consider. Moreover, two-child families will be the most frequent arrangement in the coming years: according to the Famille et Logements (family and housing) survey (INSEE-INED, 2011), among people born between 1931 and 1935 and who are parents, 34% of the men and 31% of the women had two children; with the generation born 30 years later, the proportions are 46% and 45% (Masson, 2013).

1. Identifying interactions: methodological approach

To analyse the extent to which a child's involvement depends on the involvement of their brother or sister, we must use a statistical model that simultaneously considers the reported caregiving behaviour of both siblings. Four care arrangements are possible: neither sibling is a caregiver, only the elder sibling is a caregiver, only the younger is a caregiver, or both siblings are caregivers.

To isolate endogenous interactions from other factors determining involvement in care, our statistical model[13] assumes that the family care arrangement is a Nash equilibrium. Each sibling adopts what they believe to be the best behavioural option in light of the behaviour of their brother or sister, but also according to their preferences and the situation in which those preferences are expressed. The observed arrangements are therefore assumed to be "stable" in that neither sibling wants, at this stage in the process, to change their behaviour, given the behaviour of the other.

The main value of this approach is that the probability of each sibling's involvement depends directly on the involvement of their brother or sister, once structural factors (the individual characteristics of the child, their parent and their sibship) have been controlled for. This makes it possible to test for the presence and, if applicable, the extent of endogenous interactions. The model also allows us to differentiate behaviours by birth order: the estimated effects are assumed to be different for elder siblings and younger siblings.

Some of the characteristics that determine children's involvement in caregiving may be unobserved and correlated within a sibship. We therefore make the assumption that the random terms summarizing these unobserved characteristics follow a normal bivariate distribution, and estimate the model using maximum likelihood.

2. Choice of structural determinants

We assume that the probability of a child being a caregiver depends partly on the caregiving behaviour of their sibling and partly on their own individual characteristics and those of their parent and the sibship (see description of the sample in Appendix Table A.1).

As well as the child's age,[14] we take into account family and occupational situations liable to affect their availability for care (Le Bihan-Youinou et Martin,

(13) Based on data from the SHARE survey, this model was used by Fontaine et al. (2009) to study family arrangements around dependent elderly parents living without a spouse. In this article we present the model's main characteristics. Readers interested in a more detailed presentation can refer to Fontaine et al. (2009), who discuss the challenges posed by the model's incompleteness (Tamer, 2003). Unlike those authors, we adopt here an exogenous selection rule whereby, in the absence of equilibrium in a given sibship, each of the four care arrangements has a probability equal to its frequency in the sample.

(14) For five of the sibships in our sample, the parent was unable to give the ages of either sibling. In five other cases, they were unable to give the age of the elder child. We replaced these missing values with the mean ages of the elder and younger siblings in the sample.

2006; Peyrache and Ogg, 2017). A caregiver's own children require time and attention; they can be regarded as a competing element in time allocation decisions. The effect of conjugal situation is, in principle, more ambiguous: being in a couple may reduce the caregiver's availability or enable them to shift the care of the dependent elderly parent to their spouse, the parent's child-in-law (negative effect expected). Or the couple may share tasks, freeing up time for the child to be a caregiver. The employment variable distinguishes the economically active (in work or unemployed) from those in other situations (retired, student, homemaker, or other[15]). We assume that individuals apply different rationales of time allocation and that the opportunity cost of caregiving is greater for the economically active. We also isolated those cases where the parent was unable to report on the child's employment status. It was especially important to take individual characteristics into account because our definition of caregivers includes children living with their parent(s); these children have particular family and occupational profiles (Ogg et al., 2015).

For the parent's sociodemographic characteristics, we studied gender, as well as age, to see if this has an effect on the level and type of care provided. Women more often report receiving regular help (Bonnet et al., 2013) and the help they receive is more often of a financial or material nature, whereas men more often report receiving help with daily life tasks (Soullier, 2012; Soullier and Weber, 2011). Although all the parents in our sample were dependent, we isolated the most disabled individuals, defined as those who reported needing help for at least one basic activity of daily living. As the literature has shown the importance of the spouse as main caregiver, with children in second place (Fontaine et al., 2007; Weber, 2011) – a fact also highlighted by our descriptions of family arrangements – we included the parent's conjugal situation among the determinants of care. We also tested the effect of the parent's educational level (by whether or not they had an upper secondary qualification), and monthly income, isolating those who were in the top quartile of our sample (monthly income of at least €1,800). We assume that these variables, which correlate with an individual's social position, influence family elder care norms and modify the likelihood of recourse to paid carers (Weber et al., 2014).

