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#### Abstract

Grandmothers provide far more childcare assistance than do grandfathers. This gender gap in grandparenting is well-documented, but not well-understood. The present study investigated whether, and to what extent, this gap was explained by a grandparent couple's division of labor into market and domestic work. We analyzed panel data from two waves of the Survey of Health, Ageing and Retirement in Europe, comprising respondents from 11 countries. Linear regression models yielded three main findings. First, the trade-off between childcare and market work within grandparent couples was relatively weak, operating roughly on a one-for-eight basis. Second, transitions to retirement substantially reduced the gender gap in grandparenting: if a single-earning grandfather retired, his share of a couple's total grandparenting hours increased by more than 30 percent. Third, controlling for couples' division of market work, the gender gap in grandparenting was smallest in the egalitarian north and largest in the traditional south of Europe, corresponding to a geographical gradient in the societal framing of gender roles. The results direct attention to the employment-family nexus in later life and highlight the importance of understanding grandparenting as a life course phenomenon, performed by the grandparent couple as a unit of interacting providers.


## Keywords

Gender, grandparenting, division of labor, older couples, cross-national comparison, linear regression, fixed-effects regression.

Thomas Leopold
European University Institute
Via delle Fontanelle 10
50014 San Domenico di Fiesole, Italy
Phone: +39 3337736704
Email: thomas.leopold@eui.eu

Jan Skopek
National Educational Panel Study
Wilhelmsplatz 3
96047 Bamberg
Phone: +49 9518633492
Email: jan.skopek@uni-bamberg.de

## Introduction

There is abundant evidence that grandmothers provide far more childcare assistance than grandfathers do. But why is this so? In the present study, we contend that although this gender gap is welldocumented, it is not well-understood.

Understanding the gender gap in grandparenting ${ }^{1}$ is not only an issue of academic interest. Grandparents remain an indispensable source of regular childcare assistance while the demand for older people in the workforce continues to grow. Thus, for an increasing number of grandparents, the fundamental issue of balancing work and family - along with the associated gender inequalities - will resurface after the birth of grandchildren. In view of a substantial, and persistent, gender gap in grandparenting, these pressures can be expected to affect primarily grandmothers. As grandmothers' participation in the workforce increases, so will their experience of competing roles.

The literature has most commonly attributed the gender gap in grandparenting to differences in role expectations. Grandmothers as kinkeepers are seen to engage in childcare because the grandparent role, "is essentially a maternal one" (Hagestad, 1981: 33). In keeping with this view, earlier studies of grandparenting neglected grandfathers completely, focusing only on grandmothers as "obvious" providers of childcare. More recent studies have greatly enriched the knowledge about grandparenting, emphasizing the salience of the grandfather role and recognizing grandfathers' contributions (Bates, 2009; Mann, 2007). Grandmothers' surplus in childcare assistance, however, was still taken for granted rather than conceptualized as an outcome in need of an explanation. As a result, this research has not provided a deeper understanding of gender differences in grandparenting.

The crux of the problem is that vague reference to gender roles is commonly seen to suffice as an explanation for the gender gap. It has long been noted, however, that more precision is necessary. Spitze and Ward (1998), for example, called for greater, "attention to the specific processes through which gender differences [among grandparents] may be produced or the conditions under which they might be expected to change" (p.113).

Concerning gender roles, there is a large literature investigating one of the key mechanisms that may generate these differences: a couple's division of labor into market and non-market work. Obviously, this issue not only applies to younger parents but can be generalized to a large number of grandparent couples: those who are still active in the labor market have to decide on each partner's involvement in either paid employment or looking after grandchildren as a type of domestic labor. Moreover, those who experience the transition to retirement offer a window into how previous arrangements of grandparenting may change or persist.

In view of this, the present study draws on theories of the division of labor in families to shed new light on gender differences in grandparenting. Our prime interest is in the relationship between arrangements of childcare and paid employment in grandparent couples. We address three main research questions. First, to what extent is grandmothers' greater involvement in childcare explained by their (lesser) involvement in paid employment? Second, how do transitions to retirement affect grandparent couples' division of childcare? Third, from a comparative vantage point, do these relationships vary according to women's labor force participation and the societal framing of gender roles?

Economic theories of family labor stress the importance of time availability and specialization of tasks into market and non-market work. These theories expect (i) a strong trade-off between each partner's share in each domain, (ii) a marked convergence of their relative contributions to childcare after retirement, and (iii) little cross-national variation in the gender gap net of labor force participation levels. Sociological accounts, in contrast, emphasize the enactment of gender beyond the rational allocation of tasks, predicting (i) a weaker association between each partner's share of paid work and grandparenting, (ii) little change in the division of childcare after retirement, and (iii) marked cross-national differences in the gender gap according to variation in socially constructed

[^0]gender roles. Thus, addressing our research questions not only contributes to understanding gender differences in grandparenting but also provides a novel application of established theories to the behavior of grandparent couples.

By introducing a couple perspective, we also attempt to advance grandparent research at a more general level. Previous studies were intrinsically based on an isolated view of the grandparent, separating the sexes analytically and discounting the simple empirical fact that most grandparents live in couples (Uhlenberg \& Kirby, 1998), taking joint responsibility for their grandchildren. Thus, a couple perspective is not only well-suited to address the basic question of why grandmothers provide more childcare, but also recognizes that grandparenting is often an activity performed by the grandparent couple as a unit of interacting providers.

Our empirical analysis was based on individual, household, and dyadic data from two waves (2004-2005 and 2006-2007) of the Survey of Health, Ageing and Retirement in Europe (SHARE) (Börsch-Supan et al., 2005), comprising respondents from 11 European countries. For the purposes of the present study, the SHARE data offered three important analytical benefits. First, detailed information about hours spent working and looking after grandchildren was collected separately from each member of a sample household, allowing us to calculate ratio measures of employment and childcare in grandparent couples. Second, this information was available across two panel waves, enabling us to study how transitions to retirement affected the division of childcare in grandparent couples. Third, the cross-national design of the SHARE offered an additional lens through which to view the division of labor in grandparent couples, as gender norms and the associated work and family policies vary strongly across Europe (Korpi, 2000; Palme, 2006).

## Theoretical Perspectives

In theoretical models of the gendered division of labor, the domain of non-market (or domestic) work is typically assumed to consist of housework tasks, such as cleaning and cooking. Applying these models to grandparents' division of childcare requires some conceptual clarification.

On the one hand, there are good reasons to employ similar models to account for both activities. In fact, many studies do so. As noted by Ishii-Kuntz and Coltrane (1992), housework and childcare are often, "considered to be equal inputs into the overall household economy ... [and] the questions of who washes dishes and who washes young children are typically assumed to result from similar causal forces" (p.629). Some empirical findings support this view. Men's participation in housework, for instance, is strongly correlated with their participation in childcare and both activities are traded off in similar ways against men's and women's hours of market work (Ishii-Kuntz \& Coltrane, 1992). An analytical separation between childcare and housework is further complicated by the fact that the former often involves the latter. In a recent review, a number of prominent analysts have criticized as incomplete or even incorrect those studies that isolate housework from childcare (Bianchi, Sayer, Milkie, \& Robinson, 2012).

