Descriptive Finding

Who becomes a grandparent – and when?
Educational differences in the chances and
timing of grandparenthood

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Contents

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Abstract

BACKGROUND
Despite recent advances, the demographic understanding of grandparenthood remains limited.

OBJECTIVE
Our study examines educational differences in the transition to grandparenthood. Comparing East and West Germany, we analyze educational differences in a) the chance of becoming a grandparent, and b) the timing of grandparenthood for both men and women.

METHODS
We used fertility data across three family generations (German Ageing Survey, $N = 2,434$ men and women born 1933–1948) and methods of survival time analysis to study educational gradients in the transition to grandparenthood.

RESULTS
We found a strong educational gradient in the chances of grandparenthood among West German women: Lower-educated women's chances of becoming a grandmother were similar to higher-educated women's chances of becoming a mother.

CONCLUSIONS
Our findings have implications for research on multi-generational social mobility and on the consequences of grandparenthood.

CONTRIBUTION
Our study is the first to analyze how the transition to grandparenthood is socially stratified.

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1. Introduction

Grandparent research usually takes grandparenthood as an exogenous factor – a phenomenon that is taken as given rather than as a process to be explored. This is reflected in common strategies of sample selection. Analysts restrict their studies to three-generational structures, selecting grandparents, their children, or their grandchildren as the starting point of the analysis (e.g., Chan and Boliver 2013; Chiang and Park 2015; Hank and Buber 2009; Modin, Eriksson, and Vågerö 2012; Musil et al. 2011). As a result, the demographic understanding of transitions to grandparenthood remains limited.

A notable gap in the knowledge concerns socioeconomic differences in grandparenthood. Educational gradients in fertility (Kravdal and Rindfuss 2008) suggest that the experience of grandparenthood is stratified both in occurrence and timing. Differences may be particularly large in transitions to grandparenthood because they emerge as the combined outcome of fertility in successive family generations. Extant evidence on education and fertility suggests not only that higher-educated people become grandparents later in life, but also that they are less likely to experience the transition at all.

The present study explores the demographic linkages between education and the transition to grandparenthood. Understanding these linkages is relevant to different strands of current grandparent research, given that the chance of becoming a grandparent and the timing of this transition are important factors in determining the meaning, performance, and consequences of the grandparent role.

The German context presents an interesting setting in which to study educational differences in the transition to grandparenthood because the legacy of the East-West divide still offers sharp contrasts in various important aspects, including the timing and level of fertility, kinship structure, career trajectories, and gender differences.

2. Data and methods

Our analysis is based on data from the third wave of the German Ageing Survey (DEAS), a large-scale survey representative of older adults aged 40 to 85 living in private households in Germany (Engstler and Motel-Klingebiel 2010). In the third wave of the DEAS, comprehensive retrospective information about fertility and grandparenthood was collected. We restricted our analysis to data from the cross-sectional sample of 6,205 first-time respondents recruited in 2008.

Our sample restrictions were largely modeled after those applied by Leopold and Skopek (2015a), selecting individuals aged 60 to 75 at the time of interview who had

lived in East or West Germany before reunification (birth cohorts 1933 to 1948; $N = 2,434$). An important difference is that we focused not only on parents in our analysis (i.e., those 'at risk' of grandparenthood) but also on childless persons.

The DEAS provides data on highest educational attainment coded according to the ISCED scheme. Because more differentiated educational categories means fewer cases in each, we dichotomized educational level into higher (tertiary level, ISCED 5–6) versus lower (non-tertiary, ISCED 1–4). This distinction captures meaningful differences for the purpose of our study: Higher education is strongly associated with the timing of childbearing, as parenthood is typically postponed until finishing education. This applied in both socialist East Germany and in West Germany, although family formation and education were more compatible in the East than in the West (Kreyenfeld 2004).

Table 1 provides a descriptive overview of our sample according to the different indicators of fertility. Data is shown separately by region of Germany (East or West), gender, and educational level (lower or higher). For the cohorts under study we observed higher levels of tertiary education for East Germans (about 10 percentage points higher for both men and women). Childlessness was more prevalent in West Germany, especially among higher-educated women: Almost 28% of higher-educated women were childless at the interview date, compared to about 13% of women with nontertiary education. However, conditioning on parenthood, we observed no East/West differences in the average number of children.