Lastly, we studied the variables relating to the sibship's characteristics. The employment status of the other sibling was included in the determinants, using the distinction between economically active and other situations. Instead of taking the sex of each sibling individually as a factor for involvement, we used the sex composition of the sibship.[16] This variable, rarely used in the literature, allowed us to test for gender-dependent contextual interactions. Knowing that women are more routinely caregivers than men (Bonnet et al.,

(15) "Other" in this case means that the child has been declared disabled. There were few such cases in our sample: 13 elder children and 21 younger.

(16) This meant combining the two dummy variables of the siblings' genders. In commenting on the results we also mention results obtained with a different model which included two separate dummy variables for the gender of each child.

2013; Membrado, 2013), to what extent does being a woman affect caregiving behaviour differently according to the sex of the other sibling? Lastly, we included a dichotomous variable for whether or not the age gap between the two siblings was greater than ten years.

Our estimations used almost all the information on the children provided by the survey. Two variables were not used directly: the children's socioeconomic category (which correlates strongly with employment status) and how far the children lived from the parent's place of residence, which is a potentially endogenous variable. Distance from the parent's home may be a result of the caregiving behaviour rather than the reverse, but it can also be a potential source of collinearity: living in a different region to the parent correlates closely with the child's family situation and employment status and the parent's conjugal situation and level of education.(17) Including that variable might therefore have biased the estimations and have decreased their precision. The robustness tests, however, discuss the results of estimations that include these two explanatory variables.

V. Results

The description of the care arrangements has shown that younger siblings more frequently provide care than their elder siblings. As mentioned above, this gap can be explained by the fact that individual characteristics differ by birth order. The estimation of the model shows that it also stems from differences in the impacts of structural characteristics, especially when a broader definition of care is used, and from the existence of asymmetrical interactions.

1. Differences in behaviour by birth order and type of care

Table 6 shows the results of the model's estimations,(18) with two different definitions of care. In the first estimation we studied the determinants of caregiving by the elder sibling (column 1) and the younger sibling (column 2), considering as caregivers all those either living with the parent or reported as caregivers, regardless of the type of help. For the second estimation (columns 4 and 5), we restricted the status of caregiver to children living with their parent and those reported as giving help with daily life tasks.

(17) Results obtained by estimating a Probit model explaining the probability of a child living in a different region to their parent.

(18) In these estimations, some coefficients were forced to be equal: this is shown in columns 3 and 6. The model was first estimated allowing all coefficients to differ between elder and younger siblings. As a second step, given the small size of our sample (which called for maximum parsimony in the number of parameters to be estimated), we forced the coefficients to be equal between elder and younger siblings if they were not significantly different in the first estimation (at the 20% level).

As regards the effect of individual characteristics, differences between elder and younger siblings emerge when the broader definition of care is applied. Younger siblings' involvement depends significantly on their not having a partner, not having children and not being economically active. Elder children's involvement is affected by age and whether they have a partner. When the definition of care is limited to giving help with daily life tasks, the behaviour of elder and younger children is more similar. Both, in this case, are sensitive to the fact of having children and the fact of being economically active.(19)

The parent's characteristics seem to have similar effects on the behaviour of both siblings. Children are more involved in caring for older parents, those living without a spouse and those without an upper secondary qualification.(20) Elder and younger siblings alike are more often involved when the parent is a mother, but that effect is only significant with the broader definition of care; this suggests that the dependent parent's gender makes a difference mainly for financial help and emotional support. However, with the broader definition of care, younger siblings' behaviour differs from that of elder siblings in two respects. First, the greater the parent's difficulties with ADL, the more frequently they help, whatever the definition of care; second, they help significantly less frequently if the parent reports an income of over €1,800 per month, but as this applies only with the broader definition of care, the distinction probably concerns financial help. Beyond the differences in behaviour by birth order, these results reinforce the impression, already perceptible for individual determinants, that this sharper difference when care is defined more broadly is due to the elder siblings' relatively less flexible behaviour.

