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Grandchild care and eldercare. A quid pro quo arrangement

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ABSTRACT

The phenomenon of grandparents assuming the role of caretakers for their grandchildren is substantial and on the rise; a trend partially attributed to mothers' increased participation in the workforce. While altruism is commonly assumed to be the primary driver behind such caregiving, we examine an additional motivation: the expectation among grandparents that they will receive care from their offspring in the event of their own incapacity. This study investigates this hypothesis from theoretical and empirical perspectives. Initially, we construct a theoretical framework, delineating a sub-game perfect Nash equilibrium model wherein the grandparent first commits to caring for the grandchild, followed by anticipation of receiving care from their adult child in disability scenarios. Subsequently, we empirically test the feasibility of this model by analysing data sourced from the Survey of Health, Ageing and Retirement in Europe. Our results confirm that elderly parents who cared for their grandchildren received more support from their children in the case of a loss of autonomy.

1. Introduction

The phenomenon of intergenerational caregiving in which elderly individuals initially provide care for their grandchildren before eventually receiving care from their own children, illustrates complex familial dynamics and shifting societal norms. Considerable evidence has demonstrated that grandparents actively contribute to childcare.¹ According to Hank and Buber (2009), about half of European grandparents are involved in childcare (Hank and Buber, 2009), although heterogeneity exists across countries. In addition, the vast majority of elderly people who need assistance receive care exclusively from family caregivers—predominantly wives and daughters (Cremer et al., 2012). This cycle of care reflects broader global demographic, economic and health trends, encompassing social support, role reversals and evolving familial responsibilities. Healthcare advances have extended life expectancy, allowing grandparents to maintain active involvement in their grandchildren's lives for longer periods. This extended interaction enhances intergenerational bonding and provides mutual benefits. Economic necessities such as dual-income households and rising childcare costs often compel grandparents to assume childcare responsibilities, which not only provides economic relief but also strengthens emotional ties across generations.

Culturally, this reciprocal care is embedded in many societies, where caregiving is a respected duty that reinforces familial bonds. However, the impact of caregiving on elderly individuals can be dual-faceted. Engaging with grandchildren can offer physical, cognitive and social benefits; however, the demands of caregiving may pose health risks, particularly for those with limited physical capabilities or pre-existing conditions. Eventually, the caregiving role may reverse, with adult children assuming greater responsibilities for their ageing parents. This shift can challenge elderly individual's independence and dignity, requiring adjustments to family dynamics and mutual support strategies. The caregiving cycle among grandparents, grandchildren and adult children highlights significant societal concerns such as demographic shifts and economic strain. It underscores the importance of robust family support systems and the need for policies that address the intricate needs of multi-generational families.

This study explores these dynamics using a game-theoretic approach and data from the Survey of Health, Ageing and Retirement in Europe (SHARE) to test whether a relationship is evident between grandparents' childcare and future elder care provided by children to their parents. To do so, we begin by constructing a simple model of

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¹ See Zanasi et al. (2023) for a survey of studies.

intergenerational care provision within a family of three generations, which produces testable hypotheses regarding caregiving between generations. We then use SHARE data regarding the effect of childcare from grandparents on the likelihood of receiving help from children and the total time given by these children.

A significant body of literature has been dedicated to the understanding of the motives for caregiving, proposing and empirically testing different family transfer models. Klimaviciute and Pestieau (2023) identified three main motivations that have most often been examined in the literature. The standard motive for caregiving is altruism (Becker, 1974). Individuals would help family members out of concern for their relatives' well-being, without any expectations of reward. Altruism leads parents to provide more to their less well-off children and implies that children will care for their dependent parents, regardless of the time required. However, altruism is not the only possible motive for caregiving, and the solidarity between generations is also often based on social (family) norms or strategic considerations. Family norms operate as invisible constraints on family members' behaviour including caring for children and dependent parents (Canta and Pestieau, 2013). One strand of the literature has also stressed the importance of the transactional motive that involves taking action to help others with the expectation that they will offer help in return (Bernheim et al., 1985; Cigno, 1993; Cigno et al., 1998; Cox, 1987).

Several studies have empirically examined the motivations for family caregiving.² The majority of studies have rejected strictly altruistic motivations (Cigno et al., 1998; McGarry, 2000); however, these studies have often examined money transfers rather than time dedicated to family members' care. Some research has attempted to discriminate between altruistic and exchange motives by including time transfers from children to parents (Altonji et al., 2000; Alessie et al., 2014; Schoeni, 1997; Sloan et al., 2002). The results have been mixed. While some studies found no evidence in favour of an exchange motive, Alessie et al. (2014) determined that exchange motives might (partially) explain transfers between family members. Finally, Klimaviciute et al. (2017) investigated the three main motives together, demonstrating that the role of norms is far from being negligible. Previous research has not examined the caregiving cycle among grandparents, grandchildren and adult children, with the exception of Brugiavini et al. (2013), who revealed a positive relationship on other waves of the SHARE survey, without controlling for the dependence between the characteristics and decisions of adult children. The article highlights significant contemporary societal issues such as demographic shifts and economic strain, underscoring the importance of robust family support systems and the need for policies that address the intricate needs of multi-generational families.

The contributions of our study are twofold. First, we construct a theoretical framework, delineating a sub-game perfect Nash equilibrium model in which the grandparent first commits to caring for the grandchild, followed by the anticipation of receiving care from their adult child in the case of dependence. The model yields predictions for grandparents' decision to care and the probability of receiving help from adult children once long-term care (LTC) is needed, conditional on having cared for grandchildren. Second, we use SHARE data regarding the effect of grandparents' grandchild care on the level of care received from adult children in the case of dependence. By using the detailed SHARE data, we can relate each older individual to the help given and received from their adult children.

Our results reveal a positive and significant effect of grandparents' childcare for grandchildren on the likelihood of receiving help from adult children. This result remains robust to various alternative specifications and estimation models. Considering heterogeneity, we find that this positive effect is driven by countries from Southern and Eastern

Europe, where institutions and family norms favour the family as a primary caregiver. We also demonstrate substitutability within families with a lower probability of being helped by adult children when the older dependent grandparent still has a partner.

The remainder of this paper is structured as follows. Section 2 presents our theoretical models. Section 3 presents the SHARE data and sample construction, detailing descriptive statistics about both types of care. Section 4 outlines the estimation results, and Section 5 concludes.

2. Theoretical model

We consider two periods and a three-generation family, with a grandparent, parent (adult child) and grandchild. In the first period, the grandparent is ready to devote a portion of leisure time to care for the grandchild with the expectation that in case needs arise in the second period the adult child will provide care. The need for LTC may occur with probability π , which we assume to be constant among the elderly population.

In the first period, the parent works and the grandchild receives some attention (e) from the still-healthy grandparent and f from the parent. The grandparent benefits from a pension (p), enjoys leisure ($1 - e$) and purchases actuarially fair LTC insurance with a φ premium. The grandparent's first period utility is determined by employing a quasi-concave utility function ($h(p - \varphi, 1 - e)$). The parent consumes an income ($w(1 - f)$) and w is the wage rate. In the second period, when the grandparent becomes dependent, they require special care (m) that consists of formal LTC ($\frac{\varphi}{\pi}$) and informal care (a) provided by the adult child. In this case, the parent earns $(1 - a)w$.

