Evolution and Human Behavior 42 (2021) 343–350

Contents lists available at ScienceDirect

Evolution and Human Behavior

journal homepage: www.elsevier.com/locate/ens

A Cinderella effect in the childcare assistance provided by European grandparents

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ARTICLE INFO

Keywords:
Alloparental care
Childcare
Cinderella effect
Grandmothers
Grandparents
Stepfamilies

ABSTRACT

Survey data from 36,771 European grandparents were analyzed with respect to childcare assistance that interviewees provided to their birth children *versus* stepchildren. Interviewees with current partners provided far more such assistance to adult children who were the progeny of both partners than to those who were stepchildren of either one's self or one's partner, but both husband and wife helped the wife's children from prior unions more than they helped the husband's children, supporting the interpretation of stepfathers' involvement as primarily an investment in the new partnership ("mating effort") rather than in the grandchildren. Interviewees resided farther away from their adult stepchildren than from their birth children, on average, but discriminative care did not depend merely on residential proximity, being substantial regardless of whether proximity was statistically controlled. Grandmothers without current partners exhibited the greatest discrimination, with stepchild: birth child Odds Ratios of 0.10 or less in various analyses, whereas grandfathers without partners exhibited no significant discrimination. Interviewees of both sexes listed far more stepchildren, proportionately, if they had a current partner than if they were either widowed or divorced, however, which suggests that single respondents may have omitted former stepchildren with whom they had ceased to interact from their list of children, and hence that the degree to which single grandparents divest from them may be even larger than estimated.

1. Introduction

Animals that care for young use various cues to ensure that their parental efforts selectively benefit their genetic offspring (Lack, 1948; Daly & Wilson, 1988; Clutton-Brock, 1991). Care by others ("alloparents") is also directed mainly to close genetic relatives (Hrdy, 2009). A major exception to this generalization, however, is provided by "stepparents", who provide care and resources to young that their current mates produced with previous partners. Stepparental investment is apparently peculiar to species with long-lasting pair bonds, and has been interpreted as a form of "mating effort" in the sense that it is a component of the reciprocities involved in cementing a new partnership (Rohwer, 1986; Rohwer, Herron, & Daly, 1999).

Homo sapiens is one such stepparenting species, and is probably unique in the extent to which mutually supportive and affectionate steprelationships may persist beyond juvenile dependency. Nevertheless, stepchildren are recipients of less investment than genetic children, on average (*e.g.*, White, 1994; Case, Lin, & McLanahan, 2000; Zvoch, 1999; Case & Paxson, 2001; Erixson & Ohlsson, 2019; Wiemers, Seltzer, Schoeni, Hotz, & Bianchi, 2019), and are abused and exploited at higher rates (Daly & Wilson, 2008). These "Cinderella effects" imply that accepting the role of stepparent is not, in itself, sufficient to inspire parental levels of commitment, a conclusion that is reinforced by evidence that all contact between former stepparents and stepchildren often ceases if the parental relationship that linked them ends in death or divorce (*e.g.*Noël-Miller, 2013; Sanner, Coleman, & Ganong, 2018).

The domain of help investigated here is grandparental childcare (Buchanan & Rotkirch, 2018; Coall & Hertwig, 2010; Hrdy, 2009; Tanskanen & Danielsbacka, 2018). An obvious prediction is that grandparents will provide more care for the children of their birth children than for those of their stepchildren, but there are both theoretical and empirical reasons to anticipate that the birth child/stepchild distinction may not affect grandmothers and grandfathers identically. Theories grounded in the peculiarities of human life histories suggest that grandmothering has been a specific target of selection (Hawkes & Coxworth, 2013; Hawkes, O'Connell, & Blurton Jones, 1997; Hrdy,

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https://doi.org/10.1016/j.evolhumbehav.2021.01.001
Received 10 October 2020; Received in revised form 8 January 2021; Accepted 12 January 2021
Available online 3 February 2021

2009; Kramer, 2010), but provide little basis for suggesting the same about grandfathering. Empirically, it has been observed that men are both quicker and more likely to remarry after divorce than women (Coleman, Ganong, & Fine, 2000; Meggiolaro & Ongaro, 2008), and that those who then become stepfathers often stop supporting children who remain with their ex-wives and redirect investment to their new families (Anderson, Kaplan, Lam, & Lancaster, 1999; Anderson, Kaplan, & Lancaster, 1999; Gray & Brogdon, 2017; Hofferth & Anderson, 2003; Pashos, Schwarz, & Bjorklund, 2016), observations which accord with the idea that ostensibly "paternal" investment is largely undertaken as an investment in the man's current partnership. These facts and interpretations suggest the following hypotheses:

(1) Grandparents will provide more childcare assistance to their birth children than to their stepchildren.
(2) This preference for birth children will be stronger among grandmothers than grandfathers.
(3) The preference for birth children may be absent or even reversed among men whose current partners are the mothers of their stepchildren.
(4) The preference for birth children will be stronger among grandparents who have no current partner than among those who still live with the relevant child's other parent.

