Grandfather and grandson

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VERY PRELIMINARY AND INCOMPLETE

Abstract.

Grandparents often provide extensive grandchild caring. In this paper I wander whether this activity is beneficial or detrimental to grandparents' physical and mental health. I have estimated a difference-in-differences model to compare the trends in a battery of health outcomes between two groups of grandparents, those who did not provide childcare in three consecutive periods and those who looked after their grandchildren in the third period but not in the first two periods. Results suggest significant beneficial effects of providing childcare on a small number of health outcomes, the remaining being unaffected. A test to assess the validity of the underlying common trend hypothesis, crucial to identification, is also performed.

Introduction

The arrival of a child turns around parents' life but, rather soon, it shakes up also grandparents' existence. Grandparents extensively support parents in growing up their children, they provide baby-sitting over the weekend or during the evening, care for children when parents are at work, and when grandparents are given their grandchildren custodial, they fully substitute for parents.

In the European countries included in SHARE (the Survey of Health, Ageing and Retirement in Europe), the proportion of grandparents that report to look after their grandchildren ranges from 38 percent in Estonia to 63 in the Netherlands. Depending on the level of childcare services provided by the state, the proportion of grandparents reporting to look after their grandchilds almost daily varies from 1.5 percent in Scandinavian countries to an astonishing 24 percent in Italy. Nevertheless, also in Sweden and Denmark about 17 percent of the grandparents report to look after their grandchild at least once a week (in Italy the corresponding figure being 38 percent).

Grandparents supply informal childcare, which supplements or substitutes that provided by the state. Typically, informal care is more flexible and fits better with parents' needs and as such it is very valuable to parents. This inter-generation exchange is nonmarket, fully unregulated and belongs to that ample set of services that are exchanged on the basis of reciprocity and trust within families. It is perhaps the most visible and common yield of social capital (Folland, 2014).

Informal care is also valuable to the generality of taxpayers given that it does not imply any additional fiscal burden (at least upfront). Nonetheless grandchild caring has an opportunity cost, which includes the value of time to grandparents, besides other monetary and non-monetary costs. Among the latter there might be consequences on grandparents' wellbeing and health, due to the stress or the mental and physical fatigue associated to child caring. Indeed an early literature in gerontology on custodial grandparents in the US generally finds a deterioration of grandparents health. Looking at wellbeing, recently Deaton and Stone (2013) suggest that the quality of life worsens for grandparents living with their grandchildren.

In this paper I ask whether also occasional childcaring, less demanding compared to custodial, has similar negative effects, or if, on the other way round, it could have beneficial influences to grandparents physical and mental health.

Caring grandchildren increases the likelihood to grandparents of making physical activities and having social interactions. Thus, it might help grandparents to remain active, both physically and mentally, stimulate them to acquire new competences and remain receptive to novelties, and induce them to be socially open. Furthermore, grandchild care can be rewarding to grandparents, it gives them a role, commonly perceived as useful and productive (Pruchno, 1999). On the other hand, grandchildren could be a source of additional stress to grandparents, they might ask too much to grandparents' energies and might divert time, attention and resources necessary to remain in good health (Hughes et al. 2007).

Assessing the direction and the size of the effect of childcare is made difficult by the fact that the assignment of a grandchild to an elderly is not random but, rather, the result of a complex decision process. First of all, the probability of having grandchildren (and their number) depends on the number of a grandparent's children. Fertility decisions for both grandparents and their children depend on preferences about the ideal number of babies as well as economic considerations, such as the necessity to provide them enough opportunities given the available and expected family budget. Second, since for any grandchild there are usually four grandparents, the matching grandchild-grandparent is determined by taking into account grandparents' age, health conditions, time availability, willingness to provide care, proximity, the quality of the relationship between grandparents and parents, etc. Typically mothers prefer to ask their own parents for grandchild care (Reinkowsky, 2013).

Thus, grandparents both self-select and are selected in childcare provision on the basis of their characteristics (Fuller-Thomson and Minkler, 2001). As a result, the grandparents who provide childcare markedly differ from those who do not even prior to becoming caregivers. In particular, the caregivers likely have better health conditions and more mental readiness (Hank and Buber, 2009; Luo et al. 2012).

In this paper I try to identify the causal effect of looking after grandchildren by paying particular attention to the problem of selection. I look at two groups of participants in SHARE longitudinal dataset, who were interviewed three times in 2004/05, 2006/07 and 2011/12. The first group is composed of those who did not provide childcare in any of the three periods. The second is composed by those who reported to provide child caring in the third period (2011/12) but never before. Next, I compare by means of a standard difference-in-differences model the trends in a battery of health outcomes between the first group (the control or comparison group) and the second group (the treatment group). If childcaring, occurring only in the third period and only for the treatment group, had any effect, I should observe a shift in the trend of the treatment group compared to the trend of the control group. The underlying identification assumption is the so called common trend condition, which requires that in the absence of childcaring, the trends of treatment and control group have to be identical. To provide support to the common trend assumption I compare the trends of both groups between 2004/05 and 2006/07, when no child caring is reported.

My results indicate that providing childcare significantly improves certain health outcomes for both genders, although the majority of them seems to remain unaffected. In particular, for both genders I observe a significant improvement in recall abilities, a result consistent with the expectation that dealing with children stimulates elderly mental activity. Comparing these results with those obtained by standard OLS regressions, which indicated much stronger and ubiquitous effects of childcaring, I conclude that the empirical problem of self-selection is particularly acute, even when one disposes of a large battery of controls which include grandparents' characteristics in early life.

I have further examined whether the impact of chidcaring varies with its intensity. Results do not reveal significant differences between high intensity (at least once a week) and low intensity (less often than once a week) childcaring. Finally, I have tentatively investigated whether the effects of childcaring are

permanent or temporary by comparing trends in the outcomes of interest between two other groups of subjects included in SHARE, those who reported of looking after their grandchildren in all three periods (the new comparison group) and those who reported of providing child caring in 2004/05 and 2006/07 but not in 2011/12 (the new treatment group). This way I focus on how health conditions change when grandparents stop childcaring. Results suggest that the benefits of childcaring are indeed temporary, but this conclusion needs to be taken with caution, as I shall discuss below.

The paper is organized as follows. Section 2 reviews the literature. Section 3 presents data in detail. Section 4 introduces the model and discusses more in depth the identification strategy. Section 5 describes the results and section 6 provides two extensions. Conclusions follow.

2. Literature

Early studies from the US documented a negative effect of providing grandchild care to grandparents' physical and mental health, especially when caring involved co-residence rather than just (more or less frequent) babysitting (see Hugues et al 2007 for a survey). For instance, Minkler and Fuller-Thomson (1999) looked at grandparents that were "primary responsible" for their grandchildren for 6 months or more, a situation occurring when grandparents were given the custodial of their grandchildren in the absence of the natural parents, because under-aged, or drug users, or in case of violence or incarceration. The comparison of caregivers and non-caregivers produced evidence of significantly higher odds of suffering from limitations in activities of daily life, poorer self-reported health and lower life satisfaction. However, according to Hugues et al. (2007) the negative results emerging in this early literature were likely due to imperfectly controlled problems of selection. When the differential characteristics of caregivers and noncaregivers are properly accounted for, there is limited evidence pointing to a negative effect of caregiving on grandparents' health.

