An integrative analysis of sibling influences on adult children's care-giving for parents

An integrative analysis of sibling influences on adult children's caregiving for parents

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Abstract

The extent to which, and the reasons why, children help to care for their parents are examined in an extensive range of literature. Although care for parents essentially takes place in parent-child dyads, many of these studies acknowledge that the amount of care a child gives is generally the outcome of collective decisions in multiple-child families. However, to our knowledge, no research in Europe enhances our understanding on how sibling characteristics influence an individual child's caregiving. Using data for 14 European countries from the Survey of Health, Ageing and Retirement in Europe (SHARE), the present study relates pre-caregiving sibling characteristics to children's subsequent start of giving care. This longitudinal approach allows to correct for the endogenous nature of time-changing predictors. The analysis demonstrates that daughters start to care more often when they have brothers instead of sisters. This pattern of gendered intergenerational care particularly applies to southern European countries. We also observe that both pre-caregiving parent-siblings frequency of contact and geographic distances predict children's caregiving transition strongly. Children being closer to their parents than siblings in terms of contact and proximity have higher odds of caretaking. Finally, being the only child without a job enhances the start of caregiving as well. The results suggest that sibling characteristics are an important factor in explaining intergenerational care differences between children in Europe.

Keywords

Intergenerational solidarity – Caregiving – Siblings – Gender composition – Family

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Introduction

As European societies are ageing, larger numbers of older people experience functional limitations. Family members, especially partners and children, contribute strongly in caring for older dependent persons. In the light of progressing population ageing and austerity in professional care, European welfare states increasingly rely on unpaid elderly care (Broese van Groenou and De Boer 2016). At the same time, demographic shifts and societal developments - such as shrinking family sizes, increased female labor force participation and higher retirement ages - may put pressure on the future availability of informal care (Agree and Glaser 2009). Therefore, numerous papers have studied when or why relatives take up a caregiver role, with particular attention to the care provision of adult children. Although caregiving for parents essentially takes place in parent-child dyads, the amount of care children provide generally results from interdependent decisions in multiple-child families (Allan 1977, Checkovich and Stern 2002, Finch and Mason 1993). As such, parent-child care exchanges are embedded in the family and likely to be affected by siblings (Grigoryeva 2017, Henretta, Soldo and Van Voorhis 2011, Szinovacz and Davey 2013; Tolkacheva, Broese van Groenou and van Tilburg 2014).

A prominent component of the family context is gender composition. Care for parents is still regarded as daughters' work (Haberkern, Schmid and Szydlik 2015, Matthews 2002, Verbakel *et al.* 2017). The primacy of women in elderly care is particularly reflected when care for parents is allocated within the family. Sons frequently shirk from parent care, while their present sister(s) often shoulder(s) the care burden instead (Grigoryeva 2017). Other individual characteristics (e.g. geographic proximity or employment), shown to be most conducive to caregiving, are hardly considered at the family level. However, not only a child's own propensity to care, but also the prospects of his or her siblings could adjust the care an adult child provides. The present study aims to address this gap by examining how siblings affect the dyadic parent-child care exchange in Europe. As a result, we contribute to existing research investigating how care arrangements are shaped within the family context (Szinovacz and Davey 2013, Tolkacheva, Broese van Groenou and van Tilburg 2010). We elaborate on individual predictors of caregiving by assessing their influence on a child's care provision at the sibling level. A major strength of this research paper is the use of the rich Survey of Health, Ageing and Retirement in Europe (SHARE) panel data to deal with endogeneity of the sibling predictors. Our longitudinal approach allows to test the impact of sibling characteristics prior to care provision, taking into account the temporal ordering of the transition to caregiving (Leopold, Raab and Engelhardt 2014, Pillemer and Suitor 2013). This avoids reversed causality as a child's caregiving may forge changes among their siblings (e.g. start to work when a brother or sister takes the care burden).

In addition, this study seeks to explore how sibling characteristics differently affect children's care for parents across Europe. As pointed out by Haberkern, Schmid and Szydlik (2015), gender inequality in intergenerational care is highest in countries with a low provision of professional home care services, a traditional division of unpaid household labour and a strong emphasis on families' care responsibilities. Furthermore, according to recent inquiry, children caring for dependent parents are particularly driven by cultural norms in countries where strong family ties prevail (Klimaviciute *et al.* 2017). This suggests that daughters may feel more obliged to look after their parents in these countries, irrespective of their siblings' care prospects.

The empirical analysis draws on recent SHARE data from wave 5 and 6 (2013-2015). SHARE includes rich information on both care receiving of parents and their children's characteristics. To examine the associations between sibling characteristics and a child's caregiving, 79,020 parent-child dyads are considered in a logistic regression analysis of the transition to care for a parent. The consecutive waves

are used to correct for endogeneity as we relate prior sibling characteristics (wave 5) to the start of giving care in wave 6.

Theory

Life course and family systems theory provide the guiding principles of this study, both highlighting the interdependence of family members (Bengtson and Allen 1993, Cox and Paley 1997, Szinovacz and Davey, 2013). A priori we consider the lives of children and their parents interrelated as we examine the care children give to their parents. In addition, we expect that the caregiving of children is influenced by the availability, characteristics and caregiving of their siblings. Informal care for parents often occurs with siblings involving together (Tolkacheva, Broese van Groenou and van Tilburg 2014). Dividing care between siblings lowers the individual caregiving burden (Tolkacheva *et al.* 2011). By a logical progression, children with more siblings are likely to give less parent care than children in smaller families (Bonsang 2007). At the same time, children may consider a trade-off between their own and their siblings' caregiving prospects (Silverstein, Conroy and Gans 2008). Not only does one life domain relate to another at the individual level (e.g. one's employment and caregiving), but those life domains could also be linked between different siblings (e.g. siblings' employment and one's caregiving). A child's decision to provide care may take siblings' care opportunities and constraints into account, as well as normative and affective commitments (Finch and Mason 1993). The present study therefore focuses on the role of individual care predictors aggregated to the sibling level. We distinguish between three groups of caregiving determinants: i) gender and gender roles, ii) the costs of caregiving and iii) parent-child commitment. Those factors will be discussed in the following paragraphs. Subsequently, we briefly address cross-country variation.

Gender and gender roles

The gender division of informal support for parents has been well documented, particularly that intensive caregiving is unfairly weighted against women in Europe (Haberkern, Schmid and Szydlik 2015; Verbakel *et al.* 2017). In the literature, the distinctive gender roles in informal caregiving are explained from different theoretical perspectives (Finley 1989, Lachance-Grzela and Bouchard 2010). However, most studies underline the importance of normative factors concerning the primacy of daughters in care for the elderly. The daughter's role of principal caregiver cannot be traced to different resources and constraints of men and women (Haberkern, Schmid and Szydlik 2015). As reported by Silverstein, Gans and Yang (2006), normative beliefs are important for the care provision of daughters, which is consistent with traditional gender ideology regarding family labor (Cunningham 2001a, Cunningham 2001b). Gendered care attitudes prescribe that daughters are more responsive to personal care needs of family members, while sons are expected to perform practical and paid tasks (Haberkern, Schmid and Szydlik 2015). A variant of this perspective points at gender construction. According to this view, family care is crucial to the female role (Knudsen and Wærness 2008). Their unpaid work is an expression of the female gender identity, whereas men resist performing more household labor to defend and reinforce the male identity (Erickson 2005). Gender inequality can also be linked to the preferences of care recipients. Mothers are often closer and more intimate with their daughters than sons. Since intimacy is of particular importance for the task of caregiving, mothers generally prefer receiving care from their daughters (Pillemer and Suitor 2006). Given that most elders in need of care are women, the mother-daughter tie contributes to the observed gender differences in intergenerational care.