Ease of access to grandchildren is clearly affected by residential proximity, and published analyses of the determinants of grandchild care have therefore controlled for it. How far away from one's grandchildren one resides, however, depends on choices, and may therefore be a reflection of familial attachment or alienation rather than simply an exogenous causal determinant of care (Seltzer, Yahirun, & Bianchi, 2013). To address this complication, the multivariate analyses presented here were conducted both with and without controlling for residential proximity, and in the process, we tested three further hypotheses:

(5) Grandparents, especially grandmothers, will reside nearer to their adult birth children than to their adult stepchildren.
(6) This tendency to reside nearer to birth children will be stronger among grandmothers than among grandfathers.
(7) Because residing nearer to one's birth children is an aspect of the preference for them that is "controlled away" when proximity is treated as a distinct causal factor in multivariate analyses, discrimination against stepchildren will appear to be even stronger when proximity is removed from the list of control factors.

Prior research provides extensive evidence that grandparents and grandchildren have more frequent contact and profess greater emotional closeness if they are related by direct descent than if there is a step- link between them, although there is variability related to the specific type and duration of the relationships involved. Many studies speak to care and investment only indirectly (Chapman, Kang, Ganong, Sanner, & Coleman, 2018; Christenson & Smith, 2009; Gray & Brogdon, 2017; Pashos et al., 2016; Steinbach & Silverstein, 2020), but two that assessed differential care using data from a multi-national European survey, SHARE (see next section), have produced seemingly contrary results. An early analysis of the first wave of SHARE data by Coall, Hilbrand, and Hertwig (2014) led them to the surprising conclusion that European grandparents were more likely to provide at least occasional care for "nonbiological grandchildren" (the progeny of their step-, adoptive, and foster children) than for "biological grandchildren", net of various controls, although, as expected, the latter were more likely to receive frequent care. Tanskanen, Danielsbacka, and Rotkirch (2020), by contrast, found substantial Cinderella effects in an analysis of several waves of data, and faulted Coall et al. (2014) for having lumped adoptees together with stepchildren. Here, we analyze data from the same survey. Our tests of Hypotheses 1 and 2 support the conclusions of Tanskanen et al. (2020), and our tests of Hypotheses 3 through 7 extend them.

1.1. The Survey of Health, Aging and Retirement in Europe (SHARE)

SHARE was launched in 2004 in eleven European countries, plus Israel (Börsch-Supan et al., 2013). The Israeli data are excluded from this report. By 2019, seven waves had been completed at roughly two-year intervals. The survey's target population is persons over 50 years of age who speak an official language of the country in which they dwell and who do not reside "in an institution such as a prison", plus their partners. Whether persons residing in institutions for the elderly were included in the sampling frame varied among the participating countries (Klevmarken, Swensson, & Hesselius, 2005). Full information on the demography of SHARE participants can be found in the above two sources and other materials on SHARE's website.

One set of questions posed in Waves 1, 2, 4, 5 and 6 (but not Wave 3) dealt explicitly with grandchild care. In Waves 1 and 2, these questions were asked of all grandparents in contacted households, but with reference only to the first four children listed by one household member (the "family respondent"). In later waves, the same questions were asked only of that one family respondent, but now with reference to up to 20 children. Here, we analyze answers about child care assistance to the first four children named, in Waves 1, 2, 4, 5 and 6.

2. Methods

2.1. Inclusion criteria

The criteria for eligibility for this study were that the respondent (1) was a first-time interviewee, (2) was at least 50 years old, and (3) had at least one grandchild, under the age of 13 years, whose parent was both one of the first four children listed and either the "natural" offspring (SHARE's terminology) of the respondent or a stepchild (the "natural" offspring of a current or former partner). Criterion (1) was adopted because only initial interviews are consistent in the time period that respondents were instructed to recall: whereas first-time participants were asked about care of their grandchildren "during the last twelve months", subsequent interviews instead asked about care "during the time since the last interview", a highly variable period ranging from about two years to more than a decade.