On the other hand, we see at least three important conceptual differences, between these activities, which require consideration when applying theories of housework to the division of childcare. First, housework is commonly conceptualized as an onerous activity that both partners try to avoid. This notion is particularly important in dependency and bargaining models of the division of household labor in which economically less powerful household members, usually women, are forced to perform the undesirable housework tasks (e.g., Brines, 1994). To the vast majority of parents and grandparents, in contrast, childcare is not primarily burdensome but an activity that is far more enjoyable and meaningful than housework (Silverstein \& Marenco, 2001; Szinovacz, 1998). Not surprisingly, empirical results showed that partners' relative earnings - the typical indicator for bargaining power - were unrelated to their performance of childcare (Ishii-Kuntz \& Coltrane, 1992). Considering our research focus, it thus appears inadequate to assume that grandmothers or grandfathers intend to bargain out of childcare.

Second, housework tasks can usually be postponed, making them more compatible with work schedules. Childcare, in contrast, is less flexible and thus more likely to be traded off against work hours (Bianchi et al., 2012). Accordingly, theoretical models focusing on time availability, and the rational allocation of tasks, appear to be particularly well-suited to account for the division of childcare. Third, characteristics of housework activities are fairly time-constant, whereas tasks associated with childcare are strongly related to the age of the (grand)child and the associated developmental needs. To use the example given above, the need for washing the dishes persists, whereas the need for washing children vanishes with age. This point is particularly important when applying gender-role theories to the division of household labor in grandparent couples. "Feminine" tasks, such as changing diapers, are more associated with the needs of young grandchildren, whereas looking after older grandchildren interferes less with displays of masculinity.

## Availability, choice, and the gender gap in grandparenting

Economists have developed a variety of models on couples' division of market and domestic work. For the purposes of this study, it is sufficient to focus on the general formulations of the time availability hypothesis and the specialization-of-tasks hypothesis, both of which yield consistent predictions about the trade-off between childcare and market work within a grandparent couple, the effect of retirement on the division of childcare, and the cross-national variation of the gender gap in grandparenting.

According to the time availability hypothesis (Blood \& Wolfe, 1960; England \& Farkas, 1986), household members allocate their time rationally between non-market and market work. In this simple model, individuals with the fewest competing demands outside the home perform most domestic tasks. As applied to older couples and grandparenting, this hypothesis posits that grandmothers are more active caregivers because they face fewer demands on their time than grandfathers do.

The specialization-of-tasks hypothesis (Becker, 1991) focuses on the way in which household members divide work to maximize the well-being of the common unit. If partners are differentially skilled, those with higher productivity in the home will specialize in domestic work whereas those with higher earning capacities will devote more time to market work. According to this hypothesis, the gender gap in grandparenting emerges from a couple's joint efforts to maximize family utility - as a rational response to grandfathers' comparative advantage in wages and grandmothers' comparative advantage in childcare.

Both hypotheses are fundamentally gender-neutral. That is, if both spouses in a grandparent couple had equal time constraints, income capacity, and domestic productivity, there would be no reason to expect a gender gap in grandparenting. Conversely, this gap would be most pronounced in highly specialized sole-breadwinner households, irrespective of whether the breadwinner was male or female. Empirically, this view implies, first, a strong association between each partner's share of childcare and market work within a grandparent couple (Hypothesis la). In its purest (ideal-typical) form, grandparenting and market work would be traded off on a one-for-one basis. That is, the gender gap in grandparenting would be explained entirely by a grandparent couple's division of market work.

Second, the transition to retirement would markedly reduce the gender gap in grandparenting (Hypothesis 1b). This reduction would be proportional to the extent to which a grandparent couple's previous division of market work was gendered. Due to previous specialization, household productivity of former breadwinners, typically grandfathers, should be low compared to their homemaking counterparts. By relinquishing their work role, however, grandfathers minimize demands on their time and greatly reduce the opportunity costs of childcare. Thus, even if grandmothers are more competent caregivers, economic accounts would expect a rise in grandfathers' relative contributions after retirement and, accordingly, a reduction of the gender gap in grandparenting.

With regard to the cross-national comparison featured in the present study, it is important to emphasize a further assertion of these accounts: gender differences in tasks such as grandparenting are seen to emerge from rational choice within the context of a household - rather than gender norms
prevailing within the context of a society. Consequently, the gender gap in grandparenting is assumed to vary cross-nationally only to the extent that different policy and labor market incentives affect grandparents' rational division of labor. If these differences are already reflected by a couple's division of market work, there are no reasons to expect considerable cross-national variation in the gender gap in grandparenting net of labor force participation levels (Hypothesis 1c).

## Socialization, role enactment, and the gender gap in grandparenting

These economic perspectives have been criticized on various grounds. An influential critique originates in the feminist contention that the allocation of market and non-market work, "is about much more than time availability and rational choice" (Bianchi et al., 2000, p. 194). Again, we limit the discussion to general propositions associated with this view, which yield opposite empirical predictions about the relationship between grandparenting and market work, the effect of retirement, and cross-national variation in the gender gap in grandparenting.

The socialization/ideology hypothesis (e.g., Coverman, 1985) posits that the division of labor emerges from gender-role attitudes or "ideologies" internalized through socialization. Women are socialized into kinkeeper roles and are thus in charge of maintaining family relationships and performing various household tasks (Rosenthal, 1985). Later formulations added the doing gender hypothesis (West \& Zimmerman, 1987), stressing the symbolic enactment of gender in marital households, "where ongoing behavioral displays of masculinity and femininity become routinized within the institution of marriage" (Brines, 1994, p. 661). The performance of childcare tasks is assumed to signify the appropriate behavior of women, thus producing and reinforcing gender inequality in the division of labor. Note, however, that this applies primarily to activities related to minding babies and infants. As discussed above, tasks associated with grandparenting become less obviously gendered as the grandchild ages.

In contrast to gender-neutral economic perspectives, these accounts postulate that women will perform "female" tasks largely irrespective of their participation in the labor force. In other words, time constraints and opportunity costs in the labor market do not offset gender-role expectations in the home. As applied to grandparenting, grandmothers are expected to enact the caregiver role even if they are employed full time and regardless of whether this division of market and non-market work within the grandparent couple is economically efficient. Empirically, this view implies, first, a weak association between the share of childcare and market work within a grandparent couple (Hypothesis 2a). That is, the gender gap in grandparenting remains largely unexplained by a grandparent couple's division of market work. Second, because gender roles and their enactment are assumed to be fairly persistent across the life course, these theories give little reason to expect change in traditional divisions of domestic work. Thus, the gender gap in grandparenting should remain largely unaffected by the transition to retirement (Hypothesis 2b).