Recently Deaton and Stone (2013) have analysed the impact of living with a child to elders' wellbeing (irrespective of child's relation with the elder), by using extensive US and international Gallup datasets. Their data do not allow to properly tag grandchildren, although the situation of children living with elders is typically observed in cross-generation families where grandparents, one of their children, its spouse and the grandchildren reside together. The authors find a negative effect of co-residence on the elderly levels of stress and wellbeing. However, they strongly remark the risks of self-selection. In particular, in the US, the elderly value their ability to live independently and those who reside together to their children and grandchildren have often worse health conditions.

Tsai at al. (2013) exploring Taiwanese data from a panel similar to SHARE, the Study of Health and Living Status of the Middle-Aged and Elderly in Taiwan, also known as the Taiwan Longitudinal Study on Aging (TLSA), comprising individuals aged 60 and over, have found a significant negative association between grandchild caring and depression, after controlling for age, gender, ethnicity, education level, employment status, living place, self-reported health and time dummies.

Grundy et al. (2012) in a longitudinal study conducted in Chile have found that grandchild caring yields better life satisfaction and lower risks of depression to grandparents aged between 66 and 68 even after controlling for baseline mental health, indicators of functional health as well as socio-economic characteristics.

Ku et al. (2012), by using TLSA, study whether grandchild caring has an effect on health, measured by self-reported health, the presence of depressive symptoms and difficulties in mobility. Subjects are followed between 1993 and 2003 and observed four times. Ku and co-authors address self-selection by means of individuals fixed effects and instrumental variables to account for both time-invariant and time-varying factors which determine self-selection in grandchild care. Adopted instruments are (1) the number of ever-

married adult children and (2) the number of grandchildren reported by the grandparent. The rationale is that the demand for babysitting assistance will be higher if children are married and the larger is the number of grandchildren. Results suggest that providing grandchildren care significantly reduces mobility difficulties, but has no effect on depression and self-reported health.

The more closely related study to mine is the recent work of Reinkowski (2013), which uses SHARE data and looks at the effect of occasional grandchild care on physical health, cognitive functioning and mental health of grandmothers in Europe. Five alternative estimators are performed, simple OLS, propensity score matching, individuals fixed effects, lagged dependent variable (supposed to be a summary statistics for all observables and unobservables) and IV. Regarding the latter, the instrument adopted is the gender of the firstborn grandmother's child (as in Rupert and Zanella, 2014). Results suggest that occasional caregiving (less than 500 hours per year) has no causal effect on grandparents health outcomes and that the positive and significant associations observed in OLS and propensity score matching estimates were driven by selection bias.

3. Data

I use data drawn from SHARE (the Survey of Health, Ageing and Retirement in Europe). SHARE is a longitudinal multidisciplinary study focusing on ageing which is being carried out in Europe and which surveys nationally representative samples of the population aged 50 or over. The first wave has been collected in 2004/2005 and included 11 countries. The second wave dates of 2006/2007 and includes 14 countries. The third wave, called SHARELIFE, asks retrospective information, spanning from early family background conditions to job history, health and health care and household composition. In the third wave, fielded between 2008 and 2009 in 13 countries, no information on current individuals' living is collected and for this reason the third wave is not part of the regular SHARE panel. The last available wave is the fourth, collected in 2011/2012 in 16 countries, which represents the third regular wave of the panel together with wave 1 and 2.[1] About 150,000 observations deriving from 85,000 individuals compose SHARE dataset up to now.

In this paper I use only individuals who were interviewed in all four waves. This fact alone drastically reduces the size of the available sample and the number of surveyed countries. Removed observations with missing data, the remaining sample includes about 5600 women and 4500 men residing in 10 countries (Austria, Belgium, Denmark, France , Germany, Italy, Netherlands, Spain, Sweden and Switzerland).

I have further trimmed the sample because I have retained only individuals belonging to one of the following four groups: group 1) individuals who did not look after a grandchild in any of the three waves of the regular panel; group 2) individuals who did not look after a grandchild in the first two waves, but who did in the third wave; group 3) individuals who looked after a grandchild in all three waves; and, finally, group 4) individuals who looked after a grandchild in the first two waves but not in the third.

About 1000 women and 850 men are thus excluded. The resulting sample at use is then composed of 4595 women and 3640 men: 2457 women and 2074 men belong to group 1; 456 women and 498 men belong to group 2; 1206 women and 760 men belong to group 3 and finally 476 women and 308 men belong to group 4.

All these persons are interviewed three times, in 2004/05, 2006/07 and 2011/12. At these times I observe a battery of physical and mental health outcomes, as well as health-relevant behaviours. Moreover I have information on time-variable items such as household composition, family income, employment status, as

[1] Wave 5 is expected to be released in 2015 while wave 6 is now planned.

well as time-invariable items such as education and family background when the respondent was aged 10. The latter information comes from SHARELIFE. Overall, the number of observations is 24705.

Table 1 and 2 below include summary statistics for the outcome variables, separately by gender, and distinguishing by group and wave. All outcome variables are dummies excepting from the index of wellbeing CASP which is continuous. *Depressed* takes 1 when the EURO-D depression index (ranging from 0 to 12) takes a value above 3, meaning that the respondent indicated more than three symptoms of depression in a list of 12. *Poorhealth* takes 1 if self-reported health (SHR) very poor or poor (compared to fair, good or very good). *Chronicd* takes 1 if the respondent report at least one chronic disease. *Mobility* takes 1 if the mobility index is positive, indicating that the respondent reports difficulties in mobility. *ADL* takes 1 if the ADL index is positive, indicating difficulties in the activities of daily life. *R1* (immediate recall) is a dummy which takes 1 if the respondent is able to recall and report 5 or more words out of the ten words pronounced by the interviewer. *R2* (delayed recall) takes 1 if the respondent is able to recall and report 5 or more words few minutes after the interviewer pronounced them. *Overweight* takes 1 if the respondent is overweight or obese (according to his BMI). *Smoke* takes 1 if the respondent currently smokes. *Sport* takes 1 if the respondent does sports or vigorous physical activities at least once a week. *Doctor* takes 1 if the person saw his family doctor more than 6 times during the year before the interview. *Hospital* takes 1 of the person has been hospitalized during the year before the interview. Finally, CAPS is an index of quality of life and wellbeing, ranging from 12 to 48, with scores below 35 indicating poor quality of life, and scores above 39 very high quality of life.

[TABLE 1 ABOUT HERE]

[TABLE 2 ABOUT HERE]

The explanatory variables are reported in Table 3 and include usual indicators of education level (ISCED coding), family income (in deciles), employment status (active vs. inactive or retired), household composition (number of children and grandchildren, marital status, age of the partner). More importantly, indicators of family background at early life (when the respondent was aged 10) include the number of books owned by the respondent family, the type of occupation of the breadwinner (recoded in four categories starting from the original 10-level ISCO codification), the self-assessed relative ability in maths and language compared to respondent's school-mates. These variables are useful controls because they are predetermined and are likely to have influenced the entire life of the grandparents, and at least in part, of their children.