The resultant data set includes 20,925 women with 30,520 adult children who themselves had children, and 15,846 men with 23,206 such children. These 53,726 adult children (rather than the grandchildren themselves) are the basic units of analysis, both because SHARE does not ask which particular grandchildren were actually cared for, and because our hypotheses concern which members of the middle generation were recipients of this child-care service. Furthermore, the year of birth was recorded only for the youngest grandchild of each of the respondent's children, and eligibility criterion (3) was adopted to restrict the cases to those grandchild "broods" (henceforth called "sib sets") in which at least one was a minor still in need of supervision. The data include respondents from 20 countries (Austria, Belgium, Croatia, Czechia, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland), with country-specific Ns ranging from 713 (Luxembourg) to 4844 (Belgium).

2.2. Dependent variables: Grandchild care

SHARE interviewees who affirmed that they had grandchildren were asked whether they had "regularly or occasionally looked after your grandchild(ren) without the presence of the parents". Those who answered "yes" were asked for which of their children they had provided this service, and for each child named, "On average, how often did you look after the child(ren) of [child name] in the last twelve months? Was

it... (1) almost daily, (2) almost every week, (3) almost every month, or (4) less often?"

Like several prior SHARE analysts, we constructed two binary dependent variables for analysis: (1) "Did the respondent *ever care* for a particular sib set?" within the preceding year; and (2) "Did he or she provide *frequent care*?", which we define as "almost every week" or more often. These two measures are necessarily highly correlated, but they warrant separate scrutiny because prior research using the SHARE data has shown that they respond differently, and sometimes even in opposite directions, to certain independent variables. In addition to Coall et al.'s conclusion that "non-biological" grandchildren scored higher than "biological" grandchildren on Ever Care whereas the reverse was true for Frequent Care, Hank and Buber (2009) have reported that northern Europeans surpassed southern Europeans in rates of Ever Care but this contrast was reversed for Frequent Care, and Žilínčíkova and Kreidl (2018) have reported that divorce and national differences in divorce rates have different effects on the two measures. Hank and Buber (2009) suggest that Ever Care and Frequent Care reflect distinct sorts of social arrangements, and only the latter represents a substantial grandparental investment.

2.3. Independent variables

Parent/child relationship status. SHARE asks the family respondent to list the children of both one's self and one's partner, including stepchildren, adoptees, and foster children, and then whether all those named are the "natural children" of the respondent and his or her partner. If they are not, the particular relationships are interrogated, child by child. For present purposes, childcare assistance to adoptive and foster children is excluded from analysis, which removes 0.7% of otherwise eligible sib sets. The remaining children (members of the middle generation) were categorized, in the case of respondents with partners, as (1) a child of both parents, (2) a child of the respondent and stepchild of the partner, or (3) a stepchild of the respondent and child of the partner. For respondents without partners, they were categorized simply as their (1) birth ("natural") children or (2) stepchildren.

Laterality. Children of a respondent's son were coded (1) and those of a daughter (2). This distinction is a major predictor of differential grandparental care, both in the SHARE data (Danielsbacka, Tanskanen, Jokela, & Rotkirch, 2011; Daly & Perry, 2019) and cross-culturally (review by Daly & Perry, 2017). Two distinct but complementary evolutionary explanations for this preference for uterine grandchildren is that it is an adaptive response to paternity uncertainty (Euler & Weitzel, 1996; Smith, 1991) and/or to the fact that investments in grandchildren alleviate demands on their mother, thus allowing her to make other contributions to her inclusive fitness and that the grandparent's own inclusive fitness thus profits from helping a daughter more than from helping a daughter-in-law (Perry & Daly, 2017).

Proximity. Respondents were asked whether each of their children dwelt (1) 'in the same household'; (2) 'in the same building'; (3) 'less than 1 km away'; (4) 'between 1 and 5 km away'; (5) 'between 5 and 25 km away'; (6) 'between 25 and 100 km away'; (7) 'between 100 and 500 km away'; (8) 'more than 500 km away'; or (9) 'more than 500 km away in another country'. We collapsed options (8) and (9) into a single category, and reverse-coded the resultant 8-point scale so that higher values indicate closer proximity.

Age. A grandparent's age in years at the time of interview was coded as an integer.

Health status. Respondents' health was assayed by a single self-report item: 'Would you say your health is (1) very good, (2) good, (3) fair, (4) bad, or (5) very bad?', which was reverse-coded to make good health the positive end of the scale. This item has good validity as a predictor of mortality, even when other health indices are controlled (Idler & Benyamini, 1997), and has been shown to be a valid indicator of physical and mental health in 19 European countries, including 15 of the 20 contributing data here (Baćak & Ólafsdóttir, 2017).