Finally, sociological perspectives draw attention to cultural differences in socially constructed gender roles. Beliefs about gender-appropriate behavior vary markedly across cultures and are reflected in numerous domains within a "societal gender system" (Mason, 1997). One aspect of this variation is illustrated by a prominent north-south gradient across Europe: egalitarian countries in the north show high levels of female labor force participation and a relatively small gender gap in the division of housework among older couples, whereas the reverse is true in traditional family regimes in southern Europe (Hank \& Jürges, 2007). In contrast to purely economic accounts, such a pattern is not seen to result simply from couples' rational division of market and non-market work. Instead, phenomena such as the gender gap in grandparenting are assumed to be profoundly affected by cultural differences in the framing of gender roles. Consequently, this gap should vary markedly across European countries even after a couple's division of market work is controlled (Hypothesis 2c).

## Data and Method

## Sample

We used panel data from the first two waves of the Survey of Health, Ageing and Retirement in Europe (SHARE, release 2.5.0). ${ }^{2}$ This cross-national survey was carried out in a total of 14 European countries and Israel. Probability samples representative of the non-institutionalized population aged 50 and over were drawn in each country. Wave 1 (2004 / 2005) included data on 31,115 respondents in 21,319 households, with a weighted average household response rate of $62 \%$. In Wave $2(2006$ / 2007), further countries and refreshment samples were added, increasing the sample size to 34,415 respondents in 23,565 households. For the purposes of this study, we focused only on respondents from countries that participated in both waves: Austria, Belgium, Denmark, France, Greece, Germany, Italy, the Netherlands, Spain, Sweden, and Switzerland.

Our unit of analysis was the grandparent couple. ${ }^{3}$ The SHARE data allowed us to study grandparents together as couples because all household members who had grandchildren were asked separately about their provision of childcare in the past year. For each wave, we selected an analytical sample of grandparent couples as follows. First, we constrained the sample to heterosexual couples who shared a household in which both partners completed the main questionnaire and one acted as the so-called family respondent ${ }^{4}$ ( $N=7,997$ couples in Wave $1 ; 8,215$ couples in Wave 2 ). Second, we selected only those ( $N=4,286$ in Wave $1 ; 4,436$ in Wave 2 ) who reported on at least one grandchild aged 12 or younger at the time of the interview of each wave. Third, because this study's outcome of interest, the gender gap in grandparenting, was predicated on at least some involvement in childcare, we limited the sample to couples in which one or both grandparents reported on looking after grandchildren in the past year.

After all these restrictions, we observed 2,958 grandparent couples in Wave 1 and 2,464 grandparent couples in Wave 2. In a final step, we pooled these samples into an analytical sample of 5,422 observations comprising 4,276 distinct grandparent couples. All descriptive and cross-sectional (between-couple) analyses were based on this pooled sample. For the longitudinal analysis modeling

[^1]change within couples, we used a subset of 1,146 couples that were observed in both waves, thus contributing a total of 2,292 observations to the pooled sample.

## Dependent variable: The gender gap in grandparenting

Table 1 presents an overview of all the variables used in the analysis. The outcome measure was based on the following survey question: "During the last twelve months, have you regularly or occasionally looked after [your grandchild/your grandchildren] without the presence of the parents?" Positive responses were followed up by two questions on the amount of childcare provided:
(1) On average, how often did you look after the child(ren) of [child name] in the last twelve months? Was it almost daily, almost every week, almost every month, or less often?
(2) About how many hours did you look after the child(ren) of [child name] [on a typical day/in a typical week/in a typical month/in the last twelve months]?
From these data, we calculated a couple's average weekly amount of grandparenting (in hours), provided to all of their grandchildren aged 12 or younger over the past year, using a coding scheme that converted all responses into weekly values (see Ghysels, 2011). Reports on "daily" hours were multiplied by 5, reports on "monthly" hours were divided by 4 , and reports on "less frequent" hours were divided by 52 . Subsequently, we calculated a couple's total grandparenting hours, adding up the grandfather's $\left(h_{g f}\right)$ and grandmother's $\left(h_{g m}\right)$ weekly hours of caring for all of their grandchildren aged 12 or younger. In a final step, we defined the outcome variable as grandfather's percentage share of this amount:
$G P S_{g f}=100 \times \frac{h_{g f}}{h_{g f}+h_{g m}}$. This ratio measure indicated the gender gap in grandparenting, ranging between 0 , if the grandmother was the single provider, and 100 , if the grandfather was the single provider.

## Explanatory variables: Division of market work and transitions to retirement

Our key explanatory variables were measures of each partner's involvement in paid employment (see Table 1 for details). Grandparents who were employed or self-employed reported on the weekly hours they usually worked in this job. For each partner, the total amount of work hours was added up ( $w_{g f}$, $w_{g m}$ ), including main jobs and, if applicable, secondary jobs. From this variable, we constructed a ratio measure analogous to the outcome variable, indicating the grandmother's percentage share of a couple's total work hours:
$W S_{g m}=100 \times \frac{w_{g m}}{w_{g m}+w_{g f}}$. This ratio variable ranged between 0 , if the grandfather was the single earner, and 100 , if the grandmother was the single earner. Grandparent couples in which at least one partner reported paid employment were defined as "working couples", whereas those who did not represented economically "inactive couples". ${ }^{5}$ Obviously, the share of market work was only defined for working couples. In the multivariate models, this variable was thus defaulted to zero for both partners if a couple was inactive. Inactive couples were identified by a binary variable. In the pooled sample, the majority of couples ( $63.2 \%$ ) were economically inactive. In $92.8 \%$ of these couples, the grandfather was retired. In most working couples ( $63.8 \%$ ), the grandfather was employed full time; 23.9 \% of working couples were dual full time earners.

- Table 1 -

[^2]For the longitudinal analysis, changes in a grandparent couple's amount and division of childcare, as well as changes in the share of market work, were captured by panel information on these variables. To investigate transitions to retirement, we used panel data on each grandparent's current job situation (retired, employed or self-employed, unemployed, homemaker). From the subset of grandparent couples observed in both waves ( $n=1,146$ ), approximately one in five ( $n=229$ ) changed their job status. For the longitudinal models, the most interesting group of couples were those who worked at Wave $1(n=464)$. Approximately a quarter of these couples ( $n=130$ ) changed their status to inactive at Wave 2.

## Cross-country variation

For the present study, the critical aspect of cross-country variation was the European diversity in gender-role ideology. Understood as a macro level force, this ideology is assumed to define genderappropriate behavior in various spheres including family and labor market. Mason (1997, p. 158) used the term societal gender system for "socially constructed expectations for male and female behavior (. . .) prescrib[ing] a division of labor and responsibilities between women and men." Research has shown that gender-role ideologies vary strongly across Europe, largely corresponding to a north-south gradient (Lück, 2006). Egalitarian countries are mostly located in northern Europe (Borchorst \& Siim, 2008; Bernhardt, Noack, \& Lyngstad, 2008 ), whereas traditional beliefs about gender roles are most prevalent in the south (González, Jurado, \& Naldini, 2000; Surkyn \& Lesthaeghe, 2004).