[TABLE 3 ABOUT HERE]

4. The model

To begin with, consider a simple linear model, to be estimated over a cross section of data. Let it be defined as:

$$y_i = \delta_0 + \delta_1 L_i + X_i\beta + \mu_i + \varepsilon_i \qquad (0)$$

where the outcome of interest for individual *i* is given by y_i, L_i is a dummy variable taking 1 for those looking after a grandchild, X_i is a set of controls and μ_i stands for unobservable individual characteristics. Finally ε_i is a random zero-mean noise. Consider the conditional expectation of y_i and the marginal effect of L_i on y_i:

$$E(y_i|L,X) = \delta_0 + \delta_1 L + X\beta + E(\mu_i|L,X)$$

$$E(y_i|L=1,X) - E(y_i|L=0,X) = \delta_1 - [E(\mu_i|L=1,X) - E(\mu_i|L=0,X)]$$

Since grandparents looking after a grandchild are self-selected, the marginal effect of *L* is not captured by δ_1 alone, even after conditioning on *X*. Unobservable characteristics can be unevenly distributed across groups and could be only partly explained by the observables. For this reason the term $[E(\mu_i|L=1,X) - E(\mu_i|L=0,X)]$, the selection bias, is likely non-zero.

For instance the number of grandchildren is strictly correlated with the number of children which in turn depends on the economic conditions of the grandparents in the past, their education level, their housing conditions, their employment status, the availability of child caring services, a preference for a large or a small number of children. Next, grandparents' economic support could have also influenced their children fertility decisions (Reinkowsky, 2013) as well as grandparents' fertility preferences might have transmitted to their children.

The number of grandchildren is not the only factor which determines whether a grandparent looks after them. In fact parents can choose among typically four grandparents (or at least two pairs of them) who entrust their children to, depending on their proximity, their health and psychological status, whether grandparents' house fits with children needs etc. On top of that, grandparents must be willing to look after their grandchildren. This might depend on their working conditions or the quality of the relations between the grandparents and their children.

It follows that grandparents who look after their grandchildren could have better physical and psychological health even prior they start childcaring. In particular it could be that a grandchild is assigned to them precisely because they are in good health.

In order to take into account self-selection, especially that depending on unobservables (such as the latent health capital or the propensity to develop a disease in future), we need to re-define model (0).

Consider the following model

$$y_{it} = \alpha_0 + \alpha_1 L_i + \alpha_2 T_t + \alpha_3 L_i * T_t + X_{it}\beta + \mu_i + \varepsilon_{it} \quad (1)$$

where y_{it} is one possible outcome for individual *i* at time *t*=1,2,3 (corresponding to the waves of the regular SHARE panel). The dummy variable L_i takes zero to identify the seniors who belong to group 1, i.e. those who did not look after a grandchildren at any time t=1,2,3, and one to identify the seniors belonging to group 2, i.e. those who looked after a grandchild at time t=3 (but not at time 1 and 2). The dummy variable T_t takes 1 if t=3 and 0 at time t=1,2. Both time-varying and time-invariant controls are included in *X*. Finally μ_i are unobservable time-invariant individual characteristics and ε_{it} is an independent disturbance. The inclusion of the interaction between L_i and T_t makes model (1) a canonical difference-in-differences model.

The effect of looking after a grandchild is captured by the parameter α_3 which measures the shift in the trend of y_{it} in group 2 (the treated group) compared to group 1 (the control group). The identification assumption which makes possible to attribute the jump to the effect of grandchild caring is known as common trend condition and requires that outcome trends are equal between group 1 and group 2, were group 2 not looking after a grandchild at t=3.

The trend in y_{it} in group 1, i.e. what can be thought as the normal decline or growth in y_{it} due to ageing, is given by

$$\begin{aligned} E(y_{it}|L_i = 0, T_t = 1, X) - E(yit|L_i = 0, T_t = 0, X) = \\ = \big(\alpha_0 + \alpha_2 + X\beta + E(\mu_i|L_i = 0, T_t = 1, X)\big) - \big(\alpha_0 + X\beta + E(\mu_i|L_i = 0, T_t = 1, X)\big) = \\ = \alpha_2 \end{aligned}$$

where the last equality is guaranteed by the fact that μ_i is time-invariant and exactly the same persons belong to group 1 at all times. Overtime differencing eliminates the contribution of the unobservables.

Similarly, the trend of y_{it} in group 2, which is affected by the activity of child caring, is given by

$$E(y_{it}|L_i = 1, T_t = 1, X) - E(y_{it}|L_i = 1, T_t = 0, X) =$$
$$= \left(\alpha_0 + \alpha_1 + \alpha_2 + \alpha_3 + X\beta + E(\mu_i|L_i = 1, T_t = 1, X)\right) - \left(\alpha_0 + \alpha_1 + X\beta + E(\mu_i|L_i = 1, T_t = 1, X)\right) =$$
$$= \alpha_2 + \alpha_3$$

where, again the last equality depends on the time-invariance of μ_i.

The trend in group 2 adds to the underlying trend due to aging and common to everyone, α_2, the additional component α_3 , which represents the effect of looking after grandchildren. Indeed the difference-in-differences parameter α_3 captures shifts in trends that should otherwise be equal in the absence of the treatment.

A DID model identifies the effect of interest if the assumption of common trend between group 1 and group 2 (in the absence of grandchild caring) is valid. To provide support to this assumption I have estimated model (1) only over time 1 and 2, when both group 1 and 2 do not look after grandchildren[2]. Thus, if the common trend assumption were valid, I should observe no significant difference between the trends of the two groups. I stress that exactly the same persons included in the sample analysed above are used to perform this test. For each outcome I report the test of common trend at the bottom of the tables of estimates.

5. Results

Table 4 and 5 report OLS estimates of model (0), over the entire sample available time t=3, separately by gender. In this case, only variation between individuals contributes to the estimates. The battery of controls reported in Table 3 (including country dummies) is added to the regression for each possible outcome.

[TABLE 4 ABOUT HERE]

[TABLE 5 ABOUT HERE]

For both genders, estimates suggest that looking after a grandchildren is associated with better health conditions, less depression, better recall capacity, more physical activity and more quality of life and wellbeing. Differences between genders are rather minor.

In spite of large set of controls, these associations could be spurious and due to omitted variables (selection). The DID specification discussed in the previous section address this concern since it properly accounts for self-selection. Tables 6 and 7 report DID estimates, separately by gender, based on the subsample composed of groups 1 and 2, as defined in Section 3. The parameter of interest is that associated to the interaction L_i*T_t, included in model (1). Accounting for self-election, most of the significant associations observed in Tables 4 and 5 disappear.