In this setting, the parent and grandparent are altruistic and concerned about the utility of the grandchild, which is expressed by $\alpha v(e + f)$, where α measures the intensity of altruism that is supposed to be the same for the parent and grandparent.³ The utility of the grandparent is given as follows:

$$U_{gp} = h(p - \varphi, 1 - e) + \alpha v(f + e) + \beta \left[(1 - \pi)u(p) + \pi H(a + \frac{\varphi}{\pi}) \right] \quad (1)$$

where β is the time preference factor and the utility functions $v(\cdot)$, $u(\cdot)$ and $H(\cdot)$ are strictly concave. The utility of the parent is obtained as follows:

$$U_p = u(w(1 - f)) + \alpha v(f + e) + \beta [(1 - \pi)u(w) + \pi u(w(1 - a))] \quad (2)$$

Note that the parent and grandparent are connected by common altruism towards the grandchild in this specification and do not have any altruism towards one another. We assume that the parent is a Stackelberg leader and subsequently proceed in two stages and backward by first examining the grandparent's utility maximisation taking a as given, followed by that of the parent.

2.1. Grandparent's utility maximisation

The grandparent maximises utility with respect to e and φ and the interior first-order conditions (FOC) are as follows:

$$\frac{\partial U_{gp}}{\partial e} = -h_2(p - \varphi, 1 - e) + \alpha v'(f + e) = 0 \quad (3)$$

$$\frac{\partial U_{gp}}{\partial \varphi} = -h_1(p - \varphi, 1 - e) + \beta H'(a + \frac{\varphi}{\pi}) = 0 \quad (4)$$

where $h_1 = \frac{\partial h}{\partial e}$ and $h_2 = \frac{\partial h}{\partial \varphi}$. Combining these two FOCs, we obtain the following:

$$h_2 \beta H' - h_1 \alpha v' = 0 \quad (5)$$

³ Grandparents' altruism of the towards their own children may also be incorporated. In this case, the parent's utility should be introduced in the grandparent's utility in cases of a need or no need for LTC. This does not alter the results and establishes a positive relationship between e and a with $e'(a) > 0$.

² See Wolff and Laferrere (2006) and Klimaviciute et al. (2017) for a review of literature.

When $h_1 = h_2$, this equation would reduce to $\beta H' = \alpha v'$, implying that the marginal utility of LTC and that of childcare are equal. By implicit differentiation, we obtain the following:

$$[-h_{22}\beta H' - \alpha v''h_1 + h_{12}v']de + h_2\beta H''da = 0 \quad (6)$$

From this, we obtain the effect on e as follows:

$$e'(a) = \frac{h_2\beta H''}{h_{22}\beta H' + \alpha v''h_1 - h_{12}v'} \quad (7)$$

We can easily determine a sufficient condition for $e'(a) > 0$ is $h_{12} > 0$ in which informal and formal LTC are complementary.

2.2. Parent's utility maximisation

In the second stage of the game, the parent chooses a and f given $e'(a)$. The FOCs are obtained as follows:

$$\frac{\partial U_p}{\partial a} = \Delta = \alpha v'(f + e)e'(a) - \beta \pi u'(w(1 - a))w = 0 \quad (8)$$

$$\frac{\partial U_p}{\partial f} = \alpha v'(f + e) - u'(w(1 - f))w = 0 \quad (9)$$

Eq. (9) yields a relationship between f and e ; in fact, we have: $f = f(e, w, \alpha)$. We next use Eq. (8) to determine the expected impact of w, π, β, α on a .

2.3. Comparative statistics

By implicit differentiation of Eq. (8), we obtain the following:

$$da[\alpha v''e'(a) + \beta \pi u''w] - (d\beta + d\pi)u'w - \beta \pi u'dw + v'e'd\alpha = 0 \quad (10)$$

We can employ this equation to reveal the effects of π, w, p, β, α on e and a using the second-order conditions $\Delta' = \alpha v'e''(a) + \beta \pi u''w < 0$. Therefore, we have the following:

$$\frac{da}{d\beta} = \frac{da}{d\pi} = \frac{u'w}{\Delta'} < 0 \quad (11)$$

$$\frac{da}{dw} = \frac{u'\pi\beta}{\Delta'} < 0; \frac{da}{d\alpha} = \frac{v'e'}{\Delta'} > 0 \quad (12)$$

Therefore, e and a increase with the altruism parameter and decrease with wage rate (opportunity cost), the probability of disability and time preference. The grandparent's income has no effect on either e or a . In the empirical section that follows, we specifically examine the relationship between grandchild care and elder care. We explore the hypothesis that children's provision of assistance to disabled parents is motivated by the reciprocal care that grandparents previously provided for their grandchildren.⁴

2.4. Interpretation

We deliberately kept our theoretical model simple. By assuming identical individuals and abstracting from the possibility of more than one adult child or grandchild, we simplify the relationships involved. We also assume that the parent acts as the Stackelberg leader, although the reverse scenario, as suggested by Pestieau and Sato (2008), is also plausible. A key feature of this model is the introduction of two methods for financing the risk of the grandparent's dependence. The first method is standard LTC insurance, and the second method is a premium in Period 1 in the form of grandchild care (e) that results in aid in Period 2. Compared with standard LTC insurance, this family compact has an advantage and a disadvantage. The advantage is that the grandparent derives satisfaction from providing grandchild care. The disadvantage is that this compact operates within a non-

cooperative game framework. In a cooperative setting, we would have a corner solution with $a > 0$ if $w < 1$.

Notably, if the family operates according to the unitary model, maximising the combined utility of the grandparent and parent ($U_g + U_p$), the outcome will show that e and a are independent. This specific result is detailed in Appendix.

3. Data and sample

As noted previously, we use data from the SHARE; an international, interdisciplinary and longitudinal survey of people aged 50 and over. About 380,000 in-depth interviews with 140,000 people aged 50 or older from 28 European countries and Israel have been conducted. Every two years since 2004, questions relate to respondents' and their potential spouses' health status (objective and subjective) and households' economic and social circumstances, including relationships with children and close relatives.

3.1. Sample and descriptive statistics

This study uses the first two waves of SHARE to collect information on whether respondents declared that they cared for grandchildren at one point, which corresponds to Period 1 in our theoretical framework. We then relate this information to the probability of receiving care from their children when they require LTC a few years later in the sixth wave of the survey that represents Period 2. We restrict our analysis to the sixth wave because it is the last wave of the survey for which we can relate adult children's care to grandparents' past childcare. Our sample is composed of respondents for whom we have information on adult children that had children of their own to test our theory of reciprocity.

Our base sample includes adult child (the parent in our theoretical framework) respondents for whom accurate information about gender, marital status, employment status, education and number of children is available. The key variable in our analysis is whether the grandparent provided care for grandchildren in the first two waves of the survey (Period 1). We relate this variable to the probability of grandparents receiving help from their children a few years later (Period 2) in case a need for LTC arises. Therefore, we restrict our sample of analysis to individuals who present at least one limitation in activities of daily living (ADL) in Period 2 (wave six of SHARE). An individual is usually considered dependent (to have access to Medicaid benefits or APA allowance in France as examples) when they have two or more difficulties in performing the following ADLs: (1) dressing, including putting on shoes and socks; (2) walking across a room; (3) bathing or showering; (4) eating, such as cutting up your food; (5) getting in or out of bed; (6) using the toilet, including getting up or down. To increase the size of our sample, we deviate slightly from this threshold and consider respondents who reported at least one limitation. In further analysis we restrain this condition to two ADLs but it does not qualitatively affect our results, although it reduces the power of tests (Section 4.2).