In a comparative study of career paths of couples, Blossfeld and Drobnič (2001) showed that employment patterns within couples became increasingly gendered over the course of marriage, particularly in Mediterranean welfare regimes (Italy and Spain). A similar divergence was found in conservative regimes (Germany, Netherlands, and Belgium), but not in social-democratic regimes, such as Denmark and Sweden. Thus, life-course trajectories of the gendered division of labor in couples vary substantially according to the institutional and cultural settings in which they unfold. With regard to grandparenting, the diversity among European countries is equally pronounced. Most notably, recent findings suggest that grandparents' childcare assistance was most prevalent but least intense in northern Europe, whereas the reverse pattern held in southern countries (Hank \& Buber, 2009).

Despite certain regularities in these cross-country differences - in particular between northern and southern European countries - it appeared unclear whether popular classifications (e.g., EspingAndersen, 1990; Ferrara, 1996; Korpi, 2000) would adequately capture the cultural and institutional contexts of gender and the division of labor in grandparent couples. Therefore, we did not assign countries to welfare, family or gender regimes in the present study, but introduced every country separately into the multivariate models, allowing for country-specific idiosyncrasies in the context of grandparenting.

## Controls

In the multivariate analyses, we controlled for a number of characteristics that may be associated with the outcome measure, the gender gap in grandparenting, and the explanatory variables. One obvious factor was the age of the grandchild. Research has shown that grandmothers were even more involved with younger grandchildren (Spitze \& Ward, 1998). Thus, a potential reduction of the gender gap over time (e.g., after retirement) might simply result from changes in the grandchild's developmental needs.

Other relevant aspects were grandparents' age and education. Progressive attitudes about gender and equal sharing of domestic work were found to be more prevalent among highly educated people who, in turn, were also more likely to be dual earners (Baxter et al., 2005). The same may apply to younger grandparent couples. To account for confounding effects of education, we used a binary
variable indicating whether at least one partner had a higher level education (ISCED ${ }^{6}$ level 4 or higher; see Hank \& Jürges 2007). We also considered age-related changes in grandparenting, introducing the mean age of both partners as a control. A further concern was geographical distance: time constraints of those who worked may have been aggravated by distance as a barrier to provide childcare. Our control variable for distance was aggregated over all grandchildren, indicating whether the nearest grandchild resided within a radius of five kilometers from the grandparent couple's household.

As our analytical focus was on how grandparent couples divided childcare, rather than the amount of their investment, we added a control for the total hours of grandparenting provided by the couple (see Craig \& Mullan, 2011). ${ }^{7}$ The provision of childcare may also be related to issues of kinship and biological relatedness. Thus, we used an indicator variable for whether the youngest grandchild's parent was a biological child of the grandfather. Finally, health problems of one or both partners might have interfered with their ability to look after grandchildren. To control for grandparents' health, we used a set of dummy variables for whether only the grandfather, only the grandmother, both partners, or none of them reported to be permanently sick, disabled, and/or to have at least one limitation in activities of daily living. Table 1 provides a summary of all control variables.

## Statistical models

We estimated two types of linear models. ${ }^{8}$ First, we pooled data from both waves drawing on information from the total sample of grandparent couples. We applied linear regression with clusterrobust standard errors to account for the non-independence of observations within couples $(5,422$ couple observations nested in 4,276 couples). ${ }^{9}$

Second, we used fixed-effects regression models (Allison, 2009) to analyze change over time in the grandfather's share of childcare within the same couple. These models estimated the effect of changes in a couple's division of market work on changes in their division of childcare. By subtracting the within-couple means over time from both sides of the regression equation ("within transformation"), the fixed effects model related variation in the outcome only to variation in the explanatory variables. The key advantage of a fixed-effects approach was that all time-constant heterogeneity, even if unobserved, was canceled out of the equation and thus did not affect the estimates. By definition, only couples observed at both waves $(N=1,146)$, and only variables that varied within couples, entered the fixed-effects model.

## Results

## Descriptive results

The data shown in Table 2 present a descriptive overview of the gender gap in grandparenting as well as gender differences in market work in the 11 European countries represented in our sample. Among

[^3]working couples, grandfathers were the main providers of market work in all countries except Sweden. The average grandfather spent 31.5 hours per week in paid employment, compared to 23.2 hours among working grandmothers. Within working couples, grandfathers' average share of total hours spent in paid employment amounted to $55 \% .^{10}$ Across countries, these work shares largely corresponded to a north-south gradient, averaging at around $50 \%$ in the north compared to almost $70 \%$ in the south of Europe.

The reverse pattern held for grandfathers' share of grandparenting among working couples: grandfathers provided less childcare than grandmothers in all countries, averaging at approximately 6.9 hours per week - compared to 10.7 hours among grandmothers. Again, grandfathers' shares of grandparenting revealed a north-south gradient across Europe: the highest shares were found in egalitarian countries such as Denmark and Sweden, whereas those in traditional countries such as Greece, Italy, and Spain were among the lowest. Note, however, that the gradient reversed when looking at the intensity of grandparenting. In southern Europe, grandparents invested considerable more time in childcare compared to their northern counterparts (see Hank \& Buber, 2009). Thus, despite their lower share within couples, grandfathers from traditional countries still spent more hours looking after their grandchildren than those from egalitarian countries in northern Europe.

- Table 2 -

Among working couples, grandfathers' average share of childcare provision amounted to $36.5 \%$, reflecting a sizable gender gap in grandparenting. Among inactive couples, this gap was also present, albeit less pronounced with an overall grandfather share of $39.9 \%$. A further notable difference between inactive and working couples concerned the intensity of grandparenting: with an average weekly provision of 21.4 hours, inactive couples' investment exceeded that of working couples (17.6 hours) by more than $20 \%$.

Taken together, the descriptive results from Table 2 seemingly support gender-neutral accounts, suggesting, first, that paid employment and grandparenting were traded off within working couples; second, that the gender gap in grandparenting declined after retirement; and third, that international variation in this gender gap appeared to correspond largely to cross-country differences in the gendered division of market work.

- Figure 1 -

Figure 1 further illustrates these associations, plotting selected findings from Table 2. In the left panel for working couples, the bars indicate grandmothers' and grandfathers' average hours of grandparenting. The lines show grandmothers' average share of grandparenting and grandfathers' average share of market work, respectively. Looking at the main pattern across countries, the largely parallel trajectories of these lines suggested a striking association: the higher the grandmothers' share of market work, the higher was the grandfathers' share of grandparenting (and vice versa). Consistent with this pattern, the level of the solid line was lower in the right panel for inactive couples, illustrating how the gender gap in grandparenting declined, at least to some extent, in the absence of market work.