Financial status. SHARE asks many detailed questions about income and assets from which multiple estimates of respondents' total household income and net worth are derived. We used the first estimate of each, then divided total household income by the square root of the number of household members to adjust for lower *per capita* costs in larger households (see, *e.g.*, Atkinson, Rainwater, & Smeeding, 1995), and converted this measure and household net worth, both of which are highly skewed, to wave-specific quintiles. A third measure of financial distress was provided by this item: "Thinking of your household's total monthly income, would you say that your household is able to make ends meet (1) with great difficulty, (2) with some difficulty, (3) fairly easily, or (4) easily?"

The bivariate correlations among these three measures ranged from 0.4 to 0.5, so to reduce collinearity among our controls, we summed them to produce a single Financial Status scale with Cronbach's $\alpha = 0.69$. Because this is a novel measure, we assessed its robustness by comparing the results of regression models using it as a predictor with those obtained when it was replaced by each of its constituent measures, or by all three; results of these robustness checks are briefly described in Results and presented in full in the Supplementary Information (SI), Table S3.

Number of grandchild sib sets. Because respondents must allocate finite time and effort, we include the number of their children who themselves had children as a control predictor of care. For this purpose, we do not restrict the potential "competitors" for grandparental attention to grandchildren under the age of 13 years.

2.4. Analytical methods

The effects of relationship status and other variables on grandparental care were assessed by logistic regression, using Stata 13.1. Contrasts are presented as Odds Ratios. "Predicted" probabilities of care are derived from logistic regressions incorporating interaction terms, using Stata's "margins" command. All reported p values are two-tailed. The code used to generate and analyze the data set is available, on request, from the corresponding author.

The unit of analysis is the grandchild sib set, for reasons noted earlier. The 53,726 eligible sib sets represent an average of 1.46 per eligible respondent. Following the recommendations of Clarke (2008) and McNeish (2014), who have shown that clustered regression techniques with many small clusters inflate group-level variance estimates, all reported regressions were conducted without clustering. As a robustness check, however, we repeated all analyses with cases clustered within individual respondents, using Stata's "robust cluster" procedure; in no case did the results differ substantially or with respect to statistical significance from those reported.

3. Results

3.1. Differential childcare assistance to birth children versus stepchildren

Hypothesis 1 was that the progeny of stepchildren would be cared for less than those of birth ("own") children. This hypothesis was strongly supported. Grandmothers reported providing grandchild care ("ever care") for 55.4% of their birth children with minor children *versus* 27.3% of their stepchildren; for grandfathers, reported rates of care were 45.8% for birth children and 38.5% for stepchildren. The discrimination was larger with respect to "frequent care", which grandmothers provided for 29.2% of birth children but only 6.6% of stepchildren, and grandfathers provided for 22.0% of the former and 10.6% of the latter. Respondent numbers are sufficiently large that all of these birth child / stepchild contrasts, including the seemingly small difference in ever care by grandfathers, are statistically significant at $p < .0001$ by χ^2 test.

Table 1 presents the results of multivariate analyses of the responses of interviewees who had current partners, controlling for several other factors that had their own significant effects on grandchild care. The fact

Table 1
Results of logistic regressions assessing differential care of grandchildren who were the progeny of stepchildren *versus* birth children, among respondents living with partners. The Odds Ratios for "Stepchild, partner's child" and "Own child, partner's stepchild" are relative to care by grandparents still residing with the other grandparent.

	Ever care in past year?		Frequent care (weekly or more)	
	Grandmothers	Grandfathers	Grandmothers	Grandfathers
Reference: child of both partners				
Stepchild, partner's child	0.23***	0.60***	0.18***	0.40***
Own child, partner's stepchild	0.83***	0.40***	0.58***	0.27***
Proximity (8-point scale)	1.36***	1.31***	1.81***	1.73***
Daughter's child (reference: son's)	1.50***	1.42***	1.57***	1.56***
Age (years)	0.96***	0.97***	0.96***	0.97***
Health (5-point scale)	1.14***	1.12***	1.12***	1.08***
N of grandchild sib sets	0.93***	1.02*	0.90***	0.95**
Full time employment	0.91**	0.78***	0.66***	0.56**
Financial status (14-point scale)	1.14***	1.15***	1.07***	1.08***
N of cases	21,447	20,326	21,447	20,326
Nagelkerke pseudo-R^2	0.164	0.135	0.255	0.216
AIC/N	1.240	1.278	1.020	0.924