We examined the chance of becoming a grandparent using Kaplan-Meier estimates for the probability of being a grandparent at different ages separately for men and women from East and West Germany. For the analysis of the timing of grandparenthood we focused on a subsample of parents 'at risk' of experiencing grandparenthood ($N = 2,120$). We assessed the typical timing of grandparenthood by estimating the median age at the first transition to grandparenthood. The main interest was in how occurrence and timing of grandparenthood differed by educational level. For ease of interpretation we included analogous results for the timing of first-time parenthood along with those for the timing of grandparenthood.

Table 1: **Descriptive statistics on the total sample, parents, and grandparents by part of Germany, gender, and educational level**

Sample	West				East			
	Women		Men		Women		Men	
	Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher
Total (N=2,434)								
Year of birth	1940.2	1941.8	1939.3	1940.2	1939.8	1941.4	1939.4	1940.0
	(4.4)	(4.5)	(4.3)	(4.3)	(4.3)	(4.3)	(4.4)	(4.1)
Childless (%)	12.4	27.9	13.3	14.0	7.9	9.1	14.5	9.1
Grandparent (%)	70.5	42.9	66.7	56.1	78.9	74.4	72.3	76.4
N	596	140	528	314	280	121	235	220
Parents (N=2,120)								
Average number of children	2.2	2.1	2.2	2.1	2.2	2.0	2.2	2.1
	(1.2)	(0.9)	(1.1)	(0.9)	(1.2)	(0.9)	(1.1)	(1.1)
Average age at first birth	24.2	28.4	27.1	28.6	23.0	23.9	25.2	26.3
	(4.1)	(5.1)	(5.0)	(5.6)	(3.9)	(3.3)	(4.7)	(4.6)
Grandparent (%)	80.5	59.4	76.9	65.2	85.7	81.8	84.6	84.0
N	522	101	458	270	258	110	201	200
Grandparents (N=1,657)								
Average number of grandchildren	3.4	2.8	3.2	3.2	3.6	2.9	3.1	3.0
	(2.5)	(1.9)	(2.3)	(2.1)	(2.5)	(1.8)	(1.9)	(1.8)
N	420	60	352	176	221	90	170	168

Notes: Men and women born between 1933 and 1948. Parents and grandparents are subsamples of the total sample. Standard deviation in parentheses. Lower = educational level less than ISCED 5 (non tertiary). Higher = educational level ISCED 5 or 6 (tertiary).
Source: DEAS (German Ageing Survey 2008).

3. Results

3.1 Education and the chance of grandparenthood

Kaplan–Meier estimates for the fraction of parents and grandparents at different ages are presented in Figure 1. Table 2 (men) and Table 3 (women) show estimates at different ages including statistical tests and odds ratios.

A strong educational gradient in the chance of being a grandparent emerged among West German women: Among lower-educated women, approximately three in four (74%) had become a grandmother by the age of 70. Among higher-educated women in the same cohorts, only one in two (48%) had experienced this transition by the age of 70. The shape of the probability curve (Figure 1) indicates that the latter share is unlikely to rise far above the 50% mark, suggesting that half of higher-educated women

in our study cohorts in West Germany never become grandmothers. More detailed analysis of grandmotherhood at different ages shows that educational gaps in West Germany were largest at younger ages, decreased thereafter, but remained large even towards the end of the process.