[TABLE 6 ABOUT HERE]

[TABLE 7 ABOUT HERE]

For both genders estimates reveal a significant protective effect as regards the outcome *ADL*: the probability of reporting difficulties in the activities of daily life is 2.9 percentage points lower among the grandmothers looking after grandchildren (resp. 4.1 percentage point lower among the grandfathers). Similarly, the probability of delayed recalling (R2) is 7.9 percentage points larger among caregiving grandmothers and 4.2 percentage points larger among caregiving grandfathers. Among females only, the probability of reporting of being in poor health is 4.8 percentage points lower and lower is also the

[2] Besides dropping observations at t=3, the dummy Tt is to redefined such that Tt=1 if t=2 and Tt=0 if t=1.

probability of smoking (by 3.7 percentage points). Among males there is marginal evidence of more likely overweight and obesity (the corresponding probability being 3.5 percentage points higher, significant at 90 percent).

At the bottom of both Tables 6 and 7, I report the test of common trend, which is obtained by estimating model (1) only on t=1 and t=2, when both subjects included in groups 1 and 2 do not look after their grandchildren by definition. The common trend hypothesis is never rejected.

Extensions

I extend the basic analysis in two directions.

First, focusing on women only because of the larger sample size, I explore whether the intensity of child caring matters. I distinguish between grandparents who look after their grandchilds at least once a week and those who do it less often. In both cases the comparison group is group 1. In Table 8 I report estimates derived from the comparison of group 2, restricted to grandmothers who look after their grandchildren at least once a week, with group 1. In Table 9 I report the corresponding estimates when I restrict group 2 to those grandmothers who look after their grandchildren strictly less often than once a week. By comparing Tables 8 and 9, some variations in the patterns of the effect of childcaring appear, but the estimates are not significant different across Tables 8 and 9.

[TABLE 8 ABOUT HERE]

[TABLE 9 ABOUT HERE]

Second I wander weather the protective effects of looking after grandchildren persist after childcaring ends. To answer this question I apply the DID method discussed above on the sample composed of group 3 and group 4, i.e. those seniors who looked after a grandchild in all periods t=1,2,3 (group 3) and those seniors who looked after a grandchild only in periods t=1 and t=2 but not in period t=3.

Results are reported, separately by gender, in Tables 10 and 11.

[TABLE 10 ABOUT HERE]

[TABLE 11 ABOUT HERE]

They suggest an inverse effect compared to that observed in the previous section, suggesting that the benefits of child-caring are temporary. However these results need to be taken with caution because in a number of cases the common trend assumption does not hold and because the size of group 4 is relatively small. Failure in the test of common trend is not surprising because the end of child caring due to the fact that children grow up and spend more time to school or alone, can be fully anticipated by grandparents which might change their behaviours well before childcaring ends.

Conclusions

TO COME

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TABLES

Table 1. Outcome variables – Females

		Wave 1 and 2			Wave 3		
Group	variable	mean	std. dev.	Obs.	mean	std. dev.	Obs.
Group 1: no GC caring in all waves	depressed (EURO-D>3)	0.315	0.465	4914	0.328	0.469	2457
	poor health (SRH=1 or SRH=2)	0.352	0.478	4914	0.435	0.496	2457
	any chronic disease	0.681	0.466	4914	0.746	0.436	2457
	any mobility difficulty	0.344	0.475	4898	0.441	0.497	2449
	any difficulty in activities of daily life	0.111	0.314	4900	0.188	0.391	2450
	immediate recall (recall more than 4 words)	0.62	0.486	4914	0.604	0.489	2457
	delayed recall (recall more than 4 words after some time)	0.353	0.478	4914	0.372	0.484	2457
	overweight or obese	0.531	0.499	4608	0.521	0.5	2304
	smoke	0.135	0.342	4888	0.137	0.344	2444
	any sport activity	0.431	0.495	4762	0.365	0.481	2381
	hospital	0.141	0.349	4892	0.17	0.375	2446
	visit doctor more than 6 times last year	0.353	0.478	4836	0.38	0.486	2418
	CASP (Wellbeing index)	37.526	6.211	2760	37.44	6.469	1380
Group 2: no GC caring in waves 1 and 2; GC caring in wave 4	depressed (EURO-D>3)	0.276	0.447	912	0.289	0.454	456
	poor health (SRH=1 or SRH=2)	0.232	0.423	912	0.276	0.448	456
	any chronic disease	0.557	0.497	912	0.656	0.476	456
	any mobility difficulty	0.186	0.389	910	0.266	0.442	455
	any difficulty in activities of daily life	0.046	0.21	910	0.086	0.28	455
	immediate recall (recall more than 4 words)	0.755	0.43	912	0.785	0.411	456
	delayed recall (recall more than 4 words after some time)	0.473	0.5	912	0.572	0.495	456
	overweight or obese	0.488	0.5	864	0.498	0.501	432
	smoke	0.151	0.359	912	0.116	0.321	456
	any sport activity	0.534	0.499	908	0.482	0.5	454
	hospital	0.092	0.29	910	0.108	0.31	455
	visit doctor more than 6 times last year	0.252	0.435	900	0.26	0.439	450
	CASP (Wellbeing index)	38.79	5.533	538	38.613	5.937	269
Group 3: GC caring in all waves	depressed (EURO-D>3)	0.247	0.431	2412	0.262	0.44	1206
	poor health (SRH=1 or SRH=2)	0.226	0.419	2412	0.289	0.453	1206
	any chronic disease	0.635	0.481	2412	0.715	0.452	1206
	any mobility difficulty	0.212	0.409	2408	0.266	0.442	1204

	any difficulty in activities of daily life	0.049	0.217	2408	0.061	0.239	1204
	immediate recall (recall more than 4 words)	0.773	0.419	2412	0.782	0.413	1206
	delayed recall (recall more than 4 words after some time)	0.453	0.498	2412	0.524	0.5	1206
	overweight or obese	0.568	0.495	2312	0.567	0.496	1156
	smoke	0.139	0.346	2402	0.122	0.327	1201
	any sport activity	0.561	0.496	2396	0.479	0.5	1198
	hospital	0.111	0.315	2404	0.135	0.342	1202
	visit doctor more than 6 times last year	0.283	0.45	2394	0.307	0.462	1197
	CASP (Wellbeing index)	38.921	5.449	1472	39.056	5.577	736
Group 4: GC caring in waves 1 and 2; no GC caring in wave 4	depressed (EURO-D>3)	0.305	0.46	952	0.34	0.474	476
	poor health (SRH=1 or SRH=2)	0.32	0.467	952	0.45	0.498	476
	any chronic disease	0.723	0.448	952	0.767	0.423	476
	any mobility difficulty	0.282	0.45	950	0.402	0.491	475
	any difficulty in activities of daily life	0.072	0.258	950	0.145	0.353	475
	immediate recall (recall more than 4 words)	0.647	0.478	952	0.641	0.48	476
	delayed recall (recall more than 4 words after some time)	0.333	0.472	952	0.378	0.485	476
	overweight or obese	0.616	0.487	910	0.578	0.494	455
	smoke	0.143	0.35	946	0.135	0.342	473
	any sport activity	0.497	0.5	938	0.377	0.485	469
	hospital	0.158	0.365	950	0.192	0.394	475
	visit doctor more than 6 times last year	0.339	0.474	940	0.377	0.485	470
	CASP (Wellbeing index)	37.813	5.386	572	37.126	6.162	286
Full sample	depressed (EURO-D>3)	0.292	0.455	9190	0.308	0.462	4595
	poor health (SRH=1 or SRH=2)	0.304	0.46	9190	0.382	0.486	4595
	any chronic disease	0.661	0.473	9190	0.731	0.444	4595
	any mobility difficulty	0.287	0.453	9166	0.373	0.484	4583
	any difficulty in activities of daily life	0.084	0.278	9168	0.14	0.347	4584
	immediate recall (recall more than 4 words)	0.676	0.468	9190	0.673	0.469	4595
	delayed recall (recall more than 4 words after some time)	0.389	0.488	9190	0.433	0.495	4595
	overweight or obese	0.546	0.498	8694	0.537	0.499	4347
	smoke	0.139	0.346	9148	0.131	0.337	4574
	any sport activity	0.483	0.5	9004	0.408	0.492	4502
	hospital	0.13	0.337	9156	0.157	0.363	4578
	visit doctor more than 6 times last year	0.323	0.468	9070	0.349	0.477	4535
	CASP (Wellbeing index)	38.068	5.891	5342	37.97	6.193	2671