* $p < .05$; ** $p < .01$; *** $p < .001$.

that all Odds Ratios for "stepchild, partner's child" are substantially lower than 1.0 again supports Hypothesis 1. Hypothesis 2 was that this discrimination would be greater among grandmothers than grandfathers, and this, too, is upheld by the results in Table 1 (as well as by the raw frequencies presented above). Likelihood ratio tests of the interaction between grandparent sex and the step-*versus*-birth child variable in additional regressions (not shown) confirm the significance of this contrast (ever care: LR $\chi^2_{1df} = 65.7$, $p < .0001$; frequent care: LR $\chi^2_{1df} = 17.9$, $p < .0001$).

Both sexes also reported significantly reduced care of their birth children's children when the current partner was a stepparent ("Own child, partner's stepchild"), and here, the effect was much bigger in grandfathers than in grandmothers. Fig. 1 makes these effects vivid. Among grandmothers, the drop in care associated with having a partner who is a stepparent was relatively small, and the drop when she was herself a stepparent is large; among grandfathers, the reverse is true, and the progeny of birth children by former partners were actually less likely to be cared for than those of stepchildren, supporting Hypothesis 3.

Table 2 and Fig. 2 present the multivariate results for respondents without partners. As expected, single grandmothers provided little care for their stepgrandchildren, but the situation is less clear for single grandfathers, whose (low) rates of caring did not differ significantly between their own children's progeny and those of their stepchildren.

Hypothesis 4, that the magnitude of the Cinderella effect would be elevated among single grandparents, was not supported. The stepchild: birth child Odds Ratios in Table 2*versus*Table 1 are in the predicted direction for grandmothers, but not for grandfathers, and in no case did a likelihood ratio test indicate a significant [partnership status] × [step-*versus*-birth child] interaction. There is reason to question, however, whether stepchildren may have been selectively omitted from the children listed by single grandparents. Of the potential recipients of care by partnered grandmothers, 3.91% were the progeny of stepchildren, but for both widowed and divorced grandmothers, they comprised only 0.52%. For grandfathers, stepchildren constituted 4.80% of the children of men with current partners, but only 2.65% of those listed by widowers without partners and 1.79% for those who were divorced. Reasons for suspecting that these contrasts are indicative of selective "forgetting" are considered in the Discussion section, but if this is indeed so, then the

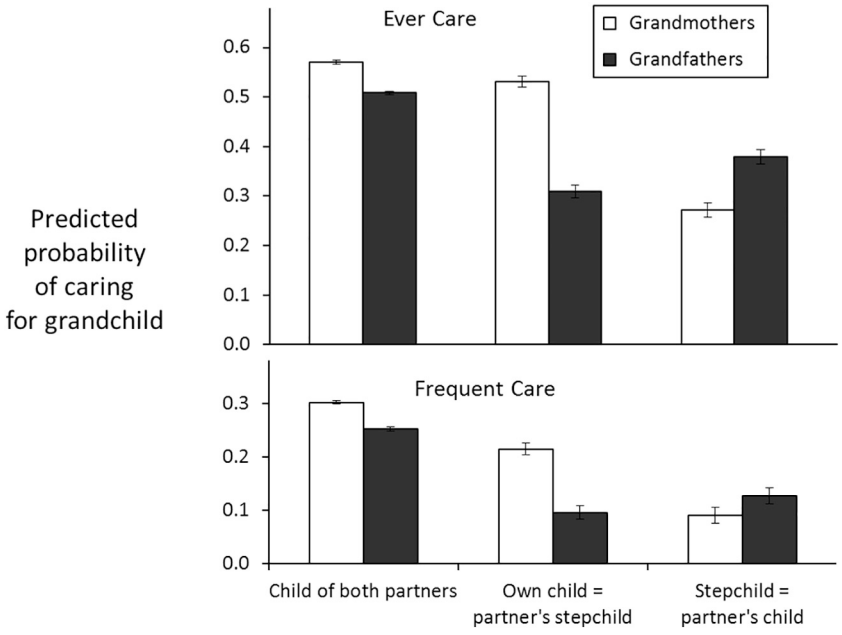

Fig. 1. Predicted probabilities (± standard errors) that respondents with partners cared for grandchildren who were the progeny either of the respondent and his or her current partner, or of only one member of the couple, based on logistic regressions incorporating all the predictors in Table 1.