As to the variables concerning the sibship, our results shed new light on the gender effect. They show that it is not that women in general are more likely to be caregivers. For both elder siblings and younger siblings, with the narrow definition of care, only a woman with a brother is more frequently a caregiver than any other child of the same birth order, all other things being equal. Taking the broad definition of care, being a woman only has an impact if she is the younger sibling and the elder sibling is a man; in other words, in sibships where the elder is a woman, younger brothers and younger sisters are equally likely to help, all other things being equal. This effect could not have been shown with an analysis treating gender at the individual level, since it concerns the gender of the other sibling.(21)

(19) Situations where the parent could not report on a child's occupational status were, in all cases, associated with a lesser probability of receiving help from that child.

(20) The latter effect could also be interpreted as an indirect measure of the parent's need for care, assuming that a lower level of education is associated with lesser recourse to paid care.

(21) In a model with separate dummy variables for the sex of each child, being a woman only significantly increases the probability of being a caregiver for those who are elder siblings. This applies with both broad and narrow definitions of care.

Elder and younger siblings are also both insensitive to whether their sibling is economically active or not, whichever definition of care is used. A wide age gap between the siblings significantly reduces the probability of the younger sibling providing care, whichever definition of care is used; for the elder, a wide age gap increases the likelihood of being a caregiver, but only with the narrow definition of care. This type of arrangement may reflect particular situations where the elder child started helping in the home early on (helping their mother with housework and taking care of their younger sibling), and continues to help in a new way (caring for the parent and protecting the younger sibling). Elder children much older than their siblings may also behave like only children, and thus be routinely designated as caregivers (Weber, 2011).

Table 6. Determinants of care provided to a dependent elderly parent by elder and younger children in sibships of two

	Child reported as a caregiver by the parent (all types of aid) or co-resident with parent			Child reported as a caregiver by the parent for daily life tasks or co-resident with parent		
	Elder	Younger	Equality of coefficients	Elder	Younger	Equality of coefficients
Constant	−0.364 (0.563)	−0.364 (0.563)	Yes	−0.464 (0.605)	−0.464 (0.605)	Yes
Child's characteristics						
Age	−0.036*** (0.011)	−0.010 (0.010)	No	−0.032*** (0.011)	−0.016 (0.010)	No
Has a partner *Ref.*: does not have a partner	−0.492*** (0.124)	−0.490*** (0.124)	Yes	−0.733*** (0.126)	−0.733*** (0.126)	Yes
Has children *Ref.*: has no children	−0.174 (0.188)	−0.550*** (0.174)	No	−0.347** (0.140)	−0.347** (0.140)	Yes
Active (in work or unemployed)	−0.177 (0.158)	−0.641*** (0.158)	No	−0.308* (0.160)	−0.823*** (0.159)	No
Parent does not know child's occupation *Ref.*: retired, student, homemaker or other	−1.434*** (0.376)	−1.434*** (0.376)	Yes	−2.027*** (0.469)	−2.027*** (0.469)	Yes
Parent's characteristics						
Age	0.026*** (0.010)	0.026*** (0.010)	Yes	0.026** (0.011)	0.026** (0.011)	Yes
Woman *Ref.*: man	0.225** (0.116)	0.225** (0.116)	Yes	0.159 (0.128)	0.159 (0.128)	Yes
Has ADL limitations *Ref.*: has only IADL limitations	−0.073 (0.165)	0.368** (0.151)	No	0.104 (0.178)	0.468*** (0.157)	No
Has upper secondary qualification *Ref.*: does not have upper secondary qualification	−0.519*** (0.191)	−0.519*** (0.191)	Yes	−0.707*** (0.219)	−0.707*** (0.219)	Yes
Monthly income ≥ €1,800 *Ref.*: monthly income < €1,800	−0.116 (0.159)	−0.155*** (0.149)	No	−0.123 (0.114)	−0.123 (0.114)	Yes
Living without spouse *Ref.*: living with spouse	0.394*** (0.125)	0.394*** (0.125)	Yes	0.271** (0.124)	0.271** (0.124)	Yes

Table 6 (cont'd). Determinants of care provided to a dependent elderly parent by elder and younger children in sibships of two