As mentioned earlier, family members potentially reduce the intergenerational care burden since siblings often take up a joint care responsibility. American research however suggests that also a family's gender composition matters. The number of sisters available to care appears to influence children's caregiving more compared to the number of brothers (Szinovacz and Davey 2013, Tolkacheva, Broese van Groenou and van Tilburg 2010, Wolf, Freedman and Soldo 1997). This corresponds with gendered family care as sisters reduce the care efforts of other children, especially brothers (Grigoryeva 2017). Since women are generally seen as "natural" caregivers, brothers may easily find justification to refrain from care tasks. Daughters providing no or only a minimum of care, however, feel more often guilty and experience difficulties to legitimize disengagement (Ingersoll-Dayton, *et al.* 2003). In sum, we expect that the gender division of caregiving for parents is reflected at the family level. The first hypothesis hence reads:

1. Irrespective of both individual and siblings' care opportunities, a) daughters are more likely to give care to their parents than sons, b) especially in families where sons are prevalent.

The cost of caregiving: geographic proximity, family demands and employment

Besides normative considerations of gendered care, research on filial caregiving generally relies on rational choice and exchange theory. This strand of the literature highlights the importance of the "price" of informal care services, mostly translating into the opportunity costs of children's time to care (Bianchi *et al.* 2006, Finch and Mason 1993, Silverstein *et al.* 2002). The present study considers barriers to interact with parents (geographic distance) and competing demands or obligations (a child's own family life and employment), both increasing the costs of caregiving. However, a child's decision to help his or her parents is not reducible to an individual cost calculation. Instead of pursuing a costly care activity, children may count on siblings as an alternative source of support (Silverstein, Conroy and Gans 2008). Hence, individual children's care opportunities interact with those of siblings, emphasizing the relativity of his or her own caregiving prospects (Tolkacheva, Broese van Groenou and van Tilburg 2010, Tolkacheva, Broese van Groenou and van Tilburg 2014). In accordance with rational choice theory, children are assumed to allocate care for parents so that the care burden is distributed efficiently between siblings. We expect that children encountering the lowest care costs are most likely to provide assistance to their parents.

A well-documented determinant of care for parents is *geographic proximity*. A closer proximity facilitates contact between family members and increases the possibility to exchange care (Bonsang 2007, Hank 2007, Joseph and Hallman 1998, Leopold, Raab and Engelhardt 2014, Pillemer and Suitor 2013). Shorter distances between children and parents reduce travel costs and increase time-efficiency for care providers, particularly for recurrent and demanding care. A few studies have considered the distance of siblings to parents as a predictor of caregiving, with Matthews (2002) and Leopold, Raab and Engelhardt (2014) suggesting more caregiving among children with closer parent-child distance compared to siblings. Tolkacheva, Broese van Groenou and van Tilburg (2010), examining average travel time between siblings and a parent, find a limited association between siblings' proximity and individual care intensity. However, geographic location is not necessarily exogenous to caregiving. Stern (1995) demonstrates that family members also move to closer distances because of the decision to start caring, introducing a reverse relationship between care and proximity (Pettersson and Malmberg 2009, Smits, Van Gaalen and Mulder 2010). A longitudinal research design addressing the impact of proximity prior to the onset of caregiving allows for an adequate assessment of siblings' proximity effects.

Adult children's lives are not exclusively linked to their parents and siblings. Children also occupy other adult roles, such as being someone's partner or parent. Competing *family demands* are thought to

limit children's availability to provide care for their parents. First, studies show that partnered children are less often caregivers (Henz 2006, Haberkern & Szydlik 2010, Silverstein, Conroy and Gans 2008). A study relating the proportion of siblings with partners to children's individual caregiving efforts corroborates this result (Tolkacheva, Broese van Groenou and van Tilburg 2010). Second, parenting children may have less time available to provide care for a parent (Henz 2006, Igel *et al.* 2009). In correspondence, Henretta, Soldo and Van Voorhis (2011) reveal that a higher share of parenting siblings increases the individual likelihood of taking up care.

A third evident cost-related predictor is *employment*. The connection between employment and care for parents is a complex one. The high demands of both care and employment diminish the willingness and effective hours of caregiving among workers (Bonsang 2007; Carmichael, Charles and Hulme 2010). Working kin has less time available to care. In addition, children with high earnings are reluctant to shoulder care tasks since it might jeopardize future employment and income prospects (Carmichael, Charles and Hulme 2010). Indeed, research suggests that caregivers frequently cut back in hours of paid work or leave the labor force to meet the needs of care recipients (Bolin, Lindgren and Lundborg 2008, Van Houtven, Coe and Skira 2013). This confirms a two-way causality between caring and employment status (Leopold, Raab and Engelhardt 2014). Again, research addressing the role of siblings' employment in children's care provision requires longitudinal analysis to avoid spurious interpretations.

Taken together, we anticipate that care for parents is frequently taken on by children having siblings with limited opportunities to care. This leads to the second hypothesis:

2. An individual child is more likely to provide care if his or her siblings encounter higher caregiving costs.

Parent-child commitment

Finally, we introduce *contact frequency* between parents and their children as an explanatory variable of children's caregiving. Regularity of parent-child contact is often regarded as a measure of relationship quality and emotional closeness (Leopold, Raab and Engelhardt 2014). As pointed out by Pillemer and Suitor (2006), parents prefer to receive care from children that are emotionally close. In this respect, previous work by Tolkacheva, Broese van Groenou and van Tilburg (2010) also demonstrates that children take up more care when siblings have emotionally poorer relationships with their parents. Besides feelings of closeness, children having frequent contact might be more aware of parents' care needs or preferences as well, which, in turn, makes them prone to become parents' expected caregiver (Leopold, Raab and Engelhardt 2014, Pillemer and Suitor 2013). In addition, parent-child contact may also enhance or reflect care-promoting factors such as shared values and familialism (Pillemer and Suitor 2006, Silverstein, Gans and Yang 2006). Most studies have considered the association between contact and care in cross-section, with the caveat that care depends on regular interpersonal contact. Therefore, it is clear that contact frequency and emotional ties are reinforced through caregiving. To control for this, research should pay attention to the temporal ordering of the contact-care nexus. All in all, the third hypothesis is as follows:

3. An individual child is more likely to provide care if his or her siblings are less in contact with their parents.

Cross-country variation

Across Europe the organization of care for the elderly is subject to substantial heterogeneity. Comparative studies show a clear north-south gradient with intensive informal care prevailing in southern Europe and only a limited prevalence of demanding intergenerational care in the north. Western and central European

countries are in an intermediate position (Brandt 2013, Brandt, Haberkern and Szydlik 2009). These country differences are largely attributable to varying welfare state regimes and cultural contexts (Verbakel 2018). Recent studies find that elderly care in southern European countries is predominantly driven by family obligations, while countries with weaker family ties rely more on the supply of state care provisions (Klimaviciute *et al.* 2017, Viazzo 2010). Here, informal care seems voluntary and is more often perceived as a joyful task (Brandt 2013), suggesting that care for parents is carried out by children with favorable caregiving opportunities and less imposed by normative expectations. At the same time, it appears that gender differences in intergenerational care are congruent with the prevalence of intensive informal care. The design of welfare state regimes and family norms may not necessarily be gender neutral (Haberkern, Schmid and Szydlik 2015). Concerning the welfare state, we consider the public provision of care services and cash-for-care paid to care recipients or providers. Whereas a wide availability of professional care services relieves the care burden of daughters (e.g. Denmark), generous cash-for-care schemes tend to preserve gendered care (e.g. Italy). Cash benefits are mostly distributed to women as they earn less and norms are often strongly in favor of female elderly care (Haberkern, Schmid and Szydlik 2015). The latter is also reflected in the fact that unpaid family and household work is unequally divided in all European countries, although it is most gendered in eastern and southern Europe (Plantenga *et al.* 2009, Worldbank 2018). Strong family norms translate into more care obligations for daughters than sons in these countries (Haberkern, Schmid and Szydlik 2015). This leads us to the fourth hypothesis:

4. a) Particularly in countries with strong gender and family norms daughters are more likely to give care to their parents than sons, b) while siblings' caregiving opportunities are more decisive in other countries.

Data and methods

The analysis uses data from the Survey of Health, Ageing and Retirement in Europe (SHARE) (Börsch-Supan *et al.* 2013). SHARE is a multidisciplinary and cross-national panel survey covering a large number of European countries. Respondents aged 50 and older, together with their cohabiting partners, are inquired into health and well-being, socio-economic status and social and family networks. To address our research questions, we select a sample from the recent SHARE waves 5 and 6 (conducted in 2013 and 2015) (Börsch-Supan 2017a, Börsch-Supan 2017b). SHARE includes consistent information on both care receiving of parents and their children's characteristics across panel waves, enabling us to study the antecedents of care for parents.