Table 1 summarises the main characteristics of our sample. The data have 2760 parent/grandparent pairs that we can link the help given in Period 1 and the help received by the grandparent who has become dependent in Period 2. This corresponds to 1422 grandparents who were dependent in Period 2 and who had at least one grandchild in Period 1 for whom they could provide care, with 2643 parents of these grandchildren in our sample. This means that grandparents may appear more than once if they have several children with their own children. Similarly, a parent may appear twice if their parents (the grandparents) are still together; however, we observe almost none of these.

Our set of countries has differing institutions in addition to likely differences in terms of the role of families in intergenerational care. Our data cover 10 European countries that can be roughly divided into four groups based on LTC systems. As explained by Kools and Knoef (2019), in Northern European countries the government is primarily responsible for the provision of LTC, whereas, in contrast, families

⁴ As a grandparent can have multiple children, this represents the help in Period 2 that a grandparent receives from one child (*parent* in our models) for whom they provided childcare in Period 1.

Table 1
Descriptive statistics of the sample.

Grandparent		North	Centre	South	East	All
Grandchild in Period 1 (%)		30.3	38.8	27.2	27.0	32.0
Female (%)		61.5	59.7	64.4	54.5	61.0
Age (mean, s.d.)		78.1 (9.7)	78.6 (8.7)	81.2 (7.9)	76.6 (8.7)	79.2 (8.7)
In couple (%)		54.8	51.1	46.6	59.0	51.0
Wealth (1000€, mean, s.d.)		223.6 (301.6)	228.0 (295.4)	206.3 (293.0)	30.2 (36.2)	195.0 (283.5)
Self-perceived health	Very good/Excellent (%)	8.6	4.7	2.0	1.1	3.9
	Less than very good (%)	91.4	95.3	98.0	98.9	96.1
N		208	536	500	178	1422
Parent						
Grandparent care in Period 2 (%)		20.0	19.5	25.4	22.2	22.1
Female (%)		54.8	54.4	53.9	52.1	54.0
In couple (%)		69.0	75.7	87.9	79.6	76.6
Number of children (mean; s.d.)		2.21 (0.85)	2.13 (0.96)	2.37 (1.39)	2.1 (0.89)	2.23 (1.12)
Education	Low-ISCED [0;2]	17.5	14.5	42.8	24.1	26.5
	Medium-ISCED [3;4]	41.2	48.8	34.3	52.4	42.8
	High-ISCED [5;6]	41.3	36.7	22.9	23.5	30.7
Work status	Full employment	74.5	60.8	61.1	69.5	64.1
	Partial employment	5.5	11.2	5.5	1.2	7.0
	Inactive (retired, health issue or personal choice)	20.0	28.0	33.4	29.3	28.9
N		400	948	967	328	2643

have the main responsibility for providing care in Southern and Eastern countries. In central countries, the responsibility for LTC is shared between the government and families. We classify Denmark and Sweden as Northern countries; Austria, Belgium, France, Germany and Switzerland as Central countries; Greece, Israel, Italy and Spain as Southern countries; and Czech Republic and Poland as Eastern countries.

Table 1 reveals that women are over-represented among grandparents, particularly in the South, and the average age is 81.2 years. Just over 50% of grandparents still have a partner living in the same home. Unsurprisingly, dependent grandparents had low health assessments. Examining the children's sample, they are more often in couples in Southern Europe, with considerable differences in terms of work status and education across regions. The average number of children was greater than two (from 2.10 in the East to 2.37 in the South)⁵ in our sample.

The sample without grandparents' dependence condition in Period 2 is presented at Appendix (Table A.1, Figs. A.1 and A.2.). This second, larger sample on which robustness and heterogeneity tests are also conducted comprises 17 903 parent/grandparent pairs. Table 1 also presents the average proportion of grandparents who cared for grandchildren in Period 1 (32.0% for the whole sample) and the average proportion of adult children who cared for parents in Period 2 (22.1%). Table 2 summarises this information for each country separately. No particular North–South gradient appears in the distribution, even if grandparents in Central Europe seem *a priori* to be more present on the extensive margin (almost 39%).

Finally, Table 3 presents our two main variables of interest according to grandparents' and parents' characteristics and by country groups. Henceforth, the statistical tables and figures include grandparent/parent pairs with a sample size of 2760. As explained previously, a grandparent and a parent can potentially be present more than once. In the first panel, the 80+ age group took the least care of their grandchildren in Period 1 (only 17.6%), whereas they received the most attention in Period 2 (29.1%). Furthermore, in Period 1, grandparents (still) in couples were the most active in caring for grandchildren, while singles received the most help in Period 2. Looking at the second part of Table 3 reveals that Northern (38.6%) and Central (39.1%) European women received the most help from their parents in Period 1, while Southern European women supplied the most care to their parents in Period 2 (31%).

These findings are summarised in Figs. 1 and 2, presenting the percentage of help provided by parents in Period 2 based on having received help (or not) with childcare in the Period 1. We do not observe a higher percentage of conditional help in all cases, with the exception of the Southern European region and for single grandparents. Fig. 2 demonstrates the unique particularity in Germany. We present the empirical strategy for investigating this relationship in the next section.

3.2. Empirical strategy

We examine the effect of providing care for grandchildren from child j on receiving help from the adult child j once the grandparent (i) may need LTC. The unit of observation is whether respondents' adult children helped their parents. This means that we can observe several observations for a given SHARE respondent, if they have more than one adult child. To address this issue, we Refs. Alessie et al. (2014) and Klimaviciute et al. (2017), treating the dataset as a panel in which the cross-sectional dimension is given by grandparents, while the longitudinal outcome represents adult children (parents). By doing so, we can control for correlated, parent-specific effects by estimating the model with random effects as follows:

$$A_{i,j} = \beta_1 + \beta_2 E_{i,j} + X_i \beta_3 + M_{i,j} \beta_4 + v_i + \varepsilon_{i,j} \quad (13)$$

where $A_{i,j}$ indicates whether grandparent i received help from adult child j , and $E_{i,j}$ equals one if grandparent i cared for adult child j 's children, and zero otherwise. X_i and $M_{i,j}$ denote sets of control variables that are specific to grandparents and adult children, respectively. v_i is a parent-specific effect, and $\varepsilon_{i,j}$ represents idiosyncratic error terms.

Because grandparents' explanatory variables do not vary in our sample, we cannot employ a fixed effects (FE) approach; however, the random effects (RE) estimator assumes that the unobserved, grandparent-specific effect is uncorrelated with all explanatory variables, which is a strong assumption. An alternative solution is to estimate a correlated RE model, as proposed by Mundlak (1978), to estimate the effects of within-individual changes in the variables of interest. The grandparent-specific effect is expressed as a linear function of the average grandparent-varying explanatory variables across adult children, in addition to a random individual specific effect that we assume to be independent of the explanatory variables as follows:

$$v_i = \zeta_0 \bar{E}_i + \bar{M}_i \zeta_1 + \xi_i$$

where $\bar{E}_i$ and $\bar{M}_i$ are the individual means of $E_{i,j}$, and $M_{i,j}$. ξ is i.i.d. normally distributed with a mean of zero and a variance of σ_ξ^2 . Eq. (13)

⁵ 22.9% have 1 child, 46.6% two and 30.5% 3 or more.

Table 2
Grandchild care in Period 1 and grandparent care in Period 2 w.r.t countries.