	Child reported as a caregiver by the parent (all types of aid) or co-resident with parent			Child reported as a caregiver by the parent for daily life tasks or co-resident with parent		
	Elder	Younger	Equality of coefficients	Elder	Younger	Equality of coefficients
Sibship characteristics						
Other child active *Ref.*: other child retired. student. homemaker or other. or parent does not know other child's occupation	−0.132 (0.129)	−0.132 (0.129)	Yes	−0.076 (0.138)	−0.076 (0.138)	Yes
Ego = woman. alter = woman *Ref.*: ego = woman. alter = man	−0.399** (0.175)	−0.215 (0.176)	No	−0.244* (0.138)	−0.244* (0.138)	Yes
Ego = man. alter = man *Ref.*: ego = woman. alter = man	−0.459*** (0.144)	−0.459*** (0.144)	Yes	−0.481*** (0.161)	−0.481*** (0.161)	Yes
Ego = man. alter = woman *Ref.*: ego = woman. alter = man	−0.700*** (0.190)	−0.122 (0.199)	No	−0.402*** (0.145)	−0.402*** (0.145)	Yes
Age gap between elder and younger > 10 yrs *Ref.*: age gap < 10 yrs	0.377 (0.236)	−0.720*** (0.265)	No	0.433* (0.242)	−0.514* (0.280)	No
Interactions						
Other child is involved[(a)]	1.197*** (0.360)	−0.476 (0.524)	No	1.004*** (0.367)	−0.373 (0.428)	No
Correlation coefficient between the residuals	−0.090 (0.361)			−0.015 (0.322)		
Log likelihood	−486.795			−403.442		
Number of observations	479			479		

Significance: * p < 0.10; ** p < 0.05; *** p < 0.01.
Notes: Standard deviations in brackets. In the estimates shown in columns 1 and 2, a child is a caregiver if he/she is reported as such by the parent (all types of help) or if he/she lives with the parent. In the estimates shown in columns 4 and 5, a child is a caregiver if he/she is reported as such by the parent and helps with daily life tasks, or if he/she lives with the parent. Columns 3 and 6 show which coefficients have been forced to be equal in the estimation process, i.e. coefficients for which the difference between the elder and younger child's coefficients in the unconstrained model were not significant at the 20% level.
(a) As the likelihood function was not differentiable at the point where the interaction coefficients were simultaneously equal to 0, it was necessary to run a special significance test, which is formally described in Fontaine et al. (2009).
Sample: 492 dependent older adults living in ordinary households and having two adult children.
Source: Handicap–Santé survey, households section (INSEE–DREES, 2008).

In terms of endogenous interactions, we see an asymmetry of behaviours, whether care is defined as helping with daily life tasks or also includes financial help and emotional support. All other things being equal, elder siblings are significantly more frequently involved in care if the younger one is a caregiver; conversely, younger siblings tend not to adjust their behaviour according to the elder's involvement, and are perhaps less likely to help if their elder sibling is a caregiver (negative coefficient, but not significantly different from zero).

2. Alternative specifications

To check the robustness of the results presented above, several alternative estimations were made using the broader definition of care.(22)

The estimation of a model that included distance from the parent's home, separating out those children living in a different region to their parent, gave the classic results found in the literature (see e.g. Mulder and van der Meer, 2009). Living outside the region reduces the probability of helping the parent. The results of the previous section are robust to the inclusion of the distance variable and the endogenous interaction coefficient becomes significant for the younger child.(23) The model was also estimated with a variable for the parent's living environment – whether "living in a rural area" or not. Living in a rural area did not significantly affect the probability of receiving care from the children, and the results for the other determinants are robust.

We then included indicators of child's occupational category, based on INSEE's list (six categories). Elder children who are manual workers or in intermediate occupations are more likely to be caregivers than those in higher-level occupations, as are younger children who are farmers. To facilitate interpretation, we then tested the effect of a difference between the two siblings' occupational categories, isolating cases where one of them is in one of the top three INSEE categories (farmers; artisans, traders and small business owners; managers and higher-level occupations) and the other is in one of the other categories (technicians and other intermediate occupations; clerical workers; manual workers). When the elder is in one of the top classes and the younger in one of the others, the probability of providing care is lower for both siblings. In the converse case, there is no impact on the probability of caregiving.