The present sample encompasses SHARE respondents with children in wave 5 and 6. The information on children and intergenerational care is aggregated to the couple level in wave 5 as the questionnaire combines care received by both the respondent and his or her partner. From the 40,262 selected households in wave 5, 28,185 are also interviewed in wave 6, yielding 41,264 matched wave 6 interviews with individual respondents aged 50 or older (care receiving is measured per respondent in wave 6)[1]. To examine children's caregiving, the dataset is transposed in the next step. Child observations per respondent (i.e. parent-child dyads) are considered as the unit of analysis and children are identified by gender and birth year to match them between waves[2]. Together with background information on the parent, individual characteristics are stored for each child observation. This results, after excluding lone children (8,203 observations), in a sample of 83,090 parent-child dyads[3].

18.47 per cent of the children in the selected sample show at least one missing value on the variables in the analysis (both waves), resulting in 67,747 complete child observations. The largest share of missing data stems from the reported child characteristics (11,391). Many respondents fail to provide specific data on their own or their partner's descendants, constituting an important deal of item non-

response. To reduce the risk of obtaining biased estimates and avoid a substantial loss of statistical power, missing data are imputed using ICE in Stata (Royston 2005). Ten datasets are generated and imputations are informed by the variables in the analysis. From the imputed datasets sibling characteristics are computed, allowing to conduct a complete set of information on children's siblings. Subsequently, we retain children of age 18 and older in wave 6 (16 or older in wave 5) (N=81,927), taking out children that are generally too young to provide substantial care (1,163 children omitted). A final step is to restrict our sample to children not providing care in wave 5. As mentioned earlier, we take heed of the potential endogenous character of time-changing caregiving predictors of siblings. Hence, these characteristics are measured among children not giving care and related to the subsequent transition to caregiving in wave 6. This leads to a final sample comprising 79,020 dyads. Model estimates from all generated datasets are pooled with the MI ESTIMATE prefix in Stata (Johnson and Young 2011)[4].

Dependent variable and modelling strategy

Whether a child starts taking care of his or her parent is the outcome variable of the analysis. We distinguish between two situations to regard children as caregivers in SHARE. i) Respondents first select children that provided care during the last twelve months and live outside the household. We consider both children shouldering *personal care* (e.g. dressing, bathing, etc.) or *helping with household chores* (e.g. paperwork, home repairs, transportation, shopping etc.) at least weekly as caretakers. ii) Respondents can also identify children living inside the household as caregivers, only if they provided *personal care* (e.g. dressing, bathing, etc.) during the last twelve months. Although it is not asked how often respondents received personal care from persons living inside the household, we assume that co-residing children are frequently involved because of their day-to-day presence (Michaud, Heitmueller and Nazarov 2010). Table 1 shows that children make the caregiver transition in 2.69 per cent of the selected parent-child dyads.

Multilevel binary logistic regression is used to estimate the associations between each child's caregiving and sibling characteristics. The multilevel models nest the 79,020 child observations (level 1) in 53,240 children (level 2) since some children are observed twice (both their father and mother are interviewed), whereas children are nested in 21,311 families (level 3). Hence, we take into account the clustering of children from the same family. The level 3 random-intercept variance reflects the between-family variances not accounted for by the independent variables in the model. The regression models also adjust for the fact that the individual caregiving of a child may result from the caregiving of siblings by including the proportion of siblings providing care as an explanatory variable (cfr. Table 1) (Tolkacheva, Broese van Groenou and van Tilburg 2010). As mentioned earlier, individual actors are assumed to be responsive to behaviors of significant others, i.e. siblings (Leenders 1995, Leenders 1997). The unspecified mutual dependence of siblings' caregiving may lead to biased parameters.

< Insert Table 1 about here >

Independent variables

Table 1 presents descriptive information on the analyzed variables. The independent variables are grouped at three levels: i) children, ii) parents and iii) country. At the country level, we control for the 14 countries parents are living in (Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Israel, Italy, Luxembourg, Slovenia, Spain, Sweden and Switzerland).[5]

Sibling characteristics are of central interest in this paper. Three groups of sibling caregiving predictors are assessed to address our hypotheses: i) gender composition, ii) caregiving costs and iii)

parent-child commitment. The first, gender composition, distinguishes between three groups, with a child's siblings being i) mixed brother(s) and sister(s), ii) (a) brother(s) only and iii) (a) sister(s) only. The models test interaction terms between siblings' gender composition and the individual gender of a child to investigate whether sons or daughters are more or less likely to provide care in varying gender configurations. The second group of variables, reflecting potential caregiving costs, includes indicators of siblings' employment, partner status, parental status and parent-child distance. These are considered among children not providing care, and hence not affected by their care involvement yet, to investigate their influence on the subsequent caregiving transition. As regards the employment and family situation of a child's siblings we examine the proportions of employed and partnered siblings of each child, together with the share of siblings with own children. Furthermore, the child's position is compared to his or her siblings. A child's relative position is captured by dummies indicating whether he or she is the only one not working, without a partner or childless in the sibling group. Also, the analysis considers the closeness to parents in terms of geographic distance. The average parent-siblings geographic distance (standardized per country) and a variable indicating whether a child resides the closest to the parent are studied. Thirdly, parent-child commitment translates into the parent-child contact among siblings. The contact of siblings is grasped by the mean of a variable reflecting the frequency of contact by each sibling with his or her parent. This is expressed by a 7-point scale representing the contact frequency between a child and parent, with 7 denoting daily contact and 1 depicting no contact. A child's relative parent contact is included as a binary variable. Other variables at the sibling level are included as control variables. A dummy variable expressing whether the number of siblings is either one or two or higher controls for the connection between parent care and sibling group size. The likelihood of providing care generally decreases for individual children when more siblings are present. In larger families, the probability increases that children have both positive and negative relationships with their parents (Ward, Spitze and Deane 2009). Further, the models adjust for the fact that a child has at least one half sibling, or step sibling or adopted/foster sibling. Recent inquiry on SHARE data shows that non-biological children are less inclined to provide care for parents (Haberkern, Schmid and Szydlik 2015). Finally, we control for birth order of the child (i.e. first, second or higher order birth). Konrad *et al.* (2002) argue that first-born children tend to avoid family responsibilities via the strategic choice to live farther from their parents.

Individual child characteristics are age (centered at the mean, both a linear and quadratic term included), gender (male and female), education (low, middle and high education), partnership status[6] (not having a partner and having a partner) and employment status[6] ((self-)employed and not employed). Further, the individual contact frequency[6] between the child and parent controls for the dyadic parent-child tie, with following categorization: i) daily, ii) once or more a week, iii) about every two weeks or once a month and iv) less than once a month. A dummy variable indicates whether a child is a biological child or not. The geographic parent-child distance[6] comprises 5 categories: i) living in the same building, (ii) living at a distance less than 5km, iii) living at a distance between 5 and 25km, iv) living at a distance between 25 and 100km and v) living farther away than 100km. The presence of own children is measured in three categories: i) no children, ii) recent birth(s) (within a period of two years previous to the interview) and iii) older children. Financial solidarity is introduced by dichotomies expressing whether children received or gave gifts from or to parents of at least €250 in the twelve months before the interview.

Several *parental characteristics* are selected for the current analysis. Gender, education, partnership status and employment status have a similar coding compared to the variables for children. Household income is computed as a standardized score per country, correcting for between-country differences in income levels. The analysis further incorporates information on the parental neighborhood

of living: either this is a rural area or a small town versus a large town or urban center. The number of limitations with instrumental activities of daily living (e.g. getting out of bed, buying groceries, etc.) is used as a measure of parental health. The scale ranges from 0 (no limitations) to 9 (limited with respect to all activities). In addition, a binary variable reflects whether the parents consumed professional care services in the twelve months preceding the interview. Overnight stays in a nursing home, professional help with personal care and domestic tasks and the use of meals-on-wheels are regarded as formal care receiving.