Figure 1: **Probability of parenthood and grandparenthood by gender, region of Germany, and education. Cumulated probability functions obtained by Kaplan–Meier estimation**
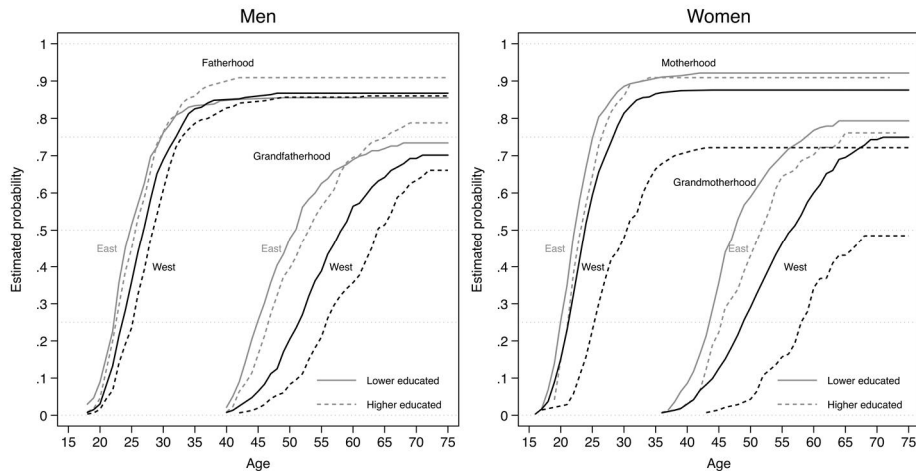
The plots for parenthood show that part of this gap in grandmotherhood is due to educational differences in parenthood, particularly in terms of childlessness. However, even when conditioning the sample on mothers, differences in the chances of becoming a grandmother in West Germany remained substantial: About 84% of lower-educated mothers were grandmothers at age 70, compared to only 68% of higher-educated mothers (results not shown). These findings support the expectation that the educational gradients in fertility are magnified in processes of grandparenthood.

Table 2: **Men's cumulative probability of being a father and grandfather at different ages by region of Germany and educational level**

At age	East Fathers Lower	Higher	OR	Grandfathers Lower	Higher	OR	West Fathers Lower	Higher	OR	Grandfathers Lower	Higher	OR
20	9	5	2.06[T]		–		3	2	1.93		–	
25	51	45	1.30		–		36	24	1.82*		–	
30	76	76	0.99		–		69	61	1.43*		–	
35	83	86	0.82		–		83	79	1.29		–	
40	85	90	0.61[T]	2	1	2.37	85	83	1.16	1	0	2.39
45	85	91	0.57[T]	26	16	1.75*	86	84	1.16	6	2	3.53*
50	86	91	0.59[T]	48	40	1.39[T]	87	86	1.09	20	8	2.85*
55	86	91	0.59[T]	63	56	1.29	87	86	1.09	39	21	2.38*
60	86	91	0.59[T]	69	70	0.97	87	86	1.09	56	36	2.34*
65	86	91	0.59[T]	72	75	0.86	87	86	1.06	64	51	1.69*
70	86	91	0.59[T]	73	79	0.74	87	86	1.06	69	63	1.30
χ^2		0.04			0.14			4.73*			17.26*	

Notes: Estimated probabilities expressed in percentages. Values obtained by Kaplan–Meier estimation. OR = odds ratio – factor by which odds of grandparenthood (grandparents/nongrandparents) of lower-educated differ from those of higher-educated; local statistical test of proportions based on standard errors obtained from Greenwood's approximation. χ^2 of a global statistical test of equality of survivor functions (log-rank test). Lower = educational level less than ISCED 5 (non tertiary); Higher = educational level ISCED 5 or 6 (tertiary).
[T] p <.10, * p < .05.

Table 3: **Women's cumulative probability of being a mother and grandmother at different ages by region of Germany and educational level**

At age	East Mothers Lower	Higher	OR	Grandmothers Lower	Higher	OR	West Mothers Lower	Higher	OR	Grandmothers Lower	Higher	OR
20	25	15	1.94*	–			15	1	12.27*	–		
25	75	64	1.62*	–			59	23	4.94*	–		
30	89	86	1.27	–			81	48	4.76*	–		
35	91	91	0.98	–			87	66	3.26*	–		
40	91	91	1.07	9	3	2.74*	87	70	2.98*	3	0	*n.e.*
45	92	91	1.17	36	22	1.93*	88	72	2.72*	13	1	9.93*
50	92	91	1.17	59	43	1.90*	88	72	2.72*	29	4	9.13*
55	92	91	1.17	70	64	1.29	88	72	2.72*	46	16	4.63*
60	92	91	1.17	77	70	1.40	88	72	2.72*	60	34	2.88*
65	92	91	1.17	79	76	1.21	88	72	2.72*	70	43	3.02*
70	92	91	1.17	79	76	1.21	88	72	2.72*	74	48	3.07*
χ^2		3.16[T]			4.14*			48.58*			38.34*	