Table 2. Outcome variables – Males

		Wave 1 and 2			Wave 4		
Group	variable	mean	std. dev.	Obs.	mean	std. dev.	Obs.
Group 1: no GC caring in all waves	depressed (EURO-D>3)	0.158	0.365	4148	0.185	0.389	2074
	poor health (SRH=1 or SRH=2)	0.261	0.439	4148	0.371	0.483	2074
	any chronic disease	0.628	0.483	4148	0.693	0.461	2074
	any mobility difficulty	0.193	0.395	4132	0.288	0.453	2066
	any difficulty in activities of daily life	0.068	0.252	4134	0.133	0.339	2067
	immediate recall (recall more than 4 words)	0.579	0.494	4148	0.577	0.494	2074
	delayed recall (recall more than 4 words after some time)	0.268	0.443	4148	0.311	0.463	2074
	overweight or obese	0.648	0.478	3984	0.633	0.482	1992
	smoke	0.194	0.396	4096	0.179	0.383	2048
	any sport activity	0.522	0.5	4066	0.473	0.499	2033
	hospital	0.13	0.336	4116	0.177	0.382	2058
	visit doctor more than 6 times last year	0.26	0.439	4066	0.337	0.473	2033
	CASP (Wellbeing index)	38.589	5.654	2470	38.669	5.733	1235
Group 2: no GC caring in waves 1 and 2; GC caring in wave 4	depressed (EURO-D>3)	0.115	0.32	996	0.147	0.354	498
	poor health (SRH=1 or SRH=2)	0.207	0.405	996	0.299	0.458	498
	any chronic disease	0.547	0.498	996	0.653	0.477	498
	any mobility difficulty	0.121	0.326	994	0.195	0.397	497
	any difficulty in activities of daily life	0.043	0.204	994	0.068	0.253	497
	immediate recall (recall more than 4 words)	0.696	0.46	996	0.693	0.462	498
	delayed recall (recall more than 4 words after some time)	0.331	0.471	996	0.412	0.493	498
	overweight or obese	0.648	0.478	964	0.695	0.461	482
	smoke	0.229	0.42	996	0.199	0.399	498
	any sport activity	0.644	0.479	992	0.597	0.491	496
	hospital	0.105	0.306	994	0.147	0.354	497
	visit doctor more than 6 times last year	0.21	0.407	992	0.294	0.456	496
	CASP (Wellbeing index)	39.112	5.224	614	39.661	5.248	307
Group 3: GC caring in all waves	depressed (EURO-D>3)	0.122	0.328	1520	0.141	0.348	760
	poor health (SRH=1 or SRH=2)	0.2	0.4	1520	0.258	0.438	760
	any chronic disease	0.643	0.479	1520	0.724	0.447	760
	any mobility difficulty	0.127	0.333	1508	0.179	0.384	754
	any difficulty in activities of daily life	0.05	0.219	1508	0.08	0.271	754
	immediate recall (recall more than 4 words)	0.73	0.444	1520	0.713	0.453	760
	delayed recall (recall more than 4 words after some time)	0.351	0.478	1520	0.408	0.492	760

	overweight or obese	0.664	0.472	1490	0.672	0.47	745
	smoke	0.173	0.379	1506	0.141	0.348	753
	any sport activity	0.616	0.486	1506	0.574	0.495	753
	hospital	0.131	0.337	1506	0.181	0.385	753
	visit doctor more than 6 times last year	0.214	0.41	1506	0.276	0.447	753
	CASP (Wellbeing index)	39.457	4.952	944	39.735	5.051	472
Group 4: GC caring in waves 1 and 2; no GC caring in wave 4	depressed (EURO-D>3)	0.131	0.338	616	0.169	0.375	308
	poor health (SRH=1 or SRH=2)	0.281	0.45	616	0.38	0.486	308
	any chronic disease	0.713	0.453	616	0.756	0.43	308
	any mobility difficulty	0.182	0.386	614	0.326	0.469	307
	any difficulty in activities of daily life	0.077	0.266	614	0.156	0.364	307
	immediate recall (recall more than 4 words)	0.597	0.491	616	0.558	0.497	308
	delayed recall (recall more than 4 words after some time)	0.242	0.429	616	0.282	0.451	308
	overweight or obese	0.677	0.468	598	0.679	0.468	299
	smoke	0.174	0.38	608	0.168	0.374	304
	any sport activity	0.548	0.498	606	0.452	0.499	303
	hospital	0.158	0.366	612	0.225	0.419	306
	visit doctor more than 6 times last year	0.309	0.462	612	0.412	0.493	306
	CASP (Wellbeing index)	39.117	5.182	366	38.328	5.778	183
Full sample	depressed (EURO-D>3)	0.143	0.35	7280	0.169	0.375	3640
	poor health (SRH=1 or SRH=2)	0.242	0.429	7280	0.338	0.473	3640
	any chronic disease	0.628	0.483	7280	0.699	0.459	3640
	any mobility difficulty	0.169	0.375	7248	0.256	0.436	3624
	any difficulty in activities of daily life	0.062	0.241	7250	0.115	0.319	3625
	immediate recall (recall more than 4 words)	0.628	0.483	7280	0.62	0.486	3640
	delayed recall (recall more than 4 words after some time)	0.292	0.455	7280	0.343	0.475	3640
	overweight or obese	0.654	0.476	7036	0.653	0.476	3518
	smoke	0.193	0.395	7206	0.173	0.378	3603
	any sport activity	0.561	0.496	7170	0.509	0.5	3585
	hospital	0.129	0.335	7228	0.178	0.382	3614
	visit doctor more than 6 times last year	0.248	0.432	7176	0.325	0.468	3588
	CASP (Wellbeing index)	38.893	5.422	4394	39.008	5.552	2197