[^4]
## Multivariate results

The results of the multivariate analysis are presented in Table 3. Model 1a and Model 1b are linear regression models estimating the grandfather's share of a couple's total amount of grandparenting. Our key explanatory variables measured a couple's activity status (working vs. inactive) and, if applicable, division of market work indicated by the grandmother's share of a couple's total work hours. We first excluded these variables, estimating a baseline model as a comparative reference (Model 1a). In a second step, both variables were added to the equation (Model 1b).

For cross-country comparison, we employed an effect coding approach. Compared to dummy coding, effect coding yielded two analytical benefits that facilitated the interpretation of differences between the 11 countries included in our sample. First, effect-coded country coefficients were independent of which country was selected as a reference group. Second, effect coding enabled us to obtain estimates for all countries, indicating deviation from the unweighted grand mean (i.e., the mean over country means) instead of deviation from an omitted group. ${ }^{11}$ The controls were also centered at their unweighted grand means to allow for a consistent interpretation of the constant. The only exceptions were the controls for health limitations which were dummy-coded with healthy couples as the reference group.

## - Table 3 -

Model 1a estimated the grandfather's share of grandparenting irrespective of a couple's activity status and division of market work. According to our specification, the constant indicated the grandfather's share of grandparenting in healthy couples averaged over the grand means of all countries and remaining controls. Under these conditions, representing the "average couple" in Europe, grandfathers provided approximately $38 \%$ of the total grandparenting hours.

In Model 1b, the interpretation of the constant changed after introducing our key explanatory variables. Because these variables were not centered, the constant was now an estimate for the grandfather's share of grandparenting, if he was the single earner (i.e., the grandmother's share of market work equaled 0 ) of a working couple (i.e., the indicator variable for inactive couples equaled 0 ). Under these conditions, representing male breadwinner couples, the grandfather's share of grandparenting dropped to $30.4 \%$.

The measure of the grandmother's share of market work provided an estimate of a grandparent couple's trade-off between grandparenting and paid employment. Its positive and highly significant coefficient indicated that the division of market work was an important factor in explaining the gender gap in grandparenting. The strong association suggested by the macro level findings of the descriptive analysis, however, turned out to be rather weak at the micro level of grandparent couples. For each percentage point of increase in the grandmother's share of market work, the grandfather's share of grandparenting increased only by 0.12 percentage points. Compared to male breadwinner couples, the grandfather's estimated share of grandparenting thus increased by $6.2(0.124 \times 50)$ percentage points to $36.6 \%(30.4+6.2)$, if the couple's division of market work was equal. If the grandmother was the single earner, this share further increased to an estimated maximum of $42.8 \%$, all else being equal. That is, even if grandmothers performed all the market work, they remained primary providers of grandparenting. Overall, these results, indicating a modest trade-off between market work and grandparenting, were consistent with Hypothesis 2a rather than Hypothesis 1a, supporting gender-role theories of the division of labor.

In contrast, the indicator variable for whether a grandparent couple was inactive corroborated the descriptive evidence, pointing to a smaller gender gap in grandparenting after retirement.

[^5]Compared to male breadwinner couples, the grandfather's share of grandparenting increased markedly by almost 9 percentage points if a couple was inactive. In these couples, grandfathers' contributions accounted for approximately $39.4 \%$ of the total hours of grandparenting. Unlike the results on the trade-off between the share of market work and grandparenting, this indication of marked convergence after retirement appeared to support gender-neutral economic accounts (Hypothesis 1b), rather than gender-role theories (Hypothesis 2b) of the division of labor.

Note, however, that Model 1b provided only cross-sectional estimates relying on betweencouple differences. As a result, the coefficients of both key explanatory variables might be biased if important unobserved factors such as attitudes toward childcare and market work were not controlled. In this respect, the fixed-effects regression (Model 2) provided more reliable estimates of their effects, netting out all time-constant heterogeneity between couples. This model predicted change in grandfathers' share of grandparenting, within couples across waves, dropping time-constant variables from the equation (i.e., fixing couple effects).

The effects of change in a couple's division of market work and in a couple's activity status, presented in Model 2, strongly supported the preceding findings. As indicated by the constant, grandfathers who were single earners provided less than a third ( $31.9 \%$ ) of a couple's total hours of grandparenting. This share increased, on average, by only 0.11 percentage points with every percentage point increase in the grandmother's share of market work. This effect closely resembled the corresponding cross-sectional estimate, further supporting Hypothesis 2a. ${ }^{12}$ If a male breadwinner retired between Wave 1 and Wave 2, his share of grandparenting changed substantially, rising by 9.9 percentage points from $31.9 \%$ to $41.8 \%$ - an increase of more than $30 \%$. Compared to the betweencouple estimate, this effect was even more pronounced and thus consistent with Hypothesis 1b. Further analyses on each partner's amount of grandparenting hours (available upon request) revealed that this rising share resulted from an increase of grandfathers' total hours - rather than a decrease of grandmothers' hours.

- Figure 2 -

Finally, we return to the pooled regression models to evaluate our hypotheses about cross-country differences. The country effects are illustrated by Figure 2 which plots each coefficient conditional on the covariates of Model 1a (diamonds) and Model 1b (circles). Overall, the results supported the descriptive evidence, suggesting that the gender gap in grandparenting varied according to the societal framing of gender roles. Again, the main pattern of findings was in line with a geographical gradient across Europe, with egalitarian countries in the north and traditional countries in the south. In Denmark, for example, the grandfather's share of grandparenting was estimated more than 6 percentage points above the grand mean, whereas the corresponding estimate of Italy was more than 8 percentage points below the European average. The comparison between diamonds and circles in Figure 2 shows that cross-country differences remained almost unchanged after introducing the measures of a couple's division of labor and activity status in Model 1b. Grandfathers in Greece, Italy, and Spain, for instance, still fell short of the average share of grandparenting even when controlling for their high share of market work in these countries. These results supported Hypothesis 2c, suggesting that the magnitude of the gender gap in grandparenting corresponded to the cultural framing of gender roles, net of a couple's actual division of market work.

The controls showed a decline of the gender gap in grandparenting with increasing education, age of grandchild, and total hours of grandparenting provided by the couple. These findings were in

[^6]line with previous research on parenting and grandparenting, indicating more progressive gender attitudes as well as a higher prevalence of equal sharing of domestic tasks among highly educated people (Baxter et al., 2005); greater involvement of grandfathers if the grandchild was beyond infancy (see Spitze \& Ward, 1998); and a declining gender gap in routine childcare with increasing hours of parenting (Craig \& Mullan, 2011). The control for a grandparent couple's mean age suggested that couples also became more egalitarian with age (Model 1a). This effect, however, was entirely explained by a couple's division of market work and activity status (Model 1b). The gender gap in grandparenting varied also with biological relatedness and geographical distance. A smaller share of grandfathers' time, and thus a greater gender gap, was found if the youngest grandchild was nonbiological and lived geographically close. Finally, the indicators for health limitations showed the expected relationships. Compared to couples in which neither partner had limitations, the gender gap was greater if the grandfather was in worse health than the grandmother and substantially smaller in the opposite case.