Notes: Estimated probabilities expressed in percentages. Values obtained by Kaplan–Meier estimation. OR = odds ratio – factor by which odds of grandparenthood (grandparents/nongrandparents) of lower-educated differ from those of higher-educated; local statistical test of proportions based on standard errors obtained from Greenwood's approximation. *n.e.* = not estimable. χ^2 of a global statistical test of equality of survivor functions (log-rank test). Lower = educational level less than ISCED 5 (non tertiary); Higher = educational level ISCED 5 or 6 (tertiary).
[T] p <.10, * p < .05.

The findings for all remaining groups – East German women, East German men, and West German men – looked different. For West German men and East German women the curves of lower-educated and higher-educated individuals ultimately converged in each of these groups, indicating that differences in prevalence were only temporary, emerging from differential timing of fertility in successive generations.

An exception to these patterns is East German men. The chance of being a grandfather was initially higher in lower-educated men, but this difference reversed around the age of 60. As a result, the chance of being a grandfather at older ages was greater in higher-educated East German men, although the difference was not statistically significant. This reversal is a consequence of the inverted educational gradient in zero fertility observed for East German men, which makes the higher-educated less likely to remain childless (OR = 0.59, p<.10).

3.2 Education and the timing of grandparenthood

Figure 2 presents the point estimates and confidence intervals for median ages at (first-time) parenthood and grandparenthood. The results show the timing of grandparenthood is more strongly stratified by education than the timing of parenthood. Half of higher-educated West German mothers were grandmothers at age 61, compared to age 55 among lower-educated mothers. This six-year gap was double the gap found for age at motherhood. Similarly, the seven-year gap in median age at grandfatherhood among West German men was much larger than the two-year gap in age at fatherhood. In East Germany, educational gradients in the median age at grandparenthood were less pronounced and closer to the age gap in parenthood, particularly among men.

Figure 2: **Educational differences in median age at grandparenthood. Calculations of median ages and 95% confidence intervals based on Kaplan–Meier estimation for parents**
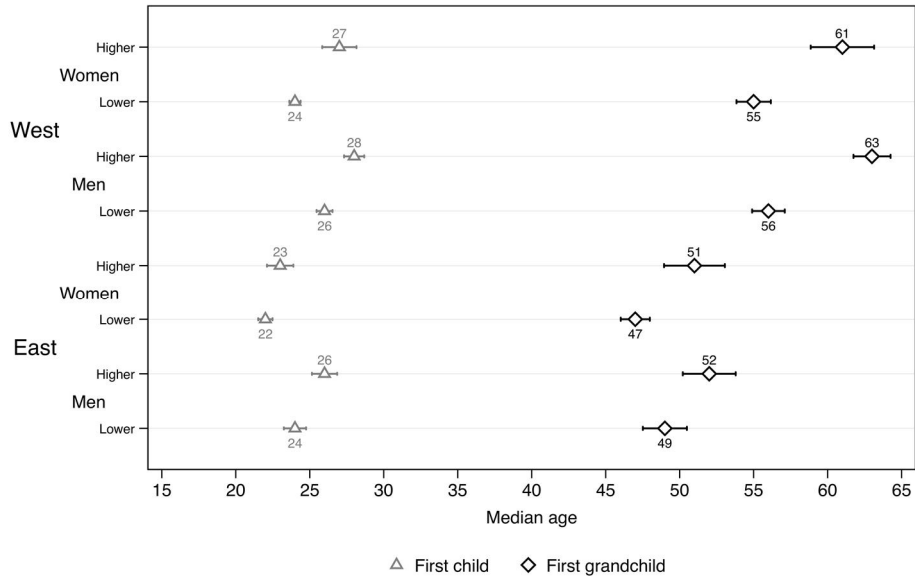
4. Discussion

This study is the first to examine educational differences in the demographic transition to grandparenthood, filling gaps in demographic knowledge about one of the major role transitions of older age. We used retrospective life-course data from the German Ageing Survey to reconstruct transitions to grandparenthood for men and women born between 1933 and 1948 in East and West Germany.