Table 2
Results of logistic regressions assessing differential care of grandchildren who were the progeny of stepchildren *versus* birth children, among respondents without current partners.

	Ever care in past year?		Frequent care (weekly or more)	
	Grandmothers	Grandfathers	Grandmothers	Grandfathers
Stepchild (reference: birth child)	0.10***	1.06	0.08***	0.41
Proximity (8-point scale)	1.36***	1.45***	1.75***	1.89***
Daughter's child (reference: son's)	1.58***	1.53***	1.66***	2.19***
Age (years)	0.96***	0.98***	0.97***	0.99
Health (5-point scale)	1.25***	1.02	1.23***	1.01
N of grandchild sib sets	0.72***	0.87*	0.70***	0.85*
Full time employment	1.01	0.78*	0.66***	0.49***
Financial status (14-point scale)	1.13***	1.16***	1.07***	1.10***
N cases	8881	2728	8881	2728
Nagelkerke pseudo-R^2	0.210	0.145	0.255	0.224
AIC / N	1.217	1.104	0.952	0.581

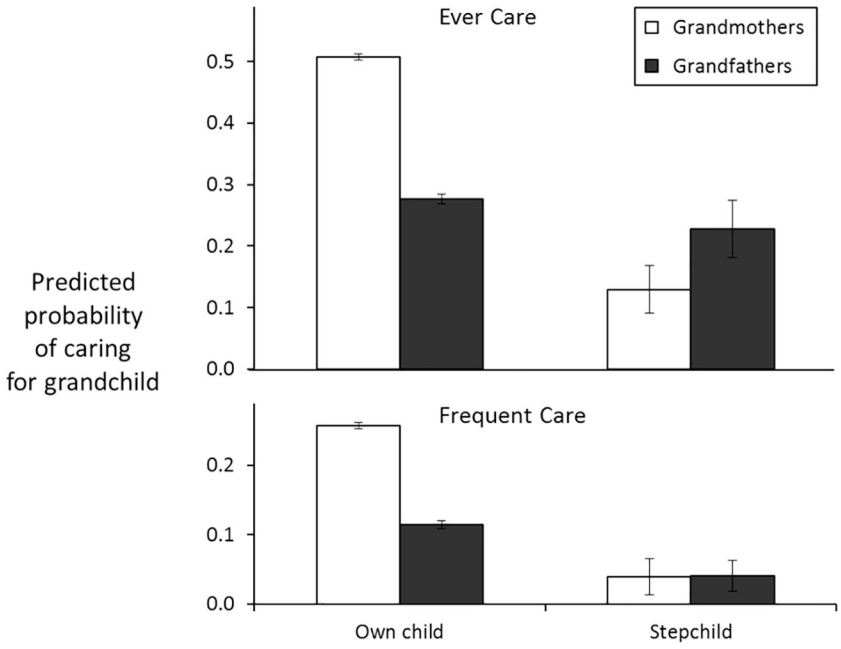

Fig. 2. Predicted probabilities (±standard errors) that respondents without partners cared for grandchildren who were the progeny either of the respondent's own (birth) child or of a stepchild, based on logistic regressions incorporating all the predictors in Table 2.

extent to which single grandparents, especially grandmothers, discriminated in favour of their birth children and against stepchildren is more extreme than the results in Table 2 and Fig. 2 indicate, and Hypothesis 4 awaits a better test.

3.2. *Proximity, steprelationship, and grandchild care*

Hypothesis 5, that grandparents would live nearer to their adult birth children than to their adult stepchildren, was confirmed. For grandmothers, 24.3% of adult birth children with minor children of their own lived less than 5 km away, compared to just 6.2% of stepchildren; for grandfathers, the corresponding numbers are 22.7% and 11.8%. At the other extreme, 30.6% of adult stepchildren with minor children lived more than 100 km away from interviewed grandmothers, compared to 17.5% of birth children; for grandfathers, the corresponding numbers are 22.2% for stepchildren and 18.4% for birth children. Testing across the full range of residential proximity, the stepchild *versus* birth child contrast was significant at $p < .001$ by Kruskal-Wallis signed-rank test for each of the four grandchild sex x grandparent sex combinations. The full distributions of respondent-child proximity are presented as Table S1 in SI, along with test details.

Hypothesis 6 was also supported. As the numbers in the preceding paragraph illustrate, contrasts in residential proximity between stepchildren and birth children were larger in grandmothers than in grandfathers. Analysis of variance confirms the contrast: sex of respondent ($F_{1,3\ df} = 14.9$), birth child *versus* stepchild ($F_{1,3\ df} = 282.1$), and the interaction between the two ($F_{1,3\ df} = 33.2$) were all highly significant ($p < .0001$) predictors of residential proximity.