Addressing European heterogeneity

To gain knowledge on how sibling characteristics differently affect children's caregiving across Europe, the final step of the analysis is to estimate the models per European region. Countries are grouped together as the transition to caregiving is rather infrequently observed between two waves. The classification of countries takes into account i) gender gaps in unpaid care and ii) both family care norms and the coverage of professional care services for elderly. The first group consists of four northwestern European countries: Belgium, Denmark, France and Sweden. The countries are ranked among the most gender egalitarian in terms of time spending on unpaid family work (Worldbank 2018). In tandem with a high coverage of professional care, weaker filial care norms signal a de-familialisation of care in these countries (Haberkern and Szydlik 2010). The second group predominantly includes central European countries: Austria, the Czech Republic, Estonia, Germany, Israel, Luxembourg and Switzerland. According to research using SHARE, the gender gap in caregiving for parents is smaller in this group compared to southern Europe (Haberkern, Schmid and Szydlik 2015). This group is in an intermediate position with respect to the provision of state-services for elderly care (Saraceno and Keck 2010), while a large majority holds fast to strong family obligations (Haberkern, Schmid and Szydlik 2015, Verbakel 2018). The third group involves three Mediterranean countries: Italy, Slovenia and Spain. These countries show the largest gender differences in time spent on unpaid domestic and care work during the last decades (Plantenga et al. 2009, Worldbank 2018). This does not surprise since southern European countries combine a low availability of professional elderly care with strong gender and family norms (Haberkern and Szydlik 2010, Saraceno and Keck 2010, Verbakel 2018).

Results

Table 2 presents the parameters and significance levels of the multilevel logistic regression models, with children's transition to caregiving as the outcome variable. An empty model (not shown) indicates substantial between-family (level 3) differences (variance is 7.94). Adding the proportion of siblings providing care (Model 1), dampens the variance almost completely (variance is 0.01^{7}). The positive regression coefficient expresses that siblings often provide care together ($b = 3.147$, $p < 0.001$). In tandem, this suggests that clustering of children's caregiving within families results from the fact that caring for a parent is generally a shared commitment within sibling groups.

Model 1 (Table 2) also shows that gender plays a vital role in children's transition to caregiving. To test hypothesis 1, interaction terms between individual gender and gender composition of siblings are estimated. The parameter estimates for sibling composition reflect the caregiving differences among sons (reference category gender). These suggest that sons with mixed brothers and sisters ($b = 0.231$, $p < 0.050$) or only brothers ($b = 0.196$, $p < 0.050$) are more likely to initiate care than sons with only sisters. In other words, sons with less sisters feel more compelled to shoulder care tasks. The effect of mixed brothers and sisters weakens in models adjusting for parental, individual and sibling characteristics (Model 2-5). The b-coefficient of gender tells the difference between sons' and daughters' transition to caregiving when a

child has sisters only (reference category gender composition). In this gender configuration, we find that daughters are more frequently providing care compared to sons (b = 0.409, p < 0.001). Further, the interaction terms between individual gender and gender composition of siblings express whether daughters' caregiving start diverges from sons according to the share of brothers. The models indicate that the impact of siblings' gender composition does not vary greatly between sons and daughters. As a result, care for parents is allocated more often to the one daughter if she has brothers only, whereas sons divide care in brothers-only sibling groups. In sum, our results support the first hypothesis (a) since, irrespective of siblings' gender composition, daughters start caring the most. Furthermore, sons proceed to caregiving more when daughters are not present, while a daughter has higher odds to care in case of having brothers only. Hence, this provides evidence for part b of the first hypothesis: daughters make the transition to care provision most in families with a greater part of sons.

< Insert Table 2 about here >

Models 3 to 5 include other sibling characteristics. This part of the analysis examines whether children are more likely to start providing care in relation to the caregiving costs and involvement of their siblings. Model 3 exhibits a significant association between a child's care transition and the average geographic parent-child distance of siblings (b = 0.140, p < 0.001). Greater geographic parent-siblings distances encourage children's caregiving. In addition, we observe that a higher contact frequency between the parent and a child's siblings reduces the odds of starting to care (b = -0.207, p < 0.001). This implies, in turn, that a child starts caregiving more often when his or her siblings have, on average, less closer bonds with their parents. Model 4 introduces the relative measures of a child's care opportunities within the sibling group. The parameter estimates reveal that a child's position regarding employment responsibilities is associated with the start of care. Being the only jobless child facilitates care (b = 0.303, p < 0.010). In a similar vein, living closest to the parent (b = 0.302, p < 0.001) and being in closest contact (b = 0.490, p < 0.001) positively affects the start of caretaking. This corresponds with the results of Model 3, underlining the important role of siblings' geographic distances and contact frequencies. Moreover, Model 5 points out that net of being the child living closest, average sibling distances matter for care provision. In other words, larger parent-siblings distances enhance children's caregiving transition, regardless of the child being the nearest descendant or not. The same goes for parent-child contact frequency of siblings. Despite being the child in closest contact or not, the odds of starting to care are higher when the average parent-sibling contact is limited. Taken together, we find some evidence for hypothesis 2, concluding that children more frequently make the transition to care when siblings experience higher costs in terms of travelling distance and employment responsibilities. Concerning hypothesis 3, the analysis corroborates that children are more likely to start caregiving if their siblings have less parent-child contact.

As to the individual child characteristics, we find that children with a higher age, having only one sibling, being a second or higher-order birth, being a biological child of the parent, holding an intermediate educational degree, keeping frequent contact with the parent, living in the proximity of the parent and exchanging financial resources with his or her parent are more inclined to start providing care. Employment, partnership status, childbearing and siblings' descent are only weakly related. As regards parental characteristics, we observe more frequent care provision for mothers. Besides, positive effects are found for singlehood, low educational degrees, not having a job, living outside of urban areas, higher functional limitations and receiving professional care services

European heterogeneity in sibling influences

To explore whether sibling characteristics affect caregiving transitions similarly across different European regions, the last part of the analysis tests our models for three country groups separately: i) northwestern (Belgium, Denmark, France and Sweden), ii) central (Austria, the Czech Republic, Estonia, Germany, Israel, Luxembourg and Switzerland) and iii) Mediterranean Europe (Italy, Slovenia and Spain). In this order, the top row of Figure 1 presents the predicted probabilities of starting to care for different gender configurations per region (cfr. Model 2). Notice that the probability scales differ between the panels. The panels for northwestern and central Europe suggest limited gender differences. In general, sons with sisters only or mixed brothers and sisters are least inclined to commence caregiving. However, except for daughters with brothers only, starting to care the most in both country groups, son-daughter differences are not statistically significant. In neither country groups the care probabilities between sons and daughters with brothers only vary significantly. Also, gender composition of siblings impacts caregiving weakly if sons and daughters are considered separately. The third panel paints a very different picture for Mediterranean countries. The 95% confidence intervals demonstrate that sons with brothers only make the transition to caregiving significantly more than sons with sisters. Moreover, daughters appear to start caregiving significantly more than sons in all gender compositions. In particular, daughters are most likely to care when having brothers. As such, our findings elucidate that gender and siblings' gender composition influence care provision to a greater extent in countries characterized by stronger family and gender norms (cfr. hypothesis 4a).

The second and third row of Figure 1 exhibit the effects of other sibling characteristics on children's transition to care per country group (cfr. Model 3-4). The magnitude of the effects show considerable variety as the panel scales differ. The panels of the second row reflect the expected changes in care probabilities if a proportion or average sibling characteristic increases by one unit (e.g. percentage point). As anticipated from Model 3, the average siblings-parent geographic distance and siblings-parent contact frequency are statistically significant in all country groups. Only in the Mediterranean group a zero-effect of siblings' distance lies within the confidence interval, implying a weak association with care. In this country group a significant positive effect of the proportion of siblings with own children is observed, suggesting the importance of competing family demands. For central European countries, we find a positive association between starting to care and the proportion of siblings with a partner. The third row presents the changes in care probabilities in accordance with relative sibling characteristics. For all three country groups we find that the only child not working has a higher probability to embark on caregiving, although the effects are not statistically significant. Being the only jobless child is infrequent (cfr. Table 1), limiting the statistical power of the effects. The panels also reveal significantly positive effects on the probabilities of starting care for children living closest to the parent, except for the northwestern countries. Being the child in closest contact with a parent particularly increases care probabilities in northwestern and central Europe. Finally, the results suggest a marginally significant negative effect of being the only child without a partner for northwestern European countries. Overall, we find no evidence for the hypothesis (4b) that siblings' caregiving opportunities are stronger predictors in one or the other country group.