		Grandparent		Parent	
		Grandchild care in Period 1 (%)		Grandparent care in Period 2 (%)	
		Mean	s.d.	Mean	s.d.
North		30.3	(46.1)	20.0	(40.0)
	Denmark	32.6	(47.1)	24.9	(43.3)
	Sweden	28.4	(45.3)	16.1	(36.9)
Centre		38.8	(48.8)	19.4	(39.6)
	Austria	22.6	(42.2)	27.0	(44.6)
	Belgium	41.2	(49.3)	16.8	(37.4)
	France	43.5	(49.7)	16.7	(37.3)
	Germany	38.3	(48.9)	27.8	(45.0)
	Switzerland	34.3	(48.2)	20.0	(40.3)
South		27.2	(44.5)	25.3	(43.5)
	Greece	31.5	(46.7)	39.5	(49.1)
	Israel	17.1	(37.8)	17.6	(38.1)
	Italy	42.1	(49.6)	22.9	(42.1)
	Spain	20.2	(40.3)	28.6	(45.2)
East		27.0	(44.5)	22.6	(41.5)
	Czech Republic	20.5	(40.7)	37.9	(48.7)
	Poland	31.4	(46.6)	12.2	(32.9)
All		32.0	(46.6)	22.1	(41.5)
N		1422		2643	

Table 3
Grandchild care in Period 1 and grandparent care in Period 2 w.r.t main covariates.

Grandparent's characteristics		Grandchild care in Period 1 (%)					Grandparent care in Period 2 (%)				
		North	Centre	South	East	All	North	Centre	South	East	All
Sex	Female	35.3	32.4	25.5	23.4	29.2	22.5	21.8	25.4	20.8	23.2
	Male	36.0	41.5	22.8	25.0	32.1	16.0	16.2	25.3	24.3	20.4
Age	Less than 70	49.5	66.9	40.5	36.6	50.7	9.7	11.3	8.3	12.2	10.5
	70–80	48.8	47.8	36.5	30.6	42.0	8.7	14.2	19.6	19.8	15.9
	80+	19.7	19.6	16.7	12.2	17.6	33.0	25.7	30.4	29.9	29.1
In couple	Yes	44.0	46.4	31.8	31.4	39.0	10.0	13.1	21.1	20.1	16.3
	No	25.8	25.6	18.6	14.4	21.6	31.6	26.2	28.9	25.3	27.9
Wealth	1st tercile	27.2	27.1	19.5	17.9	23.3	25.5	23.8	19.7	24.6	22.9
	2nd tercile	46.5	41.3	25.8	35.1	35.4	15.1	17.1	33.8	22.3	23.7
	3rd tercile	48.6	49.5	32.3	27.5	39.9	8.6	13.7	25.6	13.7	18.2
<i>Parent's characteristics</i>											
Sex	Female	38.6	39.1	25.0	23.4	32.0	22.4	21.9	31.0	26.3	25.8
	Male	31.9	32.5	24.1	24.8	28.3	17.3	16.7	19.0	18.2	17.9
In couple	Yes	35.7	35.6	24.9	23.2	29.8	21.2	20.2	26.7	22.8	23.3
	No	35.2	37.4	22.0	27.9	32.4	17.6	17.7	15.4	20.6	17.5
Education	Low	34.3	25.9	19.9	12.0	21.6	11.4	20.4	27.0	37.3	25.4
	Medium	36.7	32.4	29.8	24.9	31.1	18.7	21.7	23.4	15.8	20.9
	High	34.9	45.0	25.6	35.0	36.8	25.0	16.5	25.2	21.2	21.0
Number of children	1	20.8	36.2	27.4	25.9	30.0	18.2	20.6	29.8	21.0	23.5
	2	39.7	34.4	27.4	21.1	31.0	24.1	20.0	28.7	23.5	24.2
	3 or +	37.9	38.5	18.7	28.0	29.4	15.1	18.0	17.8	21.5	17.9
Employment status	Full time	41.1	45.5	26.0	26.9	35.4	17.4	16.1	23.3	20.6	19.5
	Part time	43.5	38.1	22.2	50.0	34.5	21.7	26.5	27.8	25.0	26.3
	Inactive	12.3	14.7	22.2	16.3	17.9	29.6	24.3	28.8	26.6	27.0
N		408	999	1013	340	2760	408	999	1013	340	2760

can then be rewritten as follows:

$$A_{i,j} = \beta_1 + \beta_2 E_{i,j} + X_i \beta_3 + M_{i,j} \beta_4 + \zeta_0 \bar{E}_i + \bar{M}_i \zeta_1 + \xi_i + \varepsilon_{i,j}$$

As our dependent variable is binary, we estimate linear probability (LPM) and probit models. To control for the correlation of errors and regressors within grandparent observations, we estimate the models using standard errors clustered at the grandparent level, which allows us to account for potential dependence between observations and ensures that the analysis is robust to heteroscedasticity. In X_i , we include grandparent characteristics such as sex ($Female_i$), age (Age_i), whether the grandparent is in a couple ($In\ couple_i$), wealth expressed in terciles ($Low\ wealth_i$, $Medium\ wealth_i$) and whether the grandparent indicated less than very good health ($Bad\ health_i$). For adult children characteristics, we consider sex ($Female_j$), education ($Low\ Education_j$, $Medium\ Education_j$), the number of grandchildren ($\#\ children_j$) and a series of dummies for marital status (married and living together with a spouse, registered partnership, married and living separately

from a spouse, never married, divorced or widowed) and occupational status (full-time employed, part-time employed, self-employed or working for own family business, unemployed, in vocational training/retraining/education, parental leave, in retirement or early retirement, permanently sick or disabled, looking after home or family and other). We might have also included the grandchild's distance; however, this is highly correlated with our variable of interest, which is a dummy to determine whether the grandparent cared for grandchildren. In the robustness section (Section 4.2.), we examine whether our results are affected when we interact all our explanatory variables with a variable indicating distance.

4. Empirical results

Following our empirical strategy, we estimate the effect of grandchildren's caregiving on the probability of being helped by adult children (parents). We compare RE and correlated RE (CRE) models,

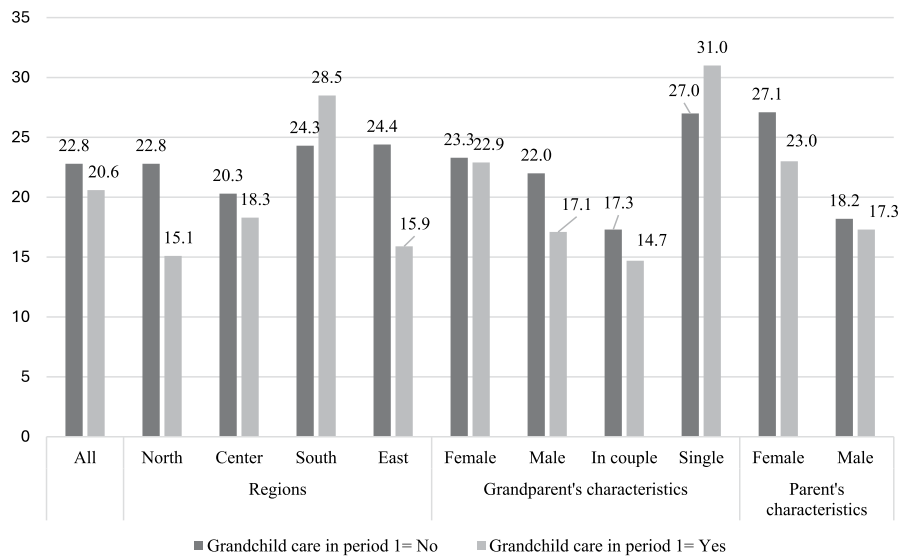


Fig. 1. Grandparent care in Period 2 w.r.t grandchild care in Period 1 (%).