Table 3. Explanatory variables – summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
female	24705	0.558	0.497	0	1
number of grandchildren	24705	2.519	3.108	0	20
number of children	24705	2.125	1.362	0	11
married	24705	0.702	0.457	0	1
partner's age	24705	44.562	30.871	0	99.3
age	24705	66.464	9.418	50	101.5
age>75 dummy	24705	0.200	0.400	0	1
Education level					
Reference: no education					
ISCED 1	24705	0.247	0.431	0	1
ISCED 2	24705	0.186	0.389	0	1
ISCED 3	24705	0.274	0.446	0	1
ISCED 4	24705	0.025	0.157	0	1
ISCED 5	24705	0.208	0.406	0	1
ISCED 6	24705	0.005	0.074	0	1
no information	24705	0.014	0.116	0	1
Family income (deciles)					
Reference: 1st decide					
2nd decile	24705	0.106	0.308	0	1
3rd decile	24705	0.106	0.308	0	1
4th decile	24705	0.102	0.302	0	1
5th decile	24705	0.103	0.304	0	1
6th decile	24705	0.102	0.303	0	1
7th decile	24705	0.098	0.297	0	1
8th decile	24705	0.092	0.289	0	1
9th decile	24705	0.096	0.294	0	1
10th decile	24705	0.094	0.292	0	1
employed or in search	24705	0.280	0.449	0	1
Number of books when aged 10					
Reference: between 0 and 10					
between 11 and 25	24705	0.192	0.394	0	1
between 26 and 100	24705	0.197	0.398	0	1
between 101 and 200	24705	0.061	0.239	0	1
more than 200	24705	0.063	0.243	0	1
no information	24705	0.095	0.293	0	1
Occupation of the breadwinner then aged 10					
Reference: Legislators and Professionals					
clerk, services	24705	0.132	0.339	0	1
skilled blue collar	24705	0.441	0.497	0	1

elementary occupation	24705	0.199	0.399	0	1
no information	24705	0.107	0.309	0	1
Relative position in maths when aged 10					
Reference: much better					
better	24705	0.226	0.419	0	1
about the same	24705	0.439	0.496	0	1
worse	24705	0.095	0.293	0	1
much worse	24705	0.021	0.145	0	1
no information	24705	0.112	0.315	0	1
Relative position in language when aged 10					
Reference: much better					
better	24705	0.242	0.429	0	1
about the same	24705	0.426	0.494	0	1
worse	24705	0.102	0.302	0	1
much worse	24705	0.014	0.118	0	1
no information	24705	0.114	0.318	0	1
Number of parents alive					
Reference: none					
one	24705	0.176	0.381	0	1
two	24705	0.045	0.208	0	1
no information	24705	0.018	0.133	0	1
Wave 1 dummy	24705	0.333	0.471	0	1

Table 4. OLS estimates – Females

VARIABLES	(1) depressed	(2) poorhealth	(3) chronicd	(4) mobility	(5) ADL	(6) R1	(7) R2	(8) overweight	(9) smoke	(10) sport	(11) hospital	(12) doctor	(13) CASP
lookafter	-0.017***	-0.046***	0.022***	-0.047***	-0.032***	0.041***	0.039***	0.010	-0.002	0.056***	-0.019***	-0.019***	0.744***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.005)	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)	(0.076)
number of grandchilds	0.002	0.002*	0.004***	0.004***	0.001	0.001	-0.003***	0.008***	0.004***	-0.004***	0.002*	0.002	0.009
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.017)
Observations	31,540	31,540	31,540	31,449	31,455	31,540	31,540	30,109	31,321	31,210	31,429	31,219	29,755
R-squared	0.064	0.195	0.117	0.179	0.099	0.239	0.208	0.063	0.073	0.127	0.027	0.080	0.234
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Education	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Income & active	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
background at 10	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
HH composition	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Controls are those reported in Table 3 and include, individual education (ISCED levels), employment status (active vs inactive and retired), family income (in deciles), number of children and grandchildren, marital status and age of the partner, number of parents alive and family background when aged 10 (namley, number of books, occupation of the breadwinner, self-assessment of relative competences in maths and language).

Table 5. OLS estimates – Males

VARIABLES	(1) depressed	(2) poorhealth	(3) chronicd	(4) mobility	(5) ADL	(6) R1	(7) R2	(8) overweight	(9) smoke	(10) sport	(11) hospital	(12) doctor	(13) CASP
lookafter	-0.016***	-0.046***	0.015**	-0.045***	-0.026***	0.044***	0.019***	0.009	-0.009	0.063***	-0.006	-0.015**	0.574***
	(0.006)	(0.007)	(0.007)	(0.006)	(0.005)	(0.007)	(0.007)	(0.007)	(0.006)	(0.007)	(0.006)	(0.007)	(0.084)
number of grandchilds	0.001	0.005***	0.005***	0.004***	0.002**	-0.003*	-0.002	0.009***	0.003**	-0.003*	0.002	0.003**	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.019)
Observations	24,799	24,799	24,799	24,692	24,698	24,799	24,799	23,939	24,637	24,596	24,660	24,538	23,345
R-squared	0.045	0.182	0.082	0.140	0.067	0.187	0.148	0.026	0.076	0.119	0.030	0.083	0.216
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Education	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Income & active	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
background at 10	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
HH composition	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Controls are those reported in Table 3 and include, individual education (ISCED levels), employment status (active vs inactive and retired), family income (in deciles), number of children and grandchildren, marital status and age of the partner, number of parents alive and family background when aged 10 (namley, number of books, occupation of the breadwinner, self-assessment of relative competences in maths and language).

Table 6. Difference-in-differences estimates – Females

VARIABLES	(1) depressed	(2) poorhealth	(3) chronicd	(4) mobility	(5) ADL	(6) R1	(7) R2	(8) overweight	(9) smoke	(10) sport	(11) hospital	(12) doctor	(13) CASP
wave 3 (Tt)	0.018*	0.027**	0.013	0.038***	0.033***	0.037***	0.046***	-0.012	0.041***	-0.007	0.010	-0.005	0.257
	(0.011)	(0.011)	(0.010)	(0.010)	(0.008)	(0.011)	(0.011)	(0.009)	(0.006)	(0.012)	(0.010)	(0.011)	(0.157)
group 2 (Li)	-0.012	-0.033*	-0.021	-0.036**	-0.002	-0.003	-0.022	-0.027	-0.022	-0.019	-0.018	-0.037*	0.734**
	(0.020)	(0.019)	(0.022)	(0.018)	(0.010)	(0.016)	(0.019)	(0.025)	(0.018)	(0.020)	(0.012)	(0.020)	(0.303)
group 2 * wave 3 (Li*Tt)	-0.001	-0.048**	0.015	-0.026	-0.029*	0.035	0.079***	-0.001	-0.037***	0.026	-0.010	-0.027	-0.082
	(0.024)	(0.022)	(0.023)	(0.021)	(0.015)	(0.022)	(0.025)	(0.018)	(0.014)	(0.027)	(0.019)	(0.023)	(0.327)
Observations	8,739	8,739	8,739	8,712	8,715	8,739	8,739	8,208	8,700	8,505	8,703	8,604	4,947
R-squared	0.059	0.133	0.119	0.173	0.102	0.284	0.234	0.067	0.072	0.163	0.033	0.114	0.235
Average outcome	0.313	0.359	0.685	0.351	0.125	0.638	0.383	0.522	0.137	0.426	0.142	0.345	37.70
test of common trend (group 2 * wave 2)	0.028	0.006	0.002	0.011	0.004	-0.005	-0.004	0.001	-0.002	0.005	0.028	-0.003	0.140
	(0.026)	(0.023)	(0.024)	(0.021)	(0.013)	(0.023)	(0.029)	(0.019)	(0.011)	(0.030)	(0.020)	(0.024)	(0.360)