## Discussion

This study aimed to advance the understanding of gender differences in grandparenting: why do grandmothers provide far more childcare than grandfathers do? Given the pervasiveness of this gender gap, the literature was surprisingly mute with regard to the mechanisms that may produce it. Our purpose was to examine one of these mechanisms: a grandparent couple's division of labor into market and non-market work.

We outlined two broad theoretical perspectives on the gender gap in grandparenting. Genderneutral accounts emphasized availability and choice in a grandparent couple's rational allocation of tasks, thus expecting a strong trade-off between grandparenting and market work, a decline in the gender gap after retirement, and little cross-country variation net of a couple's division of market work. In contrast, gender-role theories were consistent with a weak trade-off, persistence after retirement, and marked variation across cultural contexts.

The results did not yield unequivocal support in favor of one perspective. On the one hand, both cross-sectional and longitudinal (fixed-effects) models suggested that although childcare was exchanged against market work within grandparent couples, the trade-off was relatively weak. Overall, grandmothers and grandfathers traded off their share in both domains roughly on a one-foreight basis. In working couples, grandfathers' estimated share of the total hours of grandparenting varied between $30 \%$ in male breadwinner households and $43 \%$ if the grandmother was the single earner. Thus, grandmothers remained primary providers of childcare even if they were the sole breadwinners. Gender-role theories of the division of labor were further corroborated by the crossnational evidence. As the gender gap in grandparenting was most pronounced traditional countries of southern Europe and least pronounced in the egalitarian north, its magnitude appeared to be associated the societal framing of gender roles. These differences remained unexplained by cross-country variation in grandmothers' share of market work.

On the other hand, we observed a strong decline in the gender gap after retirement, supporting economic accounts according to which fewer time constraints and less need for the specialization of tasks will lead to a more equal division of domestic work. Most notably, fixed-effects regressions estimated that grandfathers who were the sole breadwinners increased their share of a couple's total provision of childcare by more than $30 \%$ after relinquishing their work role. This result was clearly at odds with gender-role theories that assume persistence in household roles over the life course. It might still be reconciled with a sociological perspective, however, as alternative views do exist, positing a "normal unisex of later life" (Gutmann, 1975). According to this hypothesis, the polarization of gender roles declines over time, following changes in other roles and an overall reduction of the role set to a few salient ones (Carstensen, 1992; Spitze \& Ward, 1998). As suggested by Kivett (1991, p. 274),
grandparenthood may offer "individuals, especially men who were busily involved in earlier years, a second chance at parenting."

The substantial narrowing of the gender gap in grandparenting after retirement is perhaps the most striking finding of the present study. This evidence appears to contradict studies that examined post-retirement change in men's and women's domestic labor. Although cross-sectional analyses have produced a somewhat inconsistent empirical picture, most studies reported little change after retirement (Dorfman, 1992; Hank \& Jürges, 2007). The few longitudinal studies that exist also suggested continuity in the traditional division of domestic labor (Szinovacz, 2000; Solomon, Acock, \& Walker, 2004). Yet it is important to note that these analyses focused on different outcomes, namely, measures of housework such as cleaning, cooking, shopping, and making repairs. A recent study looking at individual change in the care of grandchildren, in contrast, discovered that married men increased their contributions after retirement, even eliminating any gender differences (Kahn, McGill, \& Bianchi, 2011).

We suggest that these uneven patterns of post-retirement change - persistence of the gender gap in housework, convergence of the gender gap in grandparenting - reflect conceptual differences between these activities. As discussed in the background, important aspects of grandparenting are distinct. Compared to routine housework, looking after grandchildren represents an activity that is more meaningful, less burdensome, less compatible with work schedules, and - as grandchildren age less "feminine." Still, gender differences in the enactment of the grandparent role remain stark. The salience of this role, however, does not differ between grandmothers and grandfathers (Silverstein \& Marenco, 2001). Furthermore, identification with the grandparent role was found to increase with age, particularly after the loss of other roles (Carstensen, 1992). In light of this, it is interesting to note that our model on post-retirement change in grandparenting was predicated on grandfathers relinquishing their role of sole breadwinner.

This study has a number of limitations that warrant future investigation. First, our data precluded disaggregated assessments of the types of childcare that grandmothers and grandfathers provided. A coarse measure of each grandparent's amount of childcare in hours, however, may conceal important gender differences in specific tasks. This has been clearly demonstrated by research on parenting, revealing that men frequently engaged in leisure activities with the child, rather than performing routine tasks (Craig \& Mullan, 2011). In a similar vein, the narrowing of the gender gap in grandparenting after retirement might result from grandfathers more frequently joining in recreational activities with their grandchildren.

Second, relying on each partner's separate reports of grandparenting, we also lacked information about whether grandmothers and grandfathers cared solo or whether they acted together. Again, research on parenting has highlighted notable gender differences in this respect. A large proportion of fathers' care was co-provided with their spouses, whereas the reverse was true for mothers (Craig, 2006). Grandparent research has also suggested that grandfathers' contributions may be contingent on grandmothers' provision of childcare (Dench \& Ogg, 2002; Hank \& Buber, 2009). Obviously, the context and experiences of grandparenting - both for the older and younger generation - are very different, depending on whether grandparents act together or care solo. Grandparenting, for instance, may be a more pleasant experience for grandfathers, who engage only in recreational activities, requiring little alertness while co-providing grandmothers shoulder more demanding tasks.

Third, as our research focus was on the trade-off between grandparenting and market work, we employed relative measures of each partner's involvement in both activities. This analytical approach, concentrating on shares instead of amounts, allowed testing our hypotheses on the gender gap in grandparenting, but relegated a number of important aspects to future investigation. Our models, for example, did not identify similar increases or decreases in both partners' amounts of grandparenting and/or work hours, although studying the sources of such simultaneous shifts might be worthwhile. Also, an increase in the grandmother's share of market work could result from an actual increase in her work hours, a decrease in her partner's work hours, or both. More differentiated assessments will
allow assessing the effects of changes in the participation of older people in the workforce, and the associated gender differences, in greater detail.

These limitations point to the substantial gaps in knowledge about grandparenting - and the potential of future research, replacing the isolated view endorsed by previous grandparent research with a couple perspective. How often, and under what conditions, do grandparents act together or solo as providers of childcare? How are grandparenting tasks allocated and specific competencies combined? What are the effects of solo grandparenting compared to joint provision on outcomes such as stress and the well-being of the elderly, as well as the later quality of multigenerational bonds? In addressing these questions, research on grandparenting would provide a more nuanced, and more realistic, picture of a phenomenon that is so frequently situated within a couple context.