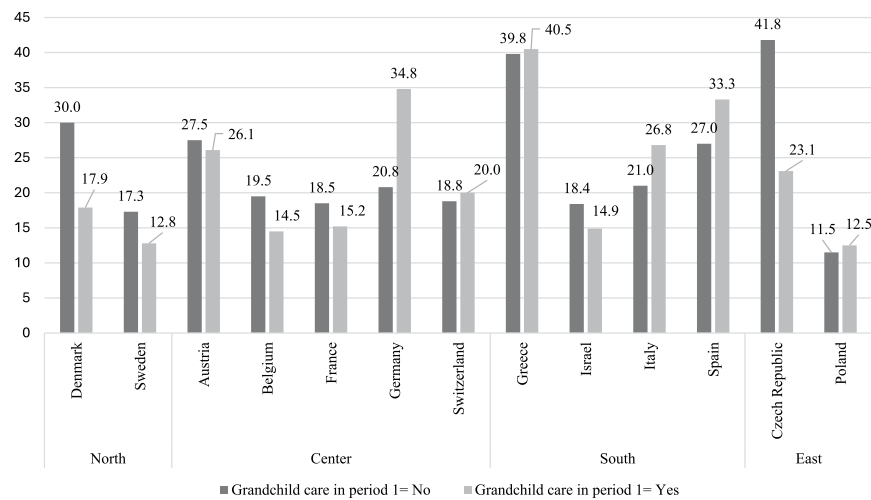


Fig. 2. Grandparent care in Period 2 w.r.t grandchild care in Period 1 (%) by countries.

estimating LPM and probit models since the dependent variable is binary. In the latter case, we report marginal effects.

4.1. Baseline estimation

Table 4 presents the baseline estimation using our total sample with the dependence condition for the grandparent in Period 2. In the next sub-section, we present heterogeneity and sensitivity analyses. Estimated coefficients of the CRE model do not statistically differ from those estimated using the RE model. The results are highly similar, regardless of whether we estimate the model using ordinary least squares or a probit model. Overall, the effect of caring for grandchildren is positive and significant at the 5% level concerning the likelihood of receiving help from children. These results confirm the validity of our theoretical model predicting the intergenerational exchange of help.

Considering the other variables, the results confirm that elderly grandparents are more likely to receive help from their child when they have a partner. Substitutability is evident in help between partners and adult children, which we explore below when examining the interactive effects introducing marital status. Although we condition our sample estimation on having at least one ADL, we also consider the self-perceived health status, which is correlated with the probability of receiving informal care, as expected. Finally, being a female appears to increase

the likelihood of providing care in the second Period. We explore the gender difference more closely in the heterogeneity analysis.

4.2. Heterogeneity and sensitivity analysis

We next conduct a series of additional estimations to verify the robustness of our results and heterogeneous effects. Since the results from different estimations are extremely similar (as shown in Table 4), we only present the CRE LPM.⁶ Table 5 presents the results for our variable of interest. Complete results are available in Appendix (Tables A.2–A.6).

First, we examine variations between countries. In Table 5, we interact all variables in the baseline model with North, Central, South and Eastern European country groups. Unfortunately, the results observed in the first panel of Table 4 on the effect of taking care of grandchildren only holds marginally in Southern and Eastern countries in Europe, suggesting that specific family arrangements in these countries drive our results. Previous studies, the role of family norms has been demonstrated as one of the main motives for children's assistance (Canta and

⁶ The results for other estimations are similar and are available upon request.

Table 4
Estimation results.

	Random effects		Correlated random effects	
	LPM (1)	Probit (2)	LPM (3)	Probit (4)
Grandchild care ($E_{i,j}$)	0.040** (0.016)	0.047*** (0.018)	0.054** (0.022)	0.060** (0.024)
Parent characteristics				
Female _j	0.082*** (0.016)	0.085*** (0.016)	0.084*** (0.020)	0.086*** (0.020)
Low Education _j	−0.006 (0.024)	−0.006 (0.023)	−0.012 (0.034)	−0.010 (0.033)
Medium Education _j	0.000 (0.018)	−0.005 (0.019)	0.007 (0.025)	0.003 (0.026)
#Children _j	−0.019** (0.007)	−0.020*** (0.008)	−0.016 (0.011)	−0.015 (0.011)
Grandparent characteristics				
Female _i	−0.005 (0.020)	−0.007 (0.021)	−0.005 (0.020)	−0.006 (0.021)
In couple _i	−0.067*** (0.022)	−0.075*** (0.022)	−0.070*** (0.022)	−0.077*** (0.023)
Age _i	0.007*** (0.001)	0.008*** (0.001)	0.007*** (0.001)	0.008*** (0.001)
Low wealth _i	0.013 (0.025)	0.018 (0.026)	0.015 (0.025)	0.021 (0.026)
Medium wealth _i	0.041 (0.026)	0.042 (0.028)	0.043* (0.026)	0.044 (0.028)
Bad health _i	0.133*** (0.035)	0.188*** (0.062)	0.129*** (0.035)	0.187*** (0.061)
N	2760	2760	2760	2760

Notes: Standard errors clustered at the individual level are reported in parentheses. All specifications contain country FEs and a series of dummies for marital status taking widowed as a reference (married and living with a spouse, registered partnership, married and living separately from a spouse, never married or divorced) and the occupational status of the parent taking other as a reference (full-time employed, part-time employed, self-employed or working for own family business, unemployed, in vocational training/retraining/education, parental leave, in retirement or early retirement, permanently sick or disabled or looking after home or family). Probit results reveal marginal effects estimated at the mean.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Pestieau, 2013; Leroux and Pestieau, 2014) and the effect of filial norms on help provision by children is more prescriptive in the South and the East than in the North (Canta et al., 2016).

As shown in Table 4, grandparents with a partner at home reduces the likelihood of receiving help from children. We then interact all variables with having a partner or not. The second panel of Table 5 indicates that single grandparents primarily drive our baseline results. This is a noteworthy result as it confirms our previous empirical observation of substitutability between informal care provided by a partner and children (Bolin et al., 2008). As long as a partner is alive, they are most often the informal caregiver, while adult children assume the primary responsibility for assisting single living parents.

We also conduct two tests to consider gender differences. First we examine the gender of elderly parents receiving help. We then explore the gender of the adult child providing LTC. We first observe a significant reciprocity effect for older women receiving help but no significant effect for men; however this result is correlated with the presence of a partner since 81.9% of men in our sample live with a partner but only 52.4% of women. Women are also older than men on average but no significant difference emerges when we estimate our model using different age groups. Considering the gender of adult children reveals that daughters drive the results. This is unsurprising since we previously determine that women are the main LTC providers. Reciprocity could be one of the motivations but this is not so for men.

Distance from children is likely to affect the possibility of reciprocity. Therefore, we estimate the same model, interacting the explanatory variables with distance. We define children living close to

Table 5
Heterogeneity and sensitivity analysis.