< Insert Figure 1 about here >

Discussion

The present study illuminates the role of sibling characteristics, such as gender composition and caregiving costs, to explain differences in children's caregiving for parents. By doing so, this research is among the first in Europe to address the interrelationships between siblings in the context of intergenerational care.

The longitudinal research design of the study enabled us to start disentangling the temporal ordering of the connection between sibling predictors and individual caregiving. The analysis relates sibling caregiving costs and parent-child commitment of siblings in the pre-caregiving phase to the subsequent care transition.

Previous research has provided abundant evidence for the prominent position of daughters in taking care of older parents. Our approach is novel in comparing sons and daughters between various gender compositions of the sibling group. In line with recent American inquiry (Grigoryeva 2017), the results confirm that daughters are most likely to enter a caring role, especially in families with brothers only (cfr. hypothesis 1). Sons, from their side, start caregiving more in the absence of sisters. Male-dominated compositions necessitate sons to divide care between brothers. These gender differences remain after accounting for individual and sibling characteristics. Hence, the primacy of daughters in caring for parents is not attributable to other factors (Haberkern, Schmid and Szydlik 2015), including daughters' care opportunities from a sibling perspective (e.g. being the only sibling without work). Country comparisons reveal that gendered intergenerational care predominantly applies to southern European countries. Although a daughter with brothers only has the highest care probabilities in all country groups, the gender gap is most eminent in Italy, Spain and Slovenia. This enhances our knowledge on how care distributions are contingent on the family's gender configuration across Europe. In northern and central Europe intensive care tasks are frequently transferred to professional providers (Brandt 2013), easing the care burden of daughters in particular (Haberkern, Schmid and Szydlik 2015), whereas elderly care is the responsibility of the family and most notably daughters in Mediterranean countries (Verbakel 2018, Viazzo 2010). Especially in countries with strong family norms the gendered nature of care remains a vital aspect of caregiving for parents (cfr. hypothesis 4a). We also note that a potentially important aspect of gender differentials lacks in our analysis as we do not control for the care provision of children-in-law. Our results might reflect larger gender gaps among children in countries where daughters-in-law take the care burden instead of sons (Merrill 1993).

Going beyond gender composition, the results point out that parent-siblings contact and geographic distances between siblings and their parents influence the onset of children's care. Both average scores as well as relative measures of those sibling characteristics are strong predictors. The findings are also consistent over different European regions. The overriding importance of siblings' contact frequency and proximity does not surprise as it are crucial determinants at the individual level as well. As regards contact frequency, we observe that children with relatively more contact are also more inclined to start caregiving. The measures reflect to what extent parents and siblings are committed and maintain good connections. Children with a good parent contact prior to the caregiving stage may also be well informed about the needs of parents and constitute the preferred care provider later on. As such, our findings correspond with a previous study suggesting that committed children compensate for siblings with weak parent-child ties, being in an unfavorable position to provide care (Tolkacheva, Broese van Groenou and van Tilburg 2010). The outcomes concerning siblings' geographic parent-child distances reconfirm that the family's spatial dispersion is important for informal caregiving. In accordance with research asserting that a closer geographic proximity facilitates care exchanges, we observe that the closest residing children and children with siblings living at farther distances are most likely to commence caretaking. Given that children with high-quality parent-child relationships, and thus more willingness to give care, are prone to live near their parents (Gillespie and Treas 2017, Gillespie and Van der Lippe 2015), it is meaningful that these associations hold when correcting for contact frequency of the individual child and his or her siblings.

In contrast to the considerable impact of interaction barriers (i.e. geographic distance) and parent-siblings commitment (i.e. contact frequency), the influence of siblings' competing family demands on the care transition appears limited. Our results do not corroborate earlier research indicating that higher proportions of siblings with a partner or children increases a child's care (Henretta, Soldo and Van Voorhis 2011; Tolkacheva, Broese van Groenou and van Tilburg 2010). Country comparisons show that we only observe some weak effects in central and southern European countries respectively. In those regions stronger family obligations may also work in a different direction. Children's responsibility to look after their descending family may outweigh care for other relatives, inducing higher odds of elderly care among their siblings. With respect to the competing demands of employment, our study finds a salient significance of being the only child without a job. Being the sibling unconstrained by time regimes of paid work increases the likelihood of entering the caregiving role. From a sibling perspective, employment plays a steering role in distributing care for parents. The employment indicators are however limited since no detailed information on the flexibility of employment is available (e.g. reduced hours, flexible working schedules,…).

Most of the results are consistent with the important Finch and Mason's (1993) qualitative examination of siblings negotiating responsibilities within the family. Children with "legitimate excuses" or high caregiving costs are inclined to allocate care for parents to siblings (cfr. hypothesis 2), while children with less family-involved siblings are likely to provide care (cfr. hypothesis 3). Altogether, the impact of siblings' caregiving costs and parent-child commitment does not vary substantially between European regions (cfr. hypothesis 4b).

The analysis of this paper is restricted by some noteworthy limitations that warrant future inquiry. First, in SHARE-interviews parents provide the information on children. Some parents might be selective in reporting on their children. Children having a difficult relationship with their parents are likely to be shunned, introducing bias. The indirect data recording also increases non-response on certain child characteristics. In addition, this procedure hampers the longitudinal follow-up of children, excluding multiple same-sex births from the analysis. A second limitation is the crude outcome variable of the regression models. Whereas we select on frequency (at least weekly) of care, the measure is unrefined with respect to caregiving intensity. Future research should improve knowledge on more subtle contrasts regarding type and hours of provided care. Some argue that most research focuses on typical female care tasks, yielding exaggerated gender differentials in care provision. Adding or distinguishing between other types of support (e.g. gardening, home repairs, settling financial matters, etc.) might improve the relative position of sons. Another promising avenue of research is the expansion of the longitudinal observation window. Our current analysis is limited to the initial transition to care for parents, while recent investigation demonstrates the volatility of caregiver networks over time (Szinovacz and Davey 2013). Together with capturing the dynamic nature of informal caregiving, an elaborated longitudinal approach taps changes in children's life circumstances (e.g. job changes, geographic relocations, etc.), affecting their caregiving opportunities. A final limitation is that the analysis pools countries to address the cross-national variation of the sample. Future research should explore country variation in more detail.

Despite the shortcomings of the current study, it shows that siblings can play an important role vis-à-vis individual decisions on providing care for parents. We add to family system theory that individual features are not sufficient to predict a child's caregiving. The sibling perspective is identified as a fruitful approach to explain intergenerational care differences between children in European countries. At present, and for the first decades to come, older people in Europe often have a rich pool of family members upon which to call for personal assistance. However, in the context of population ageing,

shrinking families and welfare systems under pressure, it is essential to understand how the intra-family organization of intergenerational caregiving will further develop.