As shown by this investigation, the gender gap in grandparenting was sizable even if both partners worked full time. In view of the projected increase in the proportion of dual full-time earners among older couples and the continuing demand for grandparents as providers of regular childcare, this finding suggests growing pressures on grandmothers. Policies aimed at promoting public childcare and family-friendly workplaces may thus increase the participation of women in the labor force in both generations. Promoting grandparent leaves, in contrast, may exacerbate gender specialization by providing incentives for grandmothers, rather than grandfathers, to leave the workforce.

In view of these connections, our study's contribution reaches beyond advancing the understanding of gender differences in grandparenting. We conclude by highlighting three perspectives for future research. First, our study has directed attention to the employment-family nexus in later life; this is still an understudied topic, particularly when considering its increasing demographic importance. Second, there are numerous benefits of longitudinal research on grandparenting. Although this has been recognized by recent studies (e.g., Luo, LaPierre, Hughes, \& Waite, 2012), we still know too little about continuity and change in grandparenting. Third, grandparenting is often an activity performed by a grandparent couple as a unit of interacting providers. Investigating grandparenting in the way it is actually experienced in families, thus requires complementing the isolated view of the grandparent with a couple perspective. In addition, a comprehensive view on grandparent couples as well as single, remarried, divorced, and widowed grandparents would provide additional insight into the gender gap in grandparenting.

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Figure 1. Total Hours and Share of Grandparenting and Market Work


Note: Data are from SHARE Waves 1 and 2, Release 2.5.0.; unweighted. $N=5,422$ grandparent couples comprising two respondents who are spouses or partners, live together, and have at least one grandchild aged 12 or younger ( $n=2,958$ at Wave $1 ; n=2,464$ at Wave 2 ). $\mathrm{GM}=$ grandmother, $\mathrm{GF}=$ grandfather.

Figure 2. Country Effects Plots Conditional on Covariates


Note: Data are from SHARE Waves 1 and 2, Release 2.5.0.; unweighted. Effects are deviations from the unweighted grand mean, conditional on covariates from Model 1a and Model 1b. $N=5,422$ grandparent couples comprising two respondents who are spouses or partners, live together, and have at least one grandchild aged 12 or younger ( $n=2,958$ at Wave $1 ; n=2,464$ at Wave 2 ).

Table 1. Variables and Descriptive Statistics

| Variables | Wave 1 |  | Wave 2 |  | Range | Description |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | M | $S D$ | M | $S D$ |  |  |
| Grandparenting |  |  |  |  |  |  |
| Total grandparenting hours | 19.34 | 23.97 | 19.98 | 23.94 | .02-120 | Total hours per week of looking after grandchildren in the absence of parents; summed over all of the couple's selected grandchildren (top-coded to 120) |
| Grandfather's share of grandparenting | 38.85 | 29.44 | 38.36 | 29.08 | 0-100 | Grandfather's share of a couple's total grandparenting hours (in \%) |
| Employment |  |  |  |  |  |  |
| Total work hours | 55.20 | 28.42 | 54.10 | 26.98 | 0-168 | Total amount of market work performed by the grandparent couple (in hours per week); for each spouse, job hours of primary and, if applicable, secondary job were added up; only defined for working couples |
| Grandmother's share of market work | 44.21 | 37.49 | 46.06 | 37.33 | 0-100 | Grandmother's share of a couple's total amount of market work (in \%); only defined for working couples |
| Inactive / retired couple | . 63 |  | . 64 |  | $0-1$ | 1 = no partner was (self-)employed |
| Controls |  |  |  |  |  |  |
| Mean age | 62.64 | 6.94 | 63.40 | 6.90 | 42-88 | Sum of both partners' age at the time of interview divided by 2 |
| High education | . 28 |  | . 31 |  | $0-1$ | $1=$ at least one partner has at least some post-secondary education (ISCED > 3) |
| Short distance | . 55 |  | . 55 |  | 0-1 | $1=$ couple lives 5 or less kilometers ${ }^{\text {a }}$ from closest grandchild |
| Grandchild's age | 3.42 | 3.13 | 3.48 | 3.22 | 0-12 | Age of a couple's youngest grandchild |
| Grandchild nonbiological | . 06 |  | . 06 |  | $0-1$ | 1 = youngest grandchild does not descend from grandfather |
| Health limitations |  |  |  |  |  | Being permanently sick, disabled, and/or reporting at least one limitation in activities of daily living |
| None (ref.) | . 84 |  | . 84 |  | 0-1 | $1=$ neither partner reported limitations |
| Only GF | . 08 |  | . 08 |  | 0-1 | $1=$ only GF reported limitations |
| Only GM | . 06 |  | . 06 |  | 0-1 | $1=$ only GM reported limitations |
| Both | . 01 |  | . 02 |  | 0-1 | $1=$ both partners reported limitations |

Note: Data are from SHARE Waves 1 and 2, Release 2.5.0.; unweighted. $N=5,422$ grandparent couples comprising two respondents who are spouses or partners, live together, and have at least one grandchild aged 12 or younger ( $n=2,958$ at Wave $1 ; n=2,464$ at Wave 2 ). ISCED $=$ International Standard Classification of Education. ${ }^{\mathrm{a}} 1 \mathrm{~km} \approx 0.621$ miles. $\mathrm{GM}=$ grandmother, $\mathrm{GF}=$ grandfather.

Table 2. Working and Grandparenting in 11 European Countries

|  |  |  | Working couples ( $n=1,995$ ) |  |  |  |  |  | Inactive / retired couples ( $n=3,427$ ) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Market work |  |  | Grandparenting |  |  | Grandparenting |  |  |  |
|  |  | \% of all | Hours | week | Share (\%) | Hours | week | Share (\%) | \% of all | Hour | week | Share (\%) |
| Country | $N$ | couples | GF | GM | GF | GF | GM | GF | couples | GF | GM | GF |
| Sweden | 659 | 51.90 | 26.99 | 32.04 | 42.45 | 4.30 | 5.42 | 41.24 | 48.10 | 4.86 | 5.68 | 40.03 |
| Denmark | 572 | 51.05 | 33.23 | 28.08 | 51.95 | 4.55 | 6.02 | 41.87 | 48.95 | 5.66 | 5.53 | 44.19 |
| Netherlands | 675 | 34.07 | 30.44 | 15.63 | 60.83 | 4.13 | 8.04 | 31.08 | 65.93 | 6.33 | 8.04 | 42.65 |
| Belgium | 814 | 35.63 | 33.06 | 18.22 | 61.32 | 10.77 | 15.05 | 36.67 | 64.37 | 11.63 | 12.62 | 46.10 |
| Germany | 493 | 40.97 | 32.70 | 25.15 | 51.46 | 6.75 | 8.60 | 35.12 | 59.03 | 7.27 | 9.71 | 37.62 |
| France | 611 | 37.97 | 28.60 | 26.35 | 46.42 | 9.01 | 12.92 | 37.24 | 62.03 | 9.77 | 13.36 | 40.06 |
| Austria | 229 | 28.38 | 37.79 | 22.06 | 59.31 | 6.87 | 12.07 | 31.50 | 71.62 | 9.16 | 12.67 | 36.86 |
| Switzerland | 157 | 45.22 | 39.34 | 22.99 | 63.18 | 5.75 | 8.44 | 39.03 | 54.78 | 10.37 | 10.44 | 45.83 |
| Italy | 471 | 18.68 | 31.53 | 14.68 | 66.40 | 5.56 | 13.19 | 24.71 | 81.32 | 10.34 | 17.97 | 30.97 |
| Spain | 307 | 18.24 | 33.38 | 11.21 | 72.54 | 6.34 | 16.10 | 32.08 | 81.76 | 10.26 | 14.54 | 35.31 |
| Greece | 434 | 29.26 | 33.46 | 15.95 | 69.17 | 14.27 | 25.75 | 33.19 | 70.74 | 15.59 | 22.15 | 37.61 |
| Total | 5,422 | 36.79 | 31.53 | 23.18 | 54.96 | 6.94 | 10.67 | 36.52 | 63.21 | 9.21 | 12.18 | 39.86 |