	By country groups			
	North	Centre	South	East
Grandchild care ($E_{i,j}$)	0.036 (0.064) 408	0.031 (0.020) 999	0.058 (0.045) 1013	0.117* (0.065) 340
By Grandparent characteristics				
	Presence of a partner		Sex	
	Single	In couple	Men	Women
Grandchild care ($E_{i,j}$)	0.048** (0.024)	0.048 (0.041)	0.039 (0.034)	0.064** (0.028)
N	1387	1373	1040	1720
By Parent characteristics				
	Distance		Sex	
	Close	Far	Men	Women
Grandchild care ($E_{i,j}$)	−0.019 (0.035)	0.091*** (0.033)	0.032 (0.032)	0.059*** (0.018)
N	1252	1508	1283	1477
Different samples				
	Two ADL	No ADL	All	
Grandchild care ($E_{i,j}$)	0.058* (0.035)	0.030*** (0.007)	0.033*** (0.007)	
N	1454	15 143	17 903	
Intensity				
	RE		CRE	
Less often	0.005 (0.024)	0.022 (0.027)		
Almost every month	0.035 (0.030)	0.051 (0.034)		
Almost every week	0.051* (0.027)	0.064** (0.031)		
Almost daily	0.089*** (0.033)	0.104*** (0.035)		
N	2760	2760		

Standard errors clustered at the individual level are reported in parentheses. All specifications contain the same covariates as in Table 4 as well as country FEs and a series of dummies for marital status taking widowed as a reference (married and living with a spouse, registered partnership, married and living separately from a spouse, never married or divorced) and the occupational status of the parent taking other as a reference (full-time employed, part-time employed, self-employed or working for own family business, unemployed, in vocational training/retraining/education, parental leave, in retirement or early retirement, permanently sick or disabled, looking after home or family).

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

their parents if they live less than 5 kilometres away, and far if they live more than 5 kilometres away. Interestingly, the main results are driven by those who live far away from their parents. It may be the case that when adult children receive childcare help from parents that live far away, they feel more obligated to reciprocate.

We also test the robustness of our results on different samples. All our estimations are based on two main conditions—not needing LTC when taking care of grandchildren but needing it in the Period of observations. We successively relax these conditions to determine whether the hypothesis of intergenerational care transfer holds, regardless of the needs. We also examine the effect of taking a more conservative condition of dependence and consider having two or more limitations.⁷ In Table 5, all specifications demonstrate significant effects concerning our variable of interest, confirming our theoretical predictions.

Finally, we consider the intensive margin of grandparents' childcare. Thus far, we only examine whether grandparents cared for grandchildren; however, the positive effect observed may also be dependent on

⁷ A person is usually considered dependent if they have two or more ADL limitations.

the intensity of this help (i.e. how often they took care of grandchildren). The SHARE data include information on how often grandparents cared for their grandchildren, covering almost daily (8.6%), almost every week (12.9%), almost every month (8.5%) and less often (13.5%), where 69% of our sample did not provide grandchild care. Therefore, we examine whether variation according to childcare intensity is evident. In the last panel of Table 5, we present the results for RE and CRE for the LPM, where the reference is the absence of grandchild care. The results reveal that the probability of receiving care from the parents depends on the intensity of care provided for grandchildren. Only those who took care of grandchildren on a regular basis exhibit a significant (or marginally significant) effect.

5. Conclusion

The dynamics of caregiving within families often encompass both grandchild care and caring for grandparents. These roles are intergenerational and multifaceted, involving emotional, physical and financial factors. The benefits of both forms of care are evident, and encouraging such caregiving practices is essential, provided they do not jeopardise the caregiver's health.

A critical question often raised about these caregiving roles concerns the underlying motivations. Traditionally, families have been considered as cooperative units driven by altruistic motives. However, this perspective has been challenged and an alternative approach suggests that caregiving is motivated by a transactional exchange rather than pure altruism (Cox, 1987; Cigno et al., 1998). This study adopts this exchange-based perspective, developing a non-cooperative sub-game perfect Nash equilibrium model, where the parent acts as the Stackelberg leader and the grandparent is the follower. With this model, we examine the relationship between the care provided by grandparents and the care they receive in return.

We investigate this hypothesis using SHARE data from 10 European countries. These data include information on the care provided to grandchildren by healthy grandparents and the care these grandparents later received from adult children in cases of disability. Our primary finding is that grandchild care indeed fosters elder care. We also demonstrate that the relationship between these two types of care is robust to alternative specifications and caregiving intensity is a relevant consideration. In addition, we demonstrate that outcomes vary across countries with a sharp contrast between Southern Europe and the other countries.

The policy implications of our findings are significant. Government and non-profit programmes can offer financial assistance, caregiver support and resources to help navigate caregiving responsibilities. Policies that support paid family leave and flexible work arrangements to benefit those balancing caregiving roles should be promoted.

In conclusion, caregiving for grandchildren and grandparents involves a complex interplay of benefits and challenges. Strong family communication, community support and the appropriate use of resources can enhance the well-being of all involved. Future research on the determinants of informal care should focus on understanding the interplay between socio-demographic, economic, cultural, and health-related factors that influence caregiving dynamics. Special attention should be given to the impact of evolving family structures and intergenerational relationships on caregiving responsibilities.

CRedit authorship contribution statement

Mathieu Lefebvre: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Roles/Writing – original draft, Writing – review & editing. **Pierre Pestieau:** Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Roles/Writing – original draft, Writing –

review & editing. **Jérôme Schoenmaeckers:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualisation, Roles/Writing – original draft, Writing – review & editing.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix. Unitary model of family

If the family operates according to the unitary model, it amounts to maximise $U_g + U_p$, namely

$$\mathcal{L} = h(p - \varphi, 1 - e) + u(w(1 - f)) + \alpha v(f + e) + \beta \left[(1 - \pi)u(w) + \pi u(w(1 - a)) + (1 - \pi)u(p) + \pi H\left(a + \frac{\varphi}{\pi}\right) \right]$$

FOCs with respect to e , f and a are as follows:

$$-h_2 + \alpha v'(f + e) = 0; -u'(w(1 - a))w + H'(a + \frac{\varphi}{\pi}) = 0;$$

$$-u'(w(1 - f))w + \alpha v'(f + e) = 0.$$

Table A.1
Sample statistics without dependence condition in Period 2.

<i>Grandparent</i>		North	Centre	South	East	All
Grandchild care in Period 1 (%)		51.0	54.4	44.7	35.9	47.7
Female (%)		58.0	59.1	60.7	60.5	59.6
Age (mean; s.d.)		74.0 (8.2)	74.2 (8.4)	75.2 (8.1)	71.1 (8.0)	74.0 (8.3)
In couple (%)		66.8	65.6	68.8	66.3	67.0
Wealth (1000 euros, mean; s.d.)		332.6 (409.5)	339.5 (459.7)	239.7 (353.1)	46.7 (50.1)	261.6 (390.6)
Self-perceived health	Very good/Excellent (%)	40.7	19.7	15.7	9.8	21.0
	Less than very good (%)	59.3	80.3	84.3	90.2	79.0
At least one ADL limitation (%)		10.7	17.1	14.7	12.4	14.4
N		1943	1704	1515	1433	9895
<i>Parent</i>		North	Centre	South	East	All
Grandparent care in Period 2 (%)		12.0	11.0	11.9	15.5	12.2
Female (%)		52.2	54.9	53.1	54.2	53.6
In couple (%)		73.0	75.1	89.0	81.1	80.4
Number of children (mean; s.d.)		2.31 (0.97)	2.15 (1.00)	2.30 (1.35)	2.04 (0.82)	2.21 (1.11)
Education	Low - ISCED [0;2]	12.7	10.1	33.3	22.1	20.4
	Medium - ISCED [3;4]	41.8	45.2	35.8	54.2	42.5
	High - ISCED [5;6]	45.5	44.7	30.9	23.7	37.1
Work status	Full employment	81.1	67.0	68.6	80.3	72.3
	Partial employment	6.4	14.3	6.3	1.2	8.0
	Inactive	12.5	18.7	25.1	18.5	19.7
N		2749	4171	4719	1927	13 566

Table A.2
Estimations by group of countries.