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Table 1. Descriptive statistics of (in)dependent variables for selected sample of parent-child dyads

	Range	%[a]	Mean (s.d.)[a]
Child-level covariates			
Proportion siblings giving care to parents	0-1		0.0508 (0.1938)
Siblings are mixed brothers and sisters	0 or 1	34.97	
Siblings are only brothers	0 or 1	33.39	
Siblings are only sisters	0 or 1	31.65	
Proportion siblings employed[b]	0-1		0.7846 (0.3460)
Proportion siblings with partner[b]	0-1		0.5365 (0.4272)
Proportion siblings with own kid(s)[b]	0-1		0.6002 (0.4238)
Average parent-siblings distance (z-score)[b]	-0.7-5.9		0.0031 (0.8360)
Average parent-siblings contact frequency [b]	1-7		5.6122 (1.3012)
Only child not working[b]	0 or 1	8.80	
Only child without partner[b]	0 or 1	12.00	
Only child without own kid(s)[b]	0 or 1	11.27	
Child lives closest to parent[b]	0 or 1	58.47	
Child in closest contact with parent[b]	0 or 1	62.61	
Age	18-108		40.8252 (10.2778)
Female	0 or 1	48.66	
Low education	0 or 1	15.55	
Middle education	0 or 1	46.34	
High education	0 or 1	38.12	
Having a partner[b]	0 or 1	55.83	
Employed[b]	0 or 1	79.63	
Two or more siblings	0 or 1	56.89	
First born child	0 or 1	38.53	
Second born child	0 or 1	37.88	
Third or later born child	0 or 1	23.59	
Having (a) non-biological sibling(s)	0 or 1	9.37	
Not a biological child of parent	0 or 1	4.56	
In daily contact with parent[b]	0 or 1	34.14	
Once or more a week contact with parent[b]	0 or 1	47.44	
Each two weeks-once/month contact with parent[b]	0 or 1	12.51	
Less than once a month contact with parent[b]	0 or 1	5.91	
Living in same building with parents[b]	0 or 1	17.38	
Parent-child distance < 5km[b]	0 or 1	25.95	
Parent-child distance 5-25km[b]	0 or 1	21.39	
Parent-child distance 25-100km[b]	0 or 1	15.44	
Parent-child distance > 100km[b]	0 or 1	19.84	
No children	0 or 1	34.36	
Recent child	0 or 1	9.45	
Older child(ren)	0 or 1	56.19	
Received gift from parent	0 or 1	9.87	
Gave gift to parent	0 or 1	1.86	
Parent-level covariates[c]			
Female	0 or 1	58.76	
Having a partner	0 or 1	65.38	

Table 1 (continued).

Low education	0 or 1	38.27	
Middle education	0 or 1	38.16	
High education	0 or 1	23.57	
Employed	0 or 1	23.56	
Household income (z-score)	-2.0-8.9		-0.0219 (1.0121)
Living in a small town/rural area	0 or 1	62.59	
Number of iADL limitations	0-9		0.5599 (1.5711)
Receiving formal care	0 or 1	10.50	
Country (omitted)			
Dependent variable			
Child starts providing care for parent	0 or 1	2.69	

Table 1 presents variables (incl. missings) of the original dataset, N (total = 79,020) depends on missing values for variable of consideration; source: SHARE wave 5-6, calculations by authors

[a] The proportions are presented for categorical variables, means and standard deviations for continuous variables.

[b] Measured at wave 5 because covariates are potentially endogenous to caregiving for parents.

[c] Descriptive figures are presented at the parent-level (not representing parent-child dyads).

Table 2. Regression coefficients of multilevel logistic regression analysis of children's transition to care for parents (not providing care ref.)

	Model 1		**Model 2**		**Model 3**		**Model 4**		**Model 5**	
	b	*Sig.*	*b*	*Sig.*	*b*	*Sig.*	*b*	*Sig.*	*b*	*Sig.*
Child-level covariates										
Proportion siblings giving care to parents	3.147	***	2.591	***	0.279	***	2.644	***	2.791	***
Siblings are mixed brothers and sisters *(only sisters ref.)*	0.231	*	-0.082		-0.079		-0.053		-0.054	
Siblings are only brothers	0.196	*	0.245	**	0.230	*	0.233	*	0.236	*
Female *(male ref.)*	0.409	***	0.427	***	0.435	***	0.416	***	0.425	***
Female*Siblings are mixed brothers and sisters	-0.004		0.106		0.091		0.124		0.112	
Female*Siblings are only brothers	-0.029		-0.012		-0.038		-0.008		-0.032	
Proportion siblings employed[a]					0.026				-0.136	
Proportion siblings with partner[a]					0.108				0.121	
Proportion siblings with own kid(s)[a]					0.008				0.018	
Average parent-siblings distance (z-score)[a]					0.140	***			0.124	***
Average parent-siblings contact frequency[a]					-0.207	***			-0.172	***
Only child not working *(not ref.)* [a]							0.303	**	0.399	**
Only child without partner *(not ref.)* [a]							0.024		-0.069	
Only child without own kid(s) *(not ref.)* [a]							-0.006		-0.032	
Child lives closest to parent *(not ref.)* [a]							0.302	***	0.182	*
Child in closest contact with parent *(not ref.)*[a]							0.490	***	0.295	***
Age (centered)			0.034	***	0.030	***	0.032	***	0.030	***
Age (centered)^2			-0.001	**	-0.001	*	-0.001	*	-0.001	
Two or more siblings *(one ref.)*			-0.141	*	-0.128		-0.222	**	-0.175	**
Second born child *(first ref.)*			0.238	***	0.199	**	0.227	***	0.201	**
Third or later born child			0.321	***	0.236	**	0.295	***	0.238	**
Not a biological child of parent			-1.460	***	-1.462	***	-1.464	***	-1.469	***
Having (a) non-biological sibling(s)			0.102		-0.055		0.085		-0.044	
Middle education *(low ref.)*			0.215	**	0.220	**	0.201	**	0.215	**
High education			0.100		0.100		0.070		0.088	
Having a partner *(not ref.)* [a]			-0.103		-0.101		-0.093		-0.131	
Employed *(not ref.)* [a]			-0.038		-0.020		0.110		0.192	*
In daily contact with parent *(once or more a week ref.)*[a]			0.629	***	0.698	***	0.394	***	0.551	***
Each two weeks-once/month contact with parent[a]			-0.843	***	-0.947	***	-0.680	***	-0.837	***
Less than once a month contact with parent[a]			-1.989	***	-2.143	***	-1.796	***	-2.013	***

Table 2 (continued).

Living in same building *(parent-child distance 5-25km ref.)* [a]			0.533	***	0.499	***	0.335	***	0.389	***
Parent-child distance < 5km[a]			0.330	***	0.327	***	0.219	**	0.263	***
Parent-child distance 25-100km[a]			-0.344	***	-0.344	***	-0.301	**	-0.321	**
Parent-child distance > 100km[a]			-0.994	***	-1.046	***	-0.933	***	-1.010	***
Recent child *(no children ref.)*			-0.200		-0.210		-0.199		-0.216	
Older child(ren)			0.030		0.022		0.038		0.016	
Received gift from parents *(none ref.)*			0.351	***	0.348	***	0.350	***	0.347	***
Gave gift to parents *(none ref.)*			0.449	***	0.477	***	0.451	***	0.479	
Parent-level covariates										
Female *(male ref.)*			0.293	***	0.313	***	0.311	***	0.325	***
Having a partner *(not ref.)*			-0.435	***	-0.403	***	-0.447	***	-0.413	***
Middle education *(low ref.)*			-0.150	**	-0.170	**	-0.177	**	-0.177	**
High education			-0.318	***	-0.367	***	-0.364	***	-0.382	***
Employed *(not ref.)*			-0.250	**	-0.213	*	-0.238	*	-0.214	*
Household income (z-score)			-0.004		0.005		0.001		0.008	
Living in a small town/rural *(large town/urban center ref.)*			0.131	*	0.141	*	0.149	*	0.153	**
Number of iADL limitations			0.184	***	0.184	***	0.193	***	0.189	***
Receiving formal care *(not ref.)*			0.673	***	0.636	***	0.634	***	0.616	***
Country										
Germany *(Austria ref.)*	-0.172		0.257	*	0.239		0.254		0.237	
Sweden	-1.085	***	-0.486	**	-0.520	**	-0.589	**	-0.571	**
Spain	0.361	**	-0.035		0.063		-0.023		0.047	
Italy	-0.012		-0.324	*	-0.229		-0.305	*	-0.244	
France	-0.131		0.042		0.008		-0.019		-0.025	
Denmark	-0.690	***	-0.148		-0.175		-0.251		-0.227	
Switzerland	-1.023	***	-0.608	**	-0.667	**	-0.670	**	-0.697	***
Belgium	-0.220		-0.174		-0.216		-0.214		-0.239	
Israel	0.350	**	0.075		0.187		0.084		0.176	
Czech Republic	0.442	***	0.809	***	0.760	***	0.791	***	0.758	***
Luxembourg	-1.014	**	-0.975	**	-0.971	**	-0.982	**	-0.971	**
Slovenia	0.371	**	0.267	*	0.313	*	0.319	*	0.324	*
Estonia	0.072		0.635	***	0.594	***	0.592	***	0.578	***

N = 79,020; source: SHARE wave 5-6, calculations by authors; * p < 0.05, ** p < 0.01, *** p < 0.001

[a] Measured at wave 5 because covariates are potentially endogenous to caregiving for parents.