Finally, Hypothesis 7 was also upheld. The results of eight additional logistic regressions, identical to those presented in Tables 1 and 2 except for the exclusion of proximity, were compared to their counterparts in those tables. Table 3 summarizes the main findings with respect to frequent care: omitting proximity had the effect of substantially reducing model fit (the Nagelkerke pseudo-R^2 value) but all other predictors retained their significant effects, and the relevant Odds Ratios indicated that the deficit in childcare assistance associated with steprelationship was greater than was the case when proximity was controlled. Results for "ever care" were qualitatively similar. Results of these analyses are presented in full as Tables S2a to S2d in SI.

Table 3
Results of logistic regressions assessing differential rates of providing frequent childcare assistance for stepchildren *versus* birth children, among respondents without current partners.

	With proximity in the model		Proximity not in the model	
	Step:Birth Odds Ratio	pseudo-R^2	Step:Birth Odds Ratio	pseudo-R^2
Grandmothers with partners	0.18***	0.255	0.13***	0.061
Grandmothers with no partner	0.08***	0.255	0.05***	0.068
Grandfathers with partners	0.40***	0.216	0.33***	0.054
Grandfathers with no partner	0.41	0.224	0.35	0.037

3.3. Alternative measures of financial status and distress

The novel "financial status" measure used as a control variable in our regressions is an amalgam of incommensurate (albeit correlated) measures of income, wealth, and subjective financial distress, and might be criticized as arbitrary in its construction. We therefore conducted a set of robustness checks, replacing it with each of its component measures as well as all three. The results for all other variables were virtually identical with respect to Odds Ratios and significance levels, but model fit statistics were best when the new compound measure was used. Details of these further analyses are included as Table S3 in SI.

4. Discussion

In this study, both women and men reported higher rates of providing childcare assistance to their birth children than to their stepchildren. These "Cinderella effects" were substantially larger among grandmothers than among grandfathers, and were especially strong with respect to frequent (at least weekly) caregiving. They were also enhanced, rather than diminished, by the removal of residential proximity from the list of control variables, as one would expect if proximity is not simply an exogenous determinant of closeness and support but reflects choices made in the shadow of these relationship qualities.

Tanskanen et al. (2020) also found a large Cinderella effect in the SHARE data, but they treated care as a single 5-level ordinal variable, rather than reporting results for "ever care" and "frequent care". We adopted the latter strategy largely because Coall et al. (2014) had reported that "nonbiological" grandparents had a significantly *higher* incidence of "ever care" than "biological grandparents" when various other factors were controlled, including those in our multivariate analyses. Our results (Tables 1 and 2) contradict this conclusion. The difference in outcomes is not due to the fact that the Coall et al. study used only Wave 1 data; results are essentially identical to those in Tables 1 and 2 if analysis is confined to Wave 1. Neither is the difference due simply to the fact that "nonbiological" children included adoptive and foster children as well as stepchildren; adoptees and foster children constituted only 15% of the "nonbiological" category, and whereas the children of adoptees were cared for at rates similar to birth children, the children of foster children were not. The crucial difference apparently resides in two novel compound variables that Coall et al. introduced as controls: "filial expectations", which they constructed from four attitude questions about such matters as whether grandparents *should* provide childcare, and "conflicts with children", which specifically concerned the respondents' conflicts with the children they listed. Including these as control variables apparently washed out elements of the attitudes and relationship qualities that mediate and "explain" differential rates of childcare assistance, and thus obscured the reality of stepchild disadvantage.

Six of our seven hypotheses were clearly supported, but Hypothesis 4 was not. Although the Cinderella effect was apparently elevated among grandmothers who no longer lived with their stepchild's father, as predicted, this contrast was not statistically significant, nor was there any such contrast in the grandfathers' data. If steppaternal investment is indeed undertaken as mating effort, it appears to be the case that it nevertheless often develops into enduring bonds.