	North	Centre	South	East
<i>Grandchild care ($E_{i,j}$)</i>	0.036 (0.064)	0.031 (0.020)	0.058 (0.045)	0.117* (0.065)
Parent characteristics				
<i>Female_j</i>	0.039 (0.051)	0.015 (0.027)	0.139*** (0.037)	0.173*** (0.065)
<i>Low Education_j</i>	0.048 (0.080)	-0.004 (0.045)	-0.067 (0.055)	-0.105 (0.118)
<i>Medium Education_j</i>	0.007 (0.063)	0.049 (0.034)	-0.041 (0.046)	-0.054 (0.099)
<i>Children_j</i>	-0.015 (0.022)	-0.006 (0.014)	-0.022 (0.018)	-0.008 (0.033)
Grandparent characteristics				
<i>Female_i</i>	0.029 (0.046)	0.025 (0.032)	-0.025 (0.040)	-0.059 (0.055)
<i>In couple_i</i>	-0.140*** (0.054)	-0.063 (0.040)	-0.053 (0.042)	-0.001 (0.060)
<i>Age_i</i>	0.003 (0.003)	0.006*** (0.002)	0.009*** (0.002)	0.004 (0.004)
<i>Low wealth_i</i>	0.105* (0.057)	0.070 (0.046)	-0.072* (0.041)	0.072 (0.081)
<i>Medium wealth_i</i>	0.012 (0.053)	0.029 (0.042)	0.062 (0.048)	0.061 (0.083)
<i>Bad health_i</i>	0.118* (0.062)	0.122** (0.060)	0.121 (0.078)	-0.295 (0.304)
N	408	999	1013	340

Standard errors clustered at the individual level are reported in parentheses. All specifications contain the same covariates as in Table 4 as well as country FEs and a series of dummies for marital status taking widowed as reference (married and living with a spouse, registered partnership, married and living separately from a spouse, never married or divorced) and the occupational status of the parent taking other as reference (full-time employed, part-time employed, self-employed or working for own family business, unemployed, in vocational training/retraining/education, parental leave, in retirement or early retirement, permanently sick or disabled, looking after home or family).

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table A.3
Estimations by marital status and sex of the grandparents.

	(1) Single	(2) With partner	(3) Men	(4) Women
<i>Grandchild care ($E_{i,j}$)</i>	0.048 (0.041)	0.048** (0.024)	0.039 (0.034)	0.064** (0.028)
Parent characteristics				
<i>Female_j</i>	0.106*** (0.032)	0.063*** (0.022)	0.065** (0.028)	0.091*** (0.026)
<i>Low Education_j</i>	-0.078 (0.052)	0.066 (0.041)	-0.051 (0.056)	-0.003 (0.042)
<i>Medium Education_j</i>	0.001 (0.046)	0.011 (0.022)	0.014 (0.034)	-0.001 (0.035)
<i>Children_j</i>	-0.017 (0.016)	-0.012 (0.011)	-0.029** (0.013)	-0.010 (0.015)
Grandparent characteristics				
<i>Female_i</i>	0.032 (0.036)	-0.018 (0.024)		
<i>In couple_i</i>			-0.036 (0.038)	-0.100*** (0.029)
<i>Age_i</i>	0.006*** (0.002)	0.009*** (0.002)	0.007*** (0.002)	0.007*** (0.002)
<i>Low wealth_i</i>	0.016 (0.043)	0.009 (0.033)	0.033 (0.039)	0.013 (0.033)
<i>Medium wealth_i</i>	0.051 (0.047)	0.037 (0.031)	0.044 (0.041)	0.047 (0.034)
<i>Bad health_i</i>	0.231*** (0.064)	0.081* (0.044)	0.106** (0.051)	0.143*** (0.050)
N	1387	1373	1040	1720

Standard errors clustered at the individual level are reported in parentheses. All specifications contain the same covariates as in Table 4 as well as country FEs and a series of dummies for marital status taking widowed as reference (married and living with a spouse, registered partnership, married and living separately from a spouse, never married or divorced) and the occupational status of the parent taking other as reference (full-time employed, part-time employed, self-employed or working for own family business, unemployed, in vocational training/retraining/education, parental leave, in retirement or early retirement, permanently sick or disabled or looking after home or family).

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

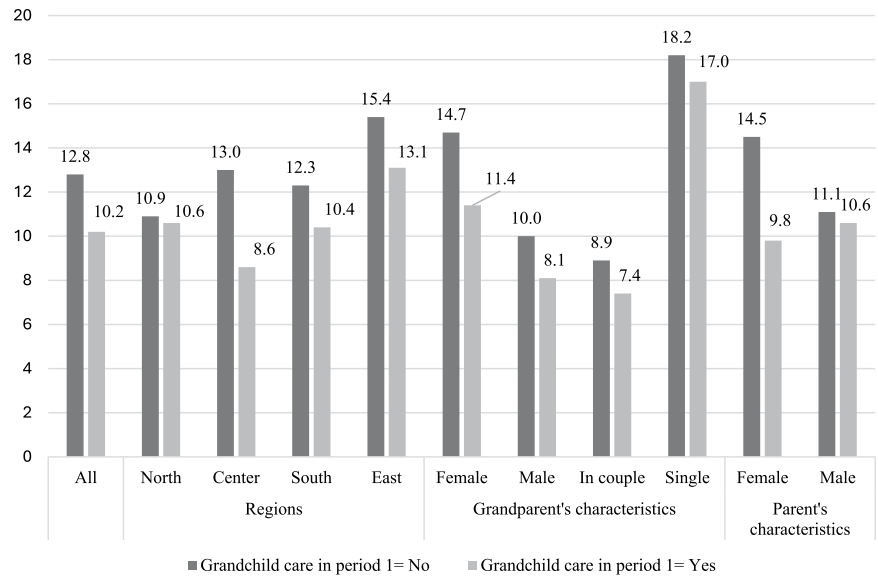


Fig. A.1. Grandparent care in Period 2 w.r.t grandchild care in Period 1 (%; without dependence condition).

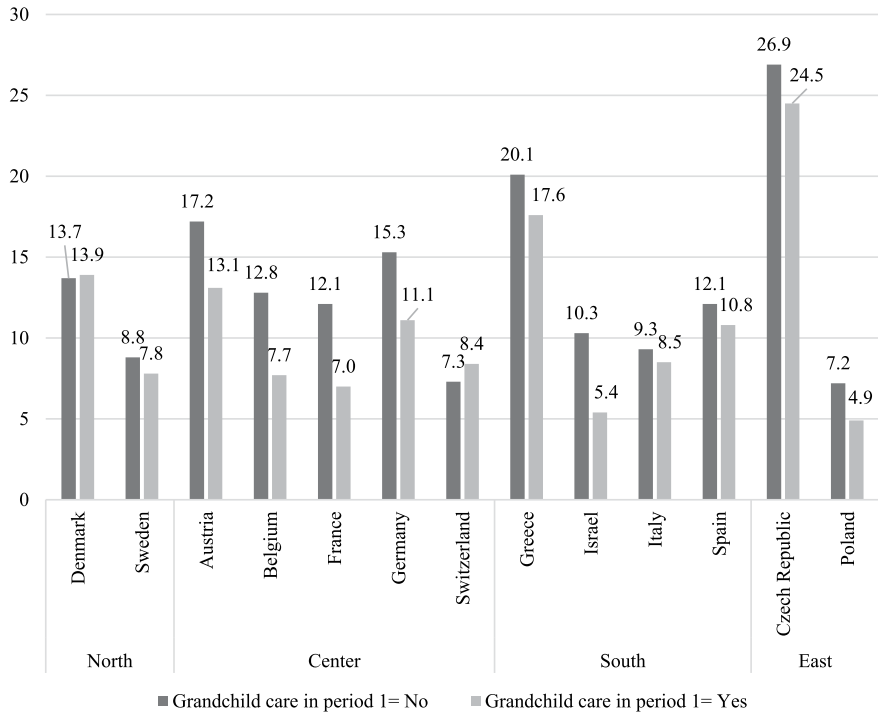


Fig. A.2. Grandparent care in Period 2 w.r.t grandchild care in Period 1 by countries (%; without dependence condition).