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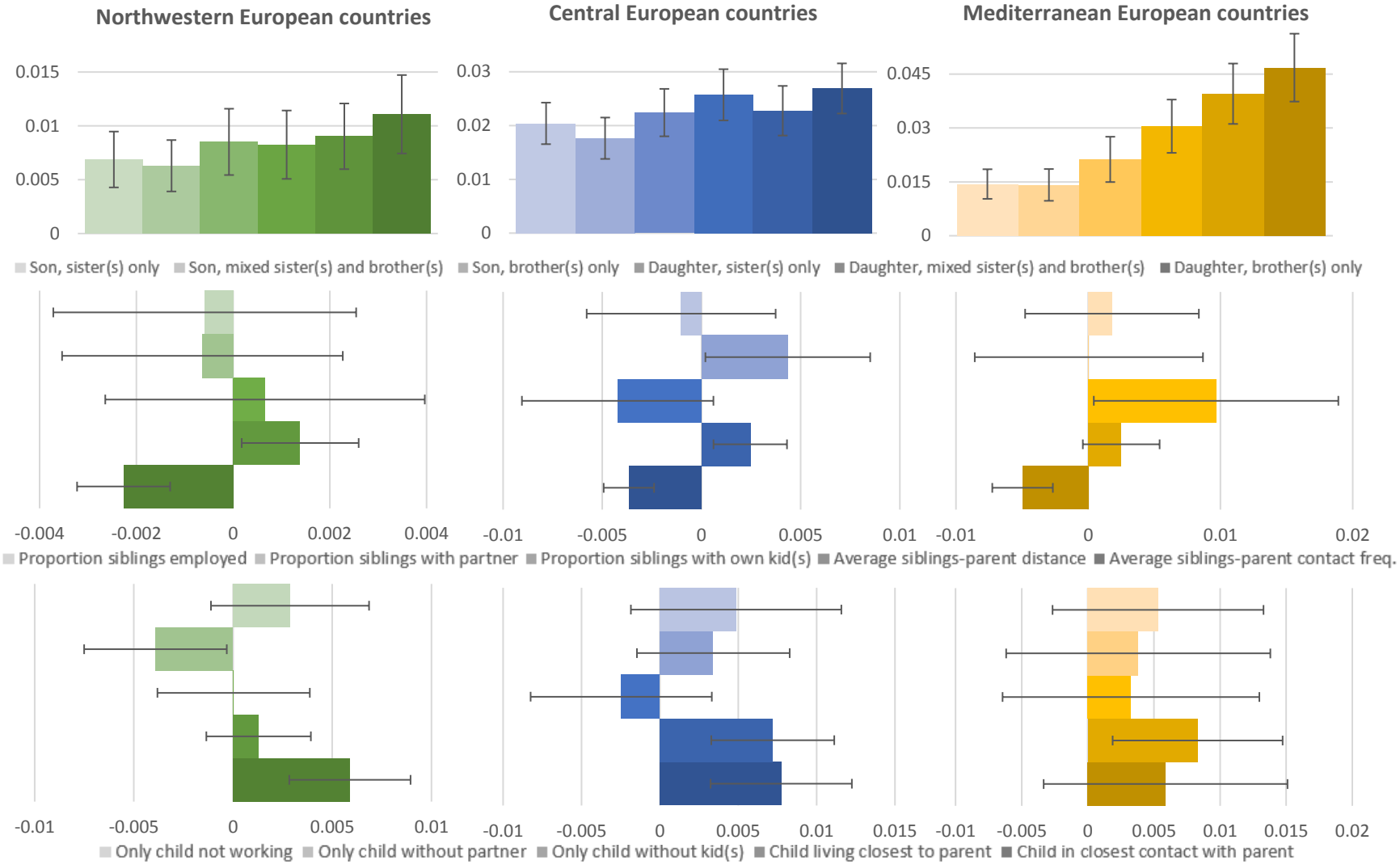
Figure 1. Predicted probabilities (first row) and average marginal effects in predicted probabilities of starting to care (second and third row)



N = 79,020; source: SHARE wave 5-6, calculations by authors

The first column of panels presents the northwestern country group (shades of green), the second the central group (shades of blue) and the third Mediterranean countries (shades of yellow); notice that the probability scales differ between panels.

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Endnotes

[1] Given a lack of information on care receiving in wave 5, new household members interviewed in wave 6 are not included in the sample.
[2] We omit multiple births (children with identical birth years) of the same sex as these are prone to erroneous matching.
[3] Note that newly reported children in wave 6 are not considered since we assume that they are less important for caregiving and we lack their individual wave 5 information.
[4] The substantive interpretations drawn from sensitivity analysis using a listwise deletion method are similar (available on request).
[5] Countries are included in the model as fixed dummy variables. Additional analysis using multilevel models estimating random intercepts per country suggest that our results are robust.
[6] Individual characteristics are measured at wave 5 as those are likely to be endogenous to caregeving for parents.
[7] A sensitivity analysis of model 5 (including all covariates) that omits the proportion of caregiving siblings as a control variable reports a between-family variance of 5.61.

References

Agree, E.M. and Glaser, K. 2009. Demography of informal caregiving. In *International handbook of population aging*. Springer, 647-668.

Allan, G. 1977. Sibling solidarity. *Journal of Marriage and the Family*, 39, 177-184.

Bengtson, V.L. and Allen, K.R. 1993. The life course perspective applied to families over time. In Boss, P., Doherty, W., LaRossa, R., Schumm, W. and Steinmetz, S. (eds), *Sourcebook of family theories and methods: A contextual approach*. Plenum Press, New York, 469-498.

Bianchi, S.M., Hotz, V.J., McGarry, K. and Seltzer, J.A. 2006. Intergenerational ties: Alternative theories, empirical findings and trends, and remaining challenges. In *UCLA CCPR Population Working Papers*.

Bolin, K., et al. (2008). Your next of kin or your own career?: Caring and working among the 50+ of Europe. *Journal of health economics*, 27, 3, 718-738.

Bonsang, E. 2007. How do middle-aged children allocate time and money transfers to their older parents in Europe? *Empirica*, 34, 2, 171-188.

Börsch-Supan, A. 2017a. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 5. SHARE-ERIC.

Börsch-Supan, A. 2017b. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 6. HARE-ERIC.

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S. and Zuber, S. 2013. Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology*, 42, 4, 992-1001.

Brandt, M. 2013. Intergenerational help and public assistance in Europe: A case of specialization? *European Societies*, 15, 1, 26-56.

Brandt, M., Haberkern, K. and Szydlik, M. 2009. Intergenerational help and care in Europe. *European Sociological Review*, 25, 5, 585-601.

Broese van Groenou, M. and De Boer, A. 2016. Providing informal care in a changing society. *European Journal of Ageing*, 13, 3, 271-279.

Carmichael, F., Charles, S. and Hulme, C. 2010. Who will care? Employment participation and willingness to supply informal care. *Journal of Health Economics*, 29, 1, 182-190.

Checkovich, T.J. and Stern, S. 2002. Shared caregiving responsibilities of adult siblings with elderly parents. *Journal of Human Resources*, 37, 3, 441-478.

Cox, M.J. and Paley, B. 1997. Families as systems. *Annual review of psychology*, 48, 1, 243-267.

Cunningham, M. 2001a. The influence of parental attitudes and behaviors on children's attitudes toward gender and household labor in early adulthood. *Journal of Marriage and family*, 63, 1, 111-122.

Cunningham, M. 2001b. Parental influences on the gendered division of housework. *American Sociological Review*, 66, 184-203.

Erickson, R.J. 2005. Why emotion work matters: Sex, gender, and the division of household labor. *Journal of marriage and family*, 67, 2, 337-351.