Other variables were introduced that did not seem to alter the family balance observed so far. When the parent is not living with a spouse, there may be a sharing of the care given to separated or divorced parents, particularly if the second parent is also dependent. The initial model was therefore estimated with an indicator for the parent's marital status, distinguishing the divorced and separated from the widowed and unmarried. This estimation did not show that marital status has a significant effect on the care received.

Last, to take into account formal care and care from other members of the dependent person's close circle, we estimated the model with, first, an indicator isolating those respondents who received formal care and, second, an indicator isolating those who received help from another member of the close circle (friend, neighbour or family member other than spouse or children). These

(22) For each alternative specification we reiterated the procedure for selecting coefficient equality constraints.

(23) The younger sibling's interaction coefficient, previously non-significant, now becomes significantly different from zero at the 5% level.

estimations suggest that neither formal care nor other informal care have any impact on the help provided by the children, whether elder or younger. In all these models, the results for the other explanatory variables remain robust to the inclusion of the added indicators.

Conclusion

Our results shed light on certain mechanisms shaping a family's organization of care for a dependent elderly parent. They confirm first of all that a child's involvement in care is sensitive to family arrangement. The presence of a spouse living with the dependent parent reduces the children's involvement and alters the sensitivity of the children's involvement to the size of the sibship. Second, birth order affects whether a child will be a caregiver or not. In sibships of two, the younger is more often reported as providing care, especially as sole caregiver. Analysis of sibships of two, all other things being equal, distinguished several explanations for these differences. First, caregiving depends on individual characteristics that are differently distributed between elder and younger siblings. Second, the determining characteristics differ by birth order. The behaviour of elder children seems less sensitive to individual determinants than that of younger children. Younger children would appear to arbitrate between the costs and benefits of caregiving, adjusting their help according to their personal constraints (family status, employment situation) or the parent's degree of need. Elder children seem to adjust to their younger sibling's behaviour: they are more likely to help if their younger sibling does, whereas adjustment by younger children is non-significant. However, their behaviours differ less if one looks only at help with daily life tasks, for which the key difference between elder and younger children is the asymmetry in endogenous interactions, i.e. the difference between the siblings in their adjustment to the behaviour of the other. The analysis also shows the importance of the sibship's gender composition: being a woman rather than a man is only significant if one has a brother, and having a brother rather than a sister is only significant if one is a woman.

These first results, based on French data, call for further research. In the first place, children were defined as caregivers on the basis of the dependent parent's reports. This is not a neutral definition; reporting may be biased and it is hard to estimate the direction and extent of such bias. It would also be useful to clarify the mechanisms underlying the differences in caregiving behaviour by birth order: do they reflect personal preferences on the children's part or are parents more likely to ask younger children for help? To examine that question, data on requests expressed or frequency of contact with one or other child would be needed. The question of how long the parent has been dependent and receiving care from their children could also be studied, to see whether behaviours differ according to the history of the care arrangement.

Lastly, our dichotomous formalization of caregiving behaviour (caregiver versus non-caregiver) is fairly crude. It says nothing about the pattern of help provided, particularly in terms of time allocation. Knowing that both children are caregivers tells us nothing about how they organize the care or share tasks and care time.

Our results are similar to those found for Europe from the SHARE survey (Fontaine et al., 2009), although those findings were based on a slightly different sample (only parents living alone) and seem more nuanced. These disparities may be due to differences in the study population (French context versus a variety of European contexts) or in the definition of care adopted (in SHARE, people did not necessarily have to provide assistance on a regular basis or in response to activity limitations to be designated as caregivers). However, for both France and Europe, interactions between elder and younger children have the same asymmetry, and operate in the same direction.