Note: Robust standard errors in parentheses, clustered by individual. *** p<0.01, ** p<0.05, * p<0.1. Controls are always included although not reported. They are detailed in Table 3 and include individual education (ISCED levels), employment status (active vs inactive and retired), family income (in deciles), number of children and grandchildren, marital status and age of the partner, number of parents alive and family background when aged 10 (namely, number of books, occupation of the breadwinner, self-assessment of relative competences in maths and language). Country dummies are always included. The sample is composed by the subjects belonging to group 1 and group 2 and observed three times, in 2004/05, 2006/07 and 2011/12. The test of common support is obtained by estimating model (1) on the same individuals observed in 2004/05 and 2006/07 only. Only the interaction term is reported in the Table.

Table 7. Difference-in-differences estimates – Males

VARIABLES	(1) depressed	(2) poorhealth	(3) chronicd	(4) mobility	(5) ADL	(6) R1	(7) R2	(8) overweight	(9) smoke	(10) sport	(11) hospital	(12) doctor	(13) CASP
wave 3 (Tt)	0.028***	0.063***	0.028**	0.052***	0.047***	0.053***	0.076***	0.004	0.028***	0.013	0.019*	0.027**	0.125
	(0.010)	(0.011)	(0.011)	(0.010)	(0.008)	(0.012)	(0.012)	(0.010)	(0.008)	(0.013)	(0.011)	(0.012)	(0.160)
group 2 (Li)	-0.024*	-0.006	-0.024	-0.010	0.005	0.036**	-0.008	-0.011	0.023	0.064***	-0.004	0.003	0.164
	(0.014)	(0.018)	(0.022)	(0.014)	(0.009)	(0.017)	(0.018)	(0.023)	(0.020)	(0.020)	(0.012)	(0.017)	(0.283)
group 2 * wave 3 (Li*Tt)	0.006	-0.026	0.015	-0.026	-0.041***	-0.006	0.042*	0.035*	-0.015	0.007	-0.019	-0.005	0.399
	(0.018)	(0.023)	(0.023)	(0.019)	(0.014)	(0.024)	(0.024)	(0.019)	(0.017)	(0.025)	(0.020)	(0.025)	(0.296)
Observations	7,716	7,716	7,716	7,689	7,692	7,716	7,716	7,422	7,638	7,587	7,665	7,587	4,626
R-squared	0.044	0.128	0.086	0.143	0.067	0.234	0.171	0.034	0.063	0.117	0.041	0.114	0.172
Average outcome	0.159	0.286	0.637	0.210	0.0823	0.601	0.297	0.647	0.195	0.530	0.140	0.277	38.75
test of common trend (group 2 * wave 2)	-0.022	-0.030	0.020	-0.016	0.007	0.017	0.036	-0.019	-0.006	0.033	0.006	-0.036	-0.120
	(0.020)	(0.020)	(0.025)	(0.018)	(0.012)	(0.026)	(0.027)	(0.019)	(0.015)	(0.027)	(0.021)	(0.023)	(0.310)

Note: see Table 6

Table 8. DID estimates - High Intensity (at least once a week) – Females

VARIABLES	(1) depressed	(2) poorhealth	(3) chronicd	(4) mobility	(5) ADL	(6) R1	(7) R2	(8) overweight	(9) smoke	(10) sport	(11) hospital	(12) doctor	(13) CASP
wave 3 (Tt)	0.019*	0.027**	0.015	0.037***	0.033***	0.037***	0.044***	-0.011	0.041***	-0.004	0.012	-0.006	0.283*
	(0.011)	(0.011)	(0.010)	(0.011)	(0.008)	(0.011)	(0.011)	(0.009)	(0.006)	(0.012)	(0.010)	(0.011)	(0.159)
group 2 (Li)	-0.016	-0.037	-0.018	-0.044*	0.016	-0.026	-0.016	-0.025	-0.032	-0.042	-0.017	-0.043*	0.908**
	(0.026)	(0.026)	(0.029)	(0.024)	(0.015)	(0.023)	(0.026)	(0.033)	(0.023)	(0.026)	(0.015)	(0.026)	(0.396)
group 2 * wave 3 (Li*Tt)	0.002	-0.029	-0.009	-0.028	-0.060***	0.060*	0.057*	-0.020	-0.029	0.057	-0.006	-0.006	-0.231
	(0.034)	(0.031)	(0.031)	(0.028)	(0.020)	(0.031)	(0.034)	(0.024)	(0.018)	(0.037)	(0.024)	(0.033)	(0.491)
Observations	8,058	8,058	8,058	8,034	8,037	8,058	8,058	7,557	8,019	7,830	8,025	7,929	4,539
R-squared	0.059	0.128	0.121	0.172	0.102	0.279	0.232	0.067	0.075	0.163	0.032	0.113	0.233
Average outcome	0.318	0.371	0.693	0.363	0.131	0.623	0.369	0.527	0.135	0.416	0.146	0.356	37.53
test of common trend (group 2 * wave 2)	0.027	-0.021	-0.030	0.024	0.009	-0.006	0.019	-0.034	-0.010	-0.016	0.009	0.019	0.205
	(0.038)	(0.031)	(0.033)	(0.029)	(0.019)	(0.031)	(0.040)	(0.027)	(0.015)	(0.041)	(0.027)	(0.034)	(0.487)

Note: see Table 6. High Intensity caregivers are those grandmothers who look after their children at least once a week. Those providing childcare less often are excluded from the sample.