Note: Data are from SHARE Waves 1 and 2, Release 2.5.0.; unweighted. $N=5,422$ grandparent couples comprising two respondents who are spouses or partners, live together, and have at least one grandchild aged 12 or younger ( $n=2,958$ at Wave $1 ; n=2,464$ at Wave 2 ). $\mathrm{GM}=$ grandmother, $\mathrm{GF}=$ grandfather.

Table 3. Pooled and Fixed-Effects Regression Models


Note: Data are from SHARE Waves 1 and 2, Release 2.5.0. Linear regression coefficients are shown. Standard errors in parentheses. All predictor variables centered at the unweighted grand mean except grandmother's share of market work, the indicator variable for inactive / retired couples, and the indicator variables for health limitations. See Table 1 for details on the variables. $\mathrm{GF}=$ grandfather, $\mathrm{GM}=$ grandmother. ${ }^{\text {a }}$ Cluster-robust standard errors. ${ }^{\mathrm{b}}$ Only defined for working couples (set to 0 for inactive/retired couples). ${ }^{\mathrm{c}}$ Tests are for deviation from the unweighted grand mean. ${ }^{*} \mathrm{p}<.05$. $^{* *} \mathrm{p}<.01 .^{* * *} \mathrm{p}<.001$.


[^0]:    ${ }^{1}$ Throughout this paper, we use the terms grandparenting, childcare, childcare assistance, and looking after grandchildren as synonyms.

[^1]:    ${ }^{2}$ This paper used data from SHARE release 2.5 .0 , as of May 24th 2011. The SHARE data collection has been primarily funded by the European Commission through the 5th framework programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life), through the 6th framework programme (projects SHARE-I3, RII-CT- 2006062193, COMPARE, CIT5-CT-2005-028857, and SHARELIFE, CIT4-CT-2006-028812) and through the 7th framework programme (SHARE-PREP, 211909 and SHARE-LEAP, 227822). Additional funding from the U.S. National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, Y1-AG-4553-01 and OGHA 04-064, IAG BSR06-11, R21 AG025169) as well as from various national sources is gratefully acknowledged (see www.shareproject.org for a full list of funding institutions).
    ${ }^{3}$ The SHARE collected detailed proxy information on up to four of the respondent's children. We temporarily expanded the dataset to dyads between grandparent couples and up to four of their children to compute a compound measure of childcare provided to all grandchildren. In our empirical models, we did not draw on dyadic data because these could obscure the gender gap in grandparenting. For example, if the grandmother invested 10 hours to look after the child of the couple's daughter while the grandfather invested 10 hours to look after the child of the couple's son, a composite measure aggregated over the couple was required to identify the absence of a gender gap. The drawback of using the grandparent couple as a unit of analysis was that we were unable to introduce covariates at child level such as age, gender, education, and marital status of the child. To test the robustness of our multivariate findings, we re-ran all analyses on an expanded dataset of dyads between grandparent couples and up to four of their children. Regarding the gender gap, all findings were robust and all controls at child level inconsequential. The one exceptions were geographical distance and biological kinship. Therefore, we introduced an aggregated measure of geographical distance to the most proximate grandchild as well as a measure for whether the youngest grandchild descended from the grandfather into the equations (see below).
    ${ }^{4}$ The family respondent in a household is selected by design and reports on family issues such as characteristics of children and grandchildren.

[^2]:    ${ }^{5}$ We used a strict definition of inactive couples covering only those in which both partners reported 0 hours of paid work. We conducted sensitivity analyses (not shown) using less strict definitions of inactive couples, allowing, for example, a total amount of 10 work hours. All results reported in the multivariate analysis were robust.

[^3]:    ${ }^{6}$ In the SHARE data, educational levels of respondents were coded according to the International Standard Classification of Education from 1997 (ISCED-97, see SHARE release guide 2.5).
    ${ }^{7}$ This variable was top-coded to a maximum of 120 hours per week.
    ${ }^{8}$ Linear models are easy to interpret but allow the outcome variable to take predicted values below $0 \%$ and above $100 \%$. Fractional logit models (Papke \& Wooldridge, 1996) would remedy this problem by restricting the outcome variable to values between 0 and 1 . To test the robustness of our linear specification, we re-ran all models using a logit transformation of the outcome variable (divided by 100 , with zeros set to 0.0001 and ones set to .9999 ). These fractional logit models yielded very similar results.
    ${ }^{9}$ This approach only considers non-independence at couple level, disregarding non-independence of observations at country level. However, all findings were robust to using a multilevel specification that modeled the variance at both levels.

[^4]:    ${ }^{10}$ Note that average work hours were averaged over all grandfathers and grandmothers, respectively. The average work share, in contrast, represented the average of all shares within couples. It follows that the average share did not equal the share of the averages: $n^{-1} \sum_{i}^{n} \frac{h_{g f}^{i}}{h_{g}^{i}+h_{g m}^{i}} \neq \frac{n^{-1} \sum_{i}^{n} h_{g f}^{i}}{n^{-1} \sum_{i}^{n} h_{g f}^{i}+n^{-1} \sum_{i}^{n} h_{g m}^{i}}$. Thus, the average work share within couples could not be calculated from the average work hours of grafdmothers and grandfathers. The same applies to average hours and average share of grandparenting. This point further underlines the importance of a couple-based approach to investigate the gender gap in grandparenting.

[^5]:    ${ }^{11}$ We centered at the unweighted grand mean instead of the overall sample mean because country samples were unbalanced. Austria was the reference group in the estimation. The country coefficient for Austria was calculated subsequently as the sum of the remaining country coefficients multiplied by -1 (for a similar approach, see Hank \& Buber, 2009).

[^6]:    12 We conducted sensitivity analyses to test whether this relationship varied according to different employment configurations and total work hours, particularly between part-time and full-time working couples. The results did not indicate any differences. Therefore, we present the most parsimonious specification, estimating a joint model for fulltime and part-time working couples and measuring change in market work by a linear ratio variable.