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Appendix

Table A.1. Description of the estimation sample

		All configurations (479 sibships)	None is a caregiver (250)	Only elder is a caregiver (60)	Only younger is a caregiver (93)	Both siblings are caregivers (76)
Child's characteristics						
Child's age (years) [(a)]	Elder	52	50	53	55	53
	Younger	47	45	45	50	48
Family situation						
with a spouse (%)	Elder	72 (344)	76 (191)	47 (28)	80 (75)	66 (50)
	Younger	69 (329)	77 (193)	62 (37)	57 (53)	60 (46)
has children (%)	Elder	80 (385)	82 (204)	70 (42)	82 (76)	83 (63)
	Younger	76 (365)	82 (206)	70 (42)	73 (68)	64 (49)
Employment status						
active (in work or unemployed) (%)	Elder	68 (323)	76 (205)	51 (28)	55 (49)	61 (41)
	Younger	76 (363)	85 (229)	65 (36)	60 (53)	67 (45)
parent does not know (%)	Elder	3 (16)	3 (7)	7 (4)	6 (5)	0 (0)
	Younger	2 (10)	3 (7)	4 (2)	1 (1)	0 (0)
Parent's characteristics						
Parent's age (years)		77	75	80	80	79
Woman (%)		69 (31)	63 (157)	70 (42)	74 (69)	83 (63)
Parent reports inability to perform at least one activity of daily living (ADL) on their own (%)		27 (130)	23 (58)	22 (13)	33 (31)	37 (28)
Education: has upper secondary qualification or higher (%)		11 (54)	16 (40)	3 (2)	8 (7)	7 (5)
Monthly income ≥ €1,800 (%)		38 (183)	45 (113)	43 (26)	33 (31)	17 (13)
Sibship characteristics						
Elder woman, younger man (%)		26 (124)	20 (51)	47 (28)	23 (21)	32 (24)
Elder man, younger woman (%)		27 (130)	27 (68)	15 (9)	38 (35)	24 (18)
Elder woman, younger woman (%)		26 (126)	27 (67)	23 (14)	25 (23)	29 (22)
Age gap between elder and younger ≥ 10 yrs		9 (45)	7 (18)	22 (13)	9 (8)	8 (6)

Significance: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.
Notes: Standard deviations in brackets. In the estimates shown in columns 1 and 2, a child is a caregiver if he/she is reported as such by the parent (all types of help) or if he/she lives with the parent. In the estimates shown in columns 4 and 5, a child is a caregiver if he/she is reported as such by the parent and helps with daily life tasks, or if he/she lives with the parent. Columns 3 and 6 show which coefficients have been forced to be equal in the estimation process, i.e. coefficients for which the difference between the elder and younger child's coefficients in the unconstrained model were not significant at the 20% level.
(a) As the likelihood function was not differentiable at the point where the interaction coefficients were simultaneously equal to 0, it was necessary to run a special significance test, which is formally described in Fontaine et al. (2009).
Sample: 492 dependent older adults living in ordinary households and having two adult children.
Source: Handicap–Santé survey, households section (INSEE–DREES, 2008).

References

Beliard Aude, Billaud Solène, Perrin-Heredia Ana, Weber Florence, 2012, "Circulation de l'enquêteur, relations familiales et aide informelle: post-enquête qualitative sur les situations de handicap, la santé et l'aide aux personnes en situation de handicap", DREES-CNSA, 226 p.

Bonnet Carole, Cambois Emmanuelle, Cases Chantal, Gaymu Joëlle, 2013, "La dépendance: quelles différences entre les hommes et les femmes ?", *Gérontologie et société*, 145(2), pp. 55-66.

Byrne David, Goeree Michelle S., Hiedemann Bridget, Stern Steven, 2009, "Formal home health care, informal care, and family decision making", *International Economic Review*, 50(4), pp. 1205-1242.

Checkovich Tennille J., Stern Steven, 2002, "Shared caregiving responsibilities of adult siblings with elderly parents", *The Journal of Human Resources*, 37(3), p. 441-478.

Colombo Francesca, Llena-Nozal Ana, Mercier Jérôme, Tjadens Frits, 2011, *Help Wanted? Providing and Paying for Long-Term Care*, Paris, OECD Publishing, 336 p.

Désesquelles Aline, Brouard Nicolas, 2003, "The family networks of people aged 60 and over living at home or in an institution", *Population, English Edition,* 58(2), pp. 181-206.

Duée Michel, Rebillard Cyril, 2006, "La dépendance des personnes âgées: une projection en 2040", *Données sociales: La société française*, 7, pp. 613-619.

Engers Maxim, Stern Steven, 2002, "Long-term care and family bargaining", *International Economic Review*, 43(1), pp. 73-114.