In this case, no relationship is evident between e and a . Obtaining such a relationship requires introducing a link between the two periods through φ .

Additional tables

See Tables A.1–A.6.

Additional figures

See Figs. A.1 and A.2.

Data availability

STATA codes to replicate results are freely available at <https://data.mendeley.com/datasets/kxv5vy77t4/2>. The raw data of the Survey of Health, Ageing and Retirement in Europe (SHARE) to run these programs can be downloaded on the website of SHARE-ERIC: <https://share-eric.eu/data>.

Table A.4
Estimations by distance and sex of the parents.

	(1) Close	(2) Far	(3) Men	(4) Women
Grandchild care ($E_{i,j}$)	-0.019 (0.035)	0.091*** (0.033)	0.032 (0.032)	0.059*** (0.018)
Parent characteristics				
<i>Female_j</i>	0.095*** (0.034)	0.082*** (0.027)		
<i>Low Education_j</i>	0.011 (0.057)	-0.007 (0.044)	0.030 (0.049)	-0.047 (0.057)
<i>Medium Education_j</i>	0.013 (0.047)	-0.011 (0.033)	0.068* (0.040)	-0.023 (0.043)
<i>Children_j</i>	-0.003 (0.016)	-0.028** (0.012)	-0.022 (0.015)	-0.013 (0.014)
Grandparent characteristics				
<i>Female_i</i>	0.010 (0.031)	-0.017 (0.023)	0.000 (0.025)	-0.010 (0.027)
<i>In couple_i</i>	-0.078** (0.034)	-0.055** (0.027)	-0.082*** (0.029)	-0.062** (0.030)
<i>Age_i</i>	0.007*** (0.002)	0.008*** (0.001)	0.004*** (0.002)	0.010*** (0.002)
<i>Low wealth_i</i>	0.021 (0.038)	0.030 (0.030)	-0.052 (0.033)	0.061* (0.033)
<i>Medium wealth_i</i>	0.056 (0.039)	0.044 (0.030)	-0.025 (0.034)	0.079** (0.034)
<i>Bad health_i</i>	0.111* (0.063)	0.121*** (0.043)	0.076 (0.057)	0.147*** (0.042)
<i>N</i>	1252	1508	1283	1477

Standard errors clustered at the individual level are reported in parentheses. All specifications contain the same covariates as in Table 4 as well as country FEs and a series of dummies for marital status taking widowed as reference (married and living with a spouse, registered partnership, married and living separately from a spouse, never married or divorced) and the occupational status of the parent taking other as reference (full-time employed, part-time employed, self-employed or working for own family business, unemployed, in vocational training/retraining/education, parental leave, in retirement or early retirement, permanently sick or disabled or looking after home or family).

* $p < 0.1$

** $p < 0.05$

*** $p < 0.01$.

Table A.5
Estimations for different samples.

	(1) Two ADL	(2) No ADL	(3) All
Grandchild care ($E_{i,j}$)	0.058* (0.035)	0.030*** (0.007)	0.033*** (0.007)
Parent characteristics			
<i>Female_j</i>	0.107*** (0.028)	0.021*** (0.006)	0.031*** (0.006)
<i>Low Education_j</i>	0.007 (0.049)	0.001 (0.013)	-0.000 (0.012)
<i>Medium Education_j</i>	0.024 (0.037)	0.013 (0.008)	0.012 (0.008)
<i>Children_j</i>	-0.008 (0.014)	-0.005 (0.003)	-0.006** (0.003)
Grandparent characteristics			
<i>Female_i</i>	-0.058* (0.032)	0.027*** (0.006)	0.024*** (0.006)
<i>In couple_i</i>	-0.082** (0.033)	-0.039*** (0.007)	-0.049*** (0.007)
<i>Age_i</i>	0.007*** (0.002)	0.004*** (0.000)	0.005*** (0.000)
<i>Low wealth_i</i>	0.003 (0.038)	0.011 (0.007)	0.012* (0.007)
<i>Medium wealth_i</i>	0.090** (0.043)	0.001 (0.006)	0.005 (0.006)
<i>Bad health_i</i>	0.216*** (0.084)	0.031*** (0.006)	0.043*** (0.006)
<i>N</i>	1454	15 143	17 903

Standard errors clustered at the individual level are reported in parentheses. All specifications contain the same covariates as in Table 4 as well as country FEs and a series of dummies for marital status taking widowed as reference (married and living with a spouse, registered partnership, married and living separately from a spouse, never married or divorced) and the occupational status of the parent taking other as reference (full-time employed, part-time employed, self-employed or working for own family business, unemployed, in vocational training/retraining/education, parental leave, in retirement or early retirement, permanently sick or disabled or looking after home or family).

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table A.6
Intensity.

	(1) RE	(2) CRE
Less often	0.005 (0.024)	0.022 (0.027)
Almost every month	0.035 (0.030)	0.051 (0.034)
Almost every week	0.051* (0.027)	0.064** (0.031)
Almost daily	0.089*** (0.033)	0.104*** (0.035)
Parent characteristics		
<i>Female_j</i>	0.080*** (0.016)	0.083*** (0.020)
<i>Low Education_j</i>	−0.006 (0.024)	−0.011 (0.034)
<i>Medium Education_j</i>	−0.000 (0.018)	0.006 (0.025)
<i>Children_j</i>	−0.018** (0.007)	−0.016 (0.011)
Grandparent characteristics		
<i>Female_i</i>	−0.008 (0.020)	−0.007 (0.020)
<i>In couple_i</i>	−0.066*** (0.022)	−0.070*** (0.022)
<i>Age_i</i>	0.007*** (0.001)	0.007*** (0.001)
<i>Low wealth_i</i>	0.015 (0.025)	0.017 (0.025)
<i>Medium wealth_i</i>	0.042 (0.026)	0.044* (0.026)
<i>Bad health_i</i>	0.130*** (0.035)	0.126*** (0.036)
<i>N</i>	2760	2760

Standard errors clustered at the individual level are reported in parentheses. All specifications contain the same covariates as in Table 4 as well as country FEs and a series of dummies for marital status taking widowed as reference (married and living with a spouse, registered partnership, married and living separately from a spouse, never married or divorced) and the occupational status of the parent taking other as reference (full-time employed, part-time employed, self-employed or working for own family business, unemployed, in vocational training/retraining/education, parental leave, in retirement or early retirement, permanently sick or disabled or looking after home or family).

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

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