Table 9. DID estimates - Low Intensity (less often than once a week) - Females

VARIABLES	(1) depressed	(2) poorhealth	(3) chronicd	(4) mobility	(5) ADL	(6) R1	(7) R2	(8) overweight	(9) smoke	(10) sport	(11) hospital	(12) doctor	(13) CASP
wave 3 (Tt)	0.020*	0.025**	0.012	0.040***	0.033***	0.037***	0.046***	-0.013	0.041***	-0.007	0.010	-0.004	0.278*
	(0.011)	(0.011)	(0.010)	(0.011)	(0.008)	(0.011)	(0.011)	(0.009)	(0.006)	(0.012)	(0.010)	(0.011)	(0.158)
group 2 (Li)	-0.011	-0.032	-0.026	-0.028	-0.022**	0.024	-0.029	-0.028	-0.019	0.002	-0.016	-0.034	0.595
	(0.027)	(0.024)	(0.030)	(0.023)	(0.011)	(0.020)	(0.027)	(0.034)	(0.025)	(0.027)	(0.016)	(0.026)	(0.402)
group 2 * wave 3 (Li*Tt)	0.001	-0.072***	0.041	-0.027	-0.000	0.006	0.102***	0.019	-0.042**	-0.007	-0.014	-0.045	-0.049
	(0.031)	(0.027)	(0.033)	(0.028)	(0.020)	(0.027)	(0.033)	(0.023)	(0.020)	(0.037)	(0.027)	(0.030)	(0.378)
Observations	8,040	8,040	8,040	8,013	8,016	8,040	8,040	7,551	8,001	7,806	8,004	7,917	4,536
R-squared	0.060	0.133	0.119	0.173	0.104	0.284	0.238	0.066	0.072	0.166	0.033	0.115	0.227
Average outcome	0.315	0.366	0.693	0.362	0.129	0.631	0.375	0.523	0.137	0.420	0.147	0.350	37.67
test of common trend (group 2 * wave 2)	0.026	0.032	0.033	-0.007	-0.005	0.000	-0.031	0.030	0.006	0.024	0.046*	-0.027	0.090
	(0.033)	(0.031)	(0.033)	(0.029)	(0.015)	(0.031)	(0.040)	(0.024)	(0.016)	(0.040)	(0.028)	(0.032)	(0.493)

Note: see Table 6. Low intensity caregivers are those grandmothers who look after their children (strictly) less often than once a week. Those providing childcare once a week or more often are excluded from the sample.

Table 10. DID between groups 3 and 4. Females

VARIABLES	(1) depressed	(2) poorhealth	(3) chronicd	(4) mobility	(5) ADL	(6) R1	(7) R2	(8) overweight	(9) smoke	(10) sport	(11) hospital	(12) doctor	(13) CASP
wave 3 (Tt)	0.031**	0.032**	0.035**	0.028**	0.004	0.030**	0.090***	-0.003	0.034***	-0.049***	0.012	-0.014	0.066
	(0.015)	(0.015)	(0.016)	(0.014)	(0.008)	(0.015)	(0.018)	(0.013)	(0.009)	(0.018)	(0.013)	(0.016)	(0.199)
group 4 (Li)	0.039*	0.035	0.028	0.002	-0.002	-0.031*	-0.025	0.023	0.046**	-0.023	0.027*	0.019	-0.371
	(0.021)	(0.022)	(0.023)	(0.020)	(0.011)	(0.018)	(0.021)	(0.027)	(0.019)	(0.023)	(0.015)	(0.021)	(0.311)
group 4 * wave 3 (Li*Tt)	0.014	0.063**	-0.035	0.059**	0.064***	-0.002	-0.020	-0.034*	0.009	-0.035	0.011	0.020	-0.729**
	(0.026)	(0.025)	(0.023)	(0.024)	(0.018)	(0.024)	(0.027)	(0.019)	(0.013)	(0.029)	(0.024)	(0.026)	(0.343)
Observations	5,046	5,046	5,046	5,037	5,037	5,046	5,046	4,833	5,022	5,001	5,031	5,001	3,066
R-squared	0.081	0.109	0.089	0.102	0.054	0.231	0.169	0.065	0.075	0.095	0.026	0.102	0.221
Average outcome	0.270	0.280	0.683	0.256	0.0653	0.739	0.440	0.578	0.135	0.512	0.133	0.308	38.58
test of common trend (group 4 * wave 2)	-0.001	0.014	0.050**	-0.012	0.012	-0.024	-0.069**	-0.038*	0.011	-0.078**	-0.027	-0.035	-1.138***
	(0.028)	(0.025)	(0.024)	(0.026)	(0.016)	(0.028)	(0.029)	(0.020)	(0.011)	(0.032)	(0.025)	(0.029)	(0.352)

Note: Robust standard errors in parentheses, clustered by individual. *** p<0.01, ** p<0.05, * p<0.1. Controls are always included although not reported. They are detailed in Table 3 and include individual education (ISCED levels), employment status (active vs inactive and retired), family income (in deciles), number of children and grandchildren, marital status and age of the partner, number of parents alive and family background when aged 10 (namely, number of books, occupation of the breadwinner, self-assessment of relative competences in maths and language). Country dummies are always included. The sample is composed by the subjects belonging to group 3 and group 4 and observed three times, in 2004/05, 2006/07 and 2011/12. The test of common support is obtained by estimating model (1) on the same individuals observed in 2004/05 and 2006/07 only. Only the interaction term is reported in the Table.

Table 11. DID between groups 3 and 4. Males

VARIABLES	(1) depressed	(2) poorhealth	(3) chronicd	(4) mobility	(5) ADL	(6) R1	(7) R2	(8) overweight	(9) smoke	(10) sport	(11) hospital	(12) doctor	(13) CASP
wave 3 (Tt)	0.015	0.008	0.035*	0.004	0.010	0.005	0.089***	0.046***	0.015	0.022	0.012	0.004	0.007
	(0.015)	(0.018)	(0.020)	(0.016)	(0.011)	(0.019)	(0.021)	(0.016)	(0.013)	(0.022)	(0.019)	(0.020)	(0.237)
group 4 (Li)	-0.009	0.043*	0.029	0.003	0.000	-0.034	-0.029	0.031	0.038	-0.012	0.015	0.050*	0.015
	(0.020)	(0.025)	(0.029)	(0.021)	(0.016)	(0.024)	(0.024)	(0.031)	(0.025)	(0.029)	(0.019)	(0.026)	(0.389)
group 4 * wave 3 (Li*Tt)	0.001	0.036	-0.026	0.082***	0.043*	-0.011	-0.011	0.008	0.019	-0.043	0.005	0.045	-0.702*
	(0.026)	(0.032)	(0.031)	(0.029)	(0.024)	(0.035)	(0.033)	(0.024)	(0.019)	(0.035)	(0.032)	(0.035)	(0.419)
Observations	3,204	3,204	3,204	3,183	3,183	3,204	3,204	3,132	3,171	3,168	3,177	3,177	1,965
R-squared	0.054	0.110	0.059	0.092	0.060	0.184	0.143	0.067	0.080	0.070	0.046	0.112	0.158
Average outcome	0.133	0.247	0.687	0.169	0.0726	0.684	0.337	0.670	0.165	0.577	0.157	0.266	39.36
test of common trend (group 4 * wave 2)	-0.027	0.020	0.034	0.047	0.001	0.111***	-0.014	0.024	-0.009	-0.008	-0.051	0.018	-0.419
	(0.027)	(0.032)	(0.032)	(0.029)	(0.019)	(0.038)	(0.036)	(0.026)	(0.019)	(0.039)	(0.033)	(0.032)	(0.428)

Note: see Table 10.