Fontaine Roméo, 2011, "Le soutien familial aux personnes âgées dépendantes. Analyses microéconométriques des comportements individuels et familiaux de prise en charge", PhD thesis, Paris Dauphine, 244 p.

Fontaine Roméo, Gramain Agnès, Wittwer Jérôme, 2007, "Les configurations d'aide familiale mobilisées autour des personnes âgées dépendantes en Europe", *Économie et statistique*, 403(1), pp. 9-115.

Fontaine Roméo, Gramain Agnès, Wittwer Jérôme, 2009, "Providing care for an elderly parent: Interactions among siblings?", *Health Economics*, 18(9), pp. 1011-1029.

Hiedemann Bridget, Stern Steven, 1999, "Strategic play among family members when making long-term care decisions", *Journal of Economic Behavior and Organization*, 40(1), pp. 29-57.

Le Bihan-Youinou Blanche, Martin Claude, 2006, "Travailler et prendre soin d'un parent âgé dépendant", *Travail, genre et sociétés*, 16(2), pp. 77-96.

Manski Charles F., 2000, "Economic analysis of social interactions", *The Journal of Economic Perspectives*, 14(3), pp. 115-136.

Masson Luc, 2013, "Avez-vous eu des enfants ? Si oui, combien ?", in Beffy Magali and Guedj Hélène (eds.), *France, portrait social*, Paris, INSEE, pp. 93-109.

MEMBRADO Monique, 2013, "Le genre et le vieillissement: regard sur la littérature", *Recherches féministes*, 26(2), pp. 5-24.

MULDER Clara H., VAN DER MEER Marieke J., 2009, "Geographical distances and support from family members", *Population, Space and Place*, 15(4), pp. 381-399.

OGG Jim, RENAUT Sylvie, TRABUT Loïc, 2015, "La corésidence familiale entre générations adultes: un soutien réciproque", *Retraite et société*, 1(70), pp. 105-125.

PENNEC Simone, 2007, "Comment les enfants s'occupent-ils de leurs parents ? Pratiques et logiques filiales", in Dreyer Pascal, Ennuyer Bernard (eds.), *Quand nos parents vieillissent: prendre soin d'un parent* âgé, Paris, Autrement, Mutations, pp. 105-121.

PEYRACHE Malorie, OGG Jim, 2017, "Concilier vie professionnelle et aide informelle à un parent âgé. Un défi des 50-64 ans en Europe", *Revue européenne des sciences sociales*, 55(1), pp. 97-125.

PEZZIN Liliana E., STEINBERG SCHONE Barbara, 1999, "Intergenerational household formation, female labor supply and informal caregiving: A bargaining approach", *The Journal of Human Resources*, 34(3), pp. 475-503.

PEZZIN Liliana E., POLLAK Robert A., STEINBERG SCHONE Barbara, 2007, "Efficiency in family bargaining: Living arrangements and caregiving decisions of adult children and disabled elderly parents", *CESifo Economic Studies*, 53(1), pp. 69-96.

SLOAN Forder A., PICONE Gabriel, HOERGER Thomas J., 1997, "The supply of children's time to disabled elderly parents", *Economic Inquiry*, 35(2), pp. 295-308.

SOULLIER Noémie, 2012, "Aider un proche âgé à domicile: la charge ressentie", Paris, DREES, *Études et résultats*, 799, 8 pp.

SOULLIER Noémie, WEBER Amandine, 2011, "L'implication de l'entourage et des professionnels auprès des personnes âgées à domicile", Paris, DREES, *Études et résultats*, 771, 8 pp.

STERN Steven, 1994, "Two dynamic discrete choice estimation problems and simulation method solutions", *The Review of Economics and Statistics*, 76(4), pp. 695-702.

TAMER Elie, 2003, "Incomplete simultaneous discrete response model with multiple equilibria", *The Review of Economic Studies*, 70(1), pp. 147-165.

TENAND Marianne, 2016, "La barrière des 60 ans dans les dispositifs de compensation des incapacités: quels effets sur les aides reçues à domicile par les populations handicapée et dépendante ?", *Revue française des affaires sociales*, 4, pp. 129-155.

WEBER Florence, 2011, *Handicap et dépendance: drames humains, enjeux politiques*, Paris, Rue d'Ulm, Collection du Cepremap, 76 p.