There is reason to question, however, whether those stepchildren with whom no enduring bond had been formed may have been selectively omitted from the children listed by single grandparents. We suggest this because stepchildren comprised a substantially greater percentage of the potential recipients of childcare assistance listed by grandparents with current partners than was the case for either widowed or divorced grandparents, and there is no obvious reason why formerly married grandparents should have proportionately fewer stepchildren to such a degree. Indeed, because the presence of a stepchild is itself a major risk factor for divorce (Becker, Landes, & Michael, 1977; White & Booth, 1985), one might expect that elderly respondents whose marital status is "divorced" would have relatively large numbers of stepchildren compared to those who are currently married, especially since most of the latter have never divorced. And as regards widows, the substantially greater average age disparity of couples in remarriages (*e.g.*Gustafson & Fransson, 2015; Qian & Lichter, 2018) implies that remarriages, which are more likely than first marriages to create steprelationships e.g. Prskawetz, Vikat, Philipov & Engelhardt (2003), are also more likely than first marriages to leave one partner (usually the wife) widowed. Both for these reasons and because it is common for all contact with stepparents and stepgrandparents to cease in the event of the linking parent's death or, especially, after divorce (*e.g.*, Noël-Miller, 2013; Sanner et al., 2018), we suspect that single grandparents of both sexes systematically "forgot" children of former partners. If this conjecture is correct, then even the low estimates of childcare assistance to stepchildren by single parents in Table 2 and Fig. 2 are still too high. Further research is needed.

A further reason for cautious interpretation of these results resides in the specific SHARE questions. Interviewees were asked whether they had "regularly or occasionally looked after your grandchild(ren) without the presence of the parents" but they were not asked what specific childcare activities they had undertaken. Thus, when a child was left in the care of grandparents, both might answer the question in the affirmative even if only one minded the child, and it is noteworthy in this regard that the great majority of currently married men who claimed to have provided childcare services for one of their children had partners who said that they had done so, too, whereas the same was not true for grandmothers (Daly & Perry, 2017; Knudsen, 2012).

An additional complication is that SHARE interviews do not elicit the distance between a respondent's residence and that of her grandchildren, but only that between the respondent and her own child (the grandchild's parent), which thus had to serve as our proxy measure of respondent-grandchild proximity. Since analyses are restricted to children under age 13, using this proxy is unlikely to have produced error due to a grandchild's having become independent, but unknown numbers of grandchildren will have been in the custody either of the grandparents themselves or of an estranged partner of the respondent's child, in which case the distance to the respondent's child's residence will have misrepresented the distance to the grandchild's residence.

Finally, SHARE distinguishes among the "natural", step, adoptive, and foster children of respondents, but no such distinctions are drawn for the next generation. Thus, the "grandchildren" for whom caregiving is analyzed include unknown numbers who were not the respondent's lineal descendants, but were adoptive, foster, or stepchildren of the respondent's birth children instead. This would be problematic if our aim were to analyze differential care as a function of grandparent/grandchild relatedness, but it is less of a concern (albeit a likely source of noise in the data) for the present paper in which the focus is on differential childcare assistance to birth children *versus* stepchildren. Other limitations of the SHARE data set are discussed by Daly and Perry (2019).

5. Conclusions

European grandparents, especially grandmothers, provide childcare assistance to their stepchildren at substantially lower rates than to their birth children. This is true with respect to both occasional and frequent childcare. Differences in discriminative childcare assistance by grandmothers *versus* grandfathers were striking, with women preferring their birth children more or less regardless of whether the current partner was the sire, whereas men mostly helped their current partners' children, as one would expect if childcare by men is more a matter of "mating effort" than parental investment. Whether these differences are equally true of hands-on childcare and child-minding is a question for future research. These are potentially important issues, in light of both changing rates of divorce, remarriage, and steprelationship, and evidence that grandparents' involvement with their grandchildren can be beneficial to all three generations (Coall & Hertwig, 2010; Sear & Mace, 2008; Tanskanen & Danielsbacka, 2018).

Funding

No financial support was received for this study, which uses data from SHARE Waves 1, 2, 4, 5 and 6 (dois: https://doi.org/10.6103/SHARE.w1.610, https://doi.org/10.6103/SHARE.w2.610, https://doi.org/10.6103/SHARE.w4.610, https://doi.org/10.6103/SHARE.w5.610, https://doi.org/10.6103/SHARE.w6.610). SHARE data are available to "the entire research community" (see http://www.share-project.org/). See Klevmarken et al. (2016) for further details about the survey methodology. SHARE has been funded primarily by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812) and FP7 (SHARE-PREP: N°211909, SHARE-LEAP: N°227822, SHARE M4: N°261982), with additional support from the German Ministry of Education & Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C), and various national funding sources.

Acknowledgements

We thank Mirkka Danielsbacka and Antti Tanskanen for advice about manipulating SHARE data files, and Mirkka, Antti, David Coall, and Ralph Hertwig for discussion.

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