Finch, J. and Mason, J. 1993. *Negotiating family responsibilities*. Routledge, London.

Finley, N.J. 1989. Theories of family labor as applied to gender differences in caregiving for elderly parents. *Journal of Marriage and the Family*, 79-86.

Gillespie, B.J. and Treas, J. 2017. Adolescent Intergenerational Cohesiveness and Young Adult Proximity to Mothers. *Journal of Family Issues*, 38, 6, 798-819.

Gillespie, B.J. and Van der Lippe, T. 2015. Intergenerational cohesiveness and later geographic distance to parents in the Netherlands. *Advances in life course research*, 23, 56-66.

Grigoryeva, A. 2017. Own gender, sibling's gender, parent's gender: The division of elderly parent care among adult children. American Sociological Review, 82, 1, 116-146.

Haberkern, K. and Szydlik, M. 2010. State care provision, societal opinion and children's care of older parents in 11 European countries. *Ageing & Society*, 30, 2, 299-323.

Haberkern, K. , Schmid, T. and Szydlik, M. 2015. Gender differences in intergenerational care in European welfare states. *Ageing & Society*, 35, 298-320.

Hank, K. 2007. Proximity and contacts between older parents and their children: A European comparison. *Journal of Marriage and Family*, 69, 1, 157-173.

Henz, U. 2006. Informal Caregiving at Working Age: Effects of Job Characteristics and Family Configuration. *Journal of Marriage and Family*, 68, 2, 411-429.

Henretta, J.C., Soldo, B.J. and Van Voorhis, M.F. 2011. Why do families differ? Children's care for an unmarried mother. *Journal of Marriage and Family*, 73, 2, 383-395.

Igel, C., Brandt, M., Haberkern, K. and Szydlik, M. 2009. Specialization between family and state intergenerational time transfers in Western Europe. *Journal of Comparative Family Studies*, 203-226.

Ingersoll-Dayton, B., Neal, M.B., Ha, J. and Hammer, L.B. 2003. Redressing inequity in parent care among siblings. *Journal of Marriage and Family*, 65, 1, 201-212.

Johnson, D.R. and Young, R. 2011. Toward best practices in analyzing datasets with missing data: Comparisons and recommendations. *Journal of Marriage and Family*, 73, 5, 926-945.

Joseph, A.E. and Hallman, B.C. 1998. Over the hill and far away: distance as a barrier to the provision of assistance to elderly relatives. *Social Science & Medicine*, 46, 6, 631-639.

Klimaviciute, J., Perelman, S., Pestieau, P. and Schoenmaeckers, J. 2017. Caring for dependent parents: Altruism, exchange or family norm? *Journal of Population Economics*, 30, 3, 835-873.

Knudsen, K. and Wærness, K. 2008. National context and spouses' housework in 34 countries. *European Sociological Review*, 24, 97-113.

Konrad, K.A., Künemund, H., Lommerud, K.E. and Robledo, J.R. 2002. Geography of the family. *American Economic Review*, 92, 981-998.

Lachance-Grzela, M. and Bouchard, G. 2010. Why Do Women Do the Lion's Share of Housework? A Decade of Research. *Sex Roles*, 63, 11-12, 767-780.

Leenders, R.T.A. 1995. Structure and influence: Statistical models for the dynamics of actor attributes, network structure and their interdependence. In University of Groningen, Amsterdam.

Leenders, R.T.A. 1997. Longitudinal behavior of network structure and actor attributes: modeling interdependence of contagion and selection. In Doreian, P. and Stokman, F.N. (eds), *Evolution of social networks*. Gordon and Breach, New York.

Leopold, T., Raab, M. and Engelhardt, H. 2014. The transition to parent care: Costs, commitments, and caregiver selection among children. *Journal of Marriage and Family*, 76, 2, 300-318.

Matthews, S.H. 2002. *Sisters and brothers/daughters and sons: Meeting the needs of old parents*. Unlimited Publishing LLC.

Merrill, D.M. 1993. Daughters-in-law as caregivers to the elderly: Defining the in-law relationship. Research on Aging, 15, 1, 70-91.

Michaud, P., Heitmueller, A. and Nazarov, Z. 2010. A dynamic analysis of informal care and employment in England. *Labour Economics*, 17, 3, 455-465.

Pettersson, A. and Malmberg, G. 2009. Adult children and elderly parents as mobility attractions in Sweden. *Population, Space and Place*, 15, 4, 343-357.

Pillemer, K. and Suitor, J.J. 2006. Making choices: A within-family study of caregiver selection. *The Gerontologist*, 46, 4, 439-448.

Pillemer, K. and Suitor, J.J. 2013. Who provides care? A prospective study of caregiving among adult siblings. *The Gerontologist*, 54, 4, 589-598.

Plantenga, J., Remery, C., Figueiredo, H. and Smith, M. 2009. Towards a European Union gender equality index. *Journal of European Social Policy*, 19, 1, 19-33.

Royston, P. 2005. Multiple imputation of missing values: update. *Stata Journal*, 5, 2, 188.

Saraceno, C. and Keck, W. 2010. Can we identify intergenerational policy regimes in Europe? *European Societies*, 12, 5, 675-696.

Silverstein, M., Conroy, S.J. and Gans, D. 2008. Commitment to Caring: Filial Responsibility and the Allocation of Support by Adult Children to Older Mothers. In Szinovacz, M.E. and Davey, A. (eds), *Caregiving Contexts: Cultural, Familial, and Societal Implications*. Springer, New York, 71-92.

Silverstein, M., Conroy, S.J., Wang, H., Giarrusso, R. and Bengtson, V.L. 2002. Reciprocity in parent–child relations over the adult life course. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 57, 1, S3-S13.

Silverstein, M., Gans, D. and Yang, F.M. 2006. Intergenerational Support to Aging Parents:The Role of Norms and Needs. *Journal of Family Issues*, 27, 8, 1068-1084.

Smits, A., Van Gaalen, R.I. and Mulder, C.H. 2010. Parent–child coresidence: who moves in with whom and for whose needs? *Journal of Marriage and Family*, 72, 4, 1022-1033.

Stern, S. 1995. Estimating family long-term care decisions in the presence of endogenous child characteristics. *Journal of human Resources*, 551-580.

Szinovacz, M.E. and Davey, A. 2013. Changes in adult children's participation in parent care. *Ageing & Society*, 33, 4, 667-697.

Tolkacheva, N., Broese van Groenou, M., De Boer, A. and Van Tilburg, T. 2011. The impact of informal care-giving networks on adult children's care-giver burden. *Ageing & Society*, 31, 1, 34-51.

Tolkacheva, N., Broese van Groenou, M. and van Tilburg, T. 2010. Sibling influence on care given by children to older parents. *Research on Aging*, 32, 6, 739-759.

Tolkacheva, N., Broese van Groenou, M. and van Tilburg, T. 2014. Sibling similarities and sharing the care of older parents. *Journal of Family Issues*, 35, 3, 312-330.

Van Houtven, C. H., et al. (2013). The effect of informal care on work and wages. *Journal of health economics*, 32, 1, 240-252.

Verbakel, E., Tamlagsrønning, S., Winstone, L., Fjær, E.L. and Eikemo, T.A. 2017. Informal care in Europe: findings from the European Social Survey (2014) special module on the social determinants of health. *The European Journal of Public Health*, 27, suppl_1, 90-95.

Verbakel, E. 2018. How to understand informal caregiving patterns in Europe? The role of formal long-term care provisions and family care norms. *Scandinavian Journal of Public Health*, 436-447.

Viazzo, P.P. 2010. Family, kinship and welfare provision in Europe, past and present: Commonalities and divergences. *Continuity and Change*, 25, 1, 137-159.

Ward, R.A., Spitze, G. and Deane, G. 2009. The more the merrier? Multiple parent-adult child relations. *Journal of Marriage and Family*, 71, 1, 161-173.

Wolf, D.A., Freedman, V.A. and Soldo, B.J. 1997. The division of family labor: Care for elderly parents. *Journals of Gerontology Series B*, 52, 102-109.

Worldbank 2018. Gender Statistics: proportion of time spent on unpaid domestic and care work, female to male. United Nations Statistics Division.