WEBER Florence, TRABUT Loïc, BILLAUD Solène (eds.), 2014, *Le salaire de la confiance: l'aide à domicile aujourd'hui*, Paris, Rue d'Ulm, 368 p.

Quitterie Roquebert, Roméo Fontaine, Agnès Gramain • **Caring for a Dependent Elderly Parent: Care Arrangements and Sibling Interactions in France**

Using data from the Household section of the Handicap-Santé (Disability and health) survey, (INSEE-DREES, 2008), this article studies kin support arrangements for dependent older adults in France. The first part is descriptive, showing how the care provided by adult children is affected by the parent's conjugal situation, sibship size and birth order. The second part analyses families with two adult children and shows that the observed differences in care involvement by birth order are due to three factors: differences in individual characteristics between elder and younger siblings, differences in the impacts of these characteristics on the caregiving decision, and a difference in the adjustment of one sibling to the behaviour of the other (endogenous interactions). The impact of family characteristics seems fairly similar for elder and younger siblings, especially the strong tendency for the woman to be the caregiver if her sibling is a man, but the behaviour of the younger children reflects a compromise between the costs and benefits of caregiving. Defining aid more narrowly as help with daily life tasks, just one major explanation of the differences remains: with a given set of individual and family characteristics, there is an asymmetry in adjustment to the caregiving behaviour of the other child.

Quitterie Roquebert, Roméo Fontaine, Agnès Gramain • **Aider un parent âgé dépendant. Configurations d'aide et interactions dans les fratries en France**

À partir de l'enquête Handicap-Santé, volet Ménages (Insee-Drees, 2008), nous étudions les configurations d'aide familiale autour d'un parent âgé et dépendant en France. Une première étape descriptive montre que l'aide apportée par les enfants est affectée par le statut conjugal du parent, la taille de la fratrie et le rang dans la fratrie. L'analyse se concentre ensuite sur les familles de 2 enfants et montre que les écarts de mobilisation observés selon le rang découlent de trois sources : les différences de caractéristiques individuelles entre aînés et cadets, l'impact variable de ces caractéristiques sur la décision d'aide, et enfin une différence dans l'ajustement des uns au comportement des autres (interactions endogènes). L'impact des caractéristiques familiales apparaît en effet relativement similaire pour les aînés et les cadets –en particulier la forte assignation au rôle d'aidant des femmes avec un frère–, mais le comportement des cadets fait apparaître en outre un arbitrage entre coûts et utilité de l'aide. Avec une définition de l'aide ciblée sur les tâches de la vie quotidienne, une seule explication majeure des différences demeure : l'asymétrie dans l'ajustement au comportement de l'autre enfant, à caractéristiques individuelles et familiales données.

Quitterie Roquebert, Roméo Fontaine, Agnès Gramain • **Ayudar a los padres mayores dependientes. Configuraciones de la ayuda e interacciones entre los hijos en Francia**

A partir de la encuesta Handicap-Santé, en su componente Ménages (Insee-Drees, 2008), analizamos las configuraciones que presenta en Francia la ayuda familiar a los padres mayores dependientes. Una primera etapa descriptiva muestra que la ayuda aportada por los hijos está influida por el estatuto matrimonial del que recibe la ayuda, el número de hijos y el rango en la hermandad. El análisis se concentra después en las familias de dos hijos y se observa entonces que las diferencias de movilización según el rango resultan de tres fuentes: las diferencias en las características individuales entre primogénitos y cadetes, el impacto diferente de estas características sobre la decisión de ayudar, y en fin una diferencia en el ajuste de unos al comportamiento de los otros (interacciones endógenas). El impacto de las características familiares aparece en efecto relativamente similar en los primogénitos y en los cadetes – en particular la fuerte asignación de la hija al papel de ayudante cuando el otro hijo es un varón –, pero el comportamiento de los cadetes revela además un arbitraje entre coste y utilidad de la ayuda. Cuando se restringe la definición de ayuda a las tareas domésticas de la vida cotidiana, una sola explicación principal de las diferencias aparece: la asimetría en el ajustamiento al comportamiento del otro hijo, una vez fijadas las características individuales y familiares.

Keywords: dependent older adults, informal care, social interactions, Handicap-Santé disability survey, SHARE, France

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