Our most prominent finding concerns West German women. In this group, only half of the higher-educated became grandmothers, compared to three-quarters of the lower-educated. Put into a larger life course context, this means that lower-educated women's chances of becoming a grandmother were about equal to higher-educated women's chances of becoming a mother. Additional analyses of transitions to parenthood show that these differences emerged primarily as a consequence of the high

level of childlessness among highly educated West German women in the birth cohorts under study.

By contrast, East German women displayed not only a lower level of childlessness but also no difference in childlessness by educational level, leading to a much smaller educational gap in grandparenthood at later ages. These findings reflect the fact that the link between women's educational participation, labor market attachment, and family formation was not as strong in the former socialist regime of the German Democratic Republic as in West Germany (Kreyenfeld 2004; Pascall and Manning 2000). We also found no educational differences in the chance of becoming a grandparent up to age 70 for East and West German men.

Educational differences were larger for the timing of grandparenthood than for the timing of parenthood, and larger in the West than in the East of Germany. In West Germany, differences between lower- and higher-educated people in the median age at grandparenthood amounted to six years among grandmothers and seven years among grandfathers, at least doubling the educational differences observed for the median age at parenthood. These findings illustrate how fertility delays are magnified in multigenerational processes of demographic reproduction. They also demonstrate how the legacy of historical differences between East and West Germany still shapes contemporary transitions to grandparenthood. In the former GDR, higher fertility levels over longer periods of time resulted not only in earlier parenthood and grandparenthood, but also in a weaker linkage between educational attainment and fertility.

We found no educational differences in the occurrence and timing of higher-parity transitions to further grandchildren (analyses not shown). The absence of notable differences beyond the initial transition to grandparenthood illustrates the selectivity associated with conditioning on grandparenthood. An important implication of this is that educational differences in the chances of grandparenthood are implicitly canceled out of the analysis if samples are reduced to three-generational structures – a common strategy in current grandparent research. For example, some analysts of 'grandparent effects' on social mobility have concluded that higher-educated grandparents improve their grandchildren's chances of school success above and beyond the contribution of parents (Modin, Erikson, and Vågerö 2012). However, this focus on social reproduction disregards educational differences in demographic reproduction.

In this regard, our findings on the chances of becoming a grandparent show that higher-educated women in West Germany were much less likely to have grandchildren to pass their cultural and economic capital on to. More generally, we recommend that studies on the social reproduction of attributes such as education also account for the demographic reproduction of individuals who carry those attributes, especially when looking at three-generational structures.

Our findings on the educational gradient in the experience of grandparenthood are also relevant to other areas of current grandparent research. For example, one provocative hypothesis to test empirically is whether grandparenthood is 'a blessing for the rich and a curse for the poor.' This hypothesis derives from the idea that among those in higher social positions, passages into the grandparent role are experienced later in life and in a possibly less demanding life-course context. These grandparents might reap the benefits of an enriching, affirming, and rewarding role in which they have a more active lifestyle yet are not overburdened, and their other activities are not interfered with. Among the disadvantaged, by contrast, grandparenthood at younger ages is more common. Earlier transitions, in turn, might induce stress and role overload, thus potentially entailing adverse effects on well-being, mental health, and physical health (Musil et al. 2011; Minkler and Fuller-Thomson 1999).

In this regard, empirical research has documented that younger grandparents are not only generally more likely to start and continue caregiving (Luo et al. 2012), but also that their support more frequently coincides with family crises and more often involves coresidence with the grandchild as well as highly demanding grandparent roles as primary or extensive secondary caregivers (Burton 1996; Goodman and Silverstein 2002). An example is the uneven distribution of teenage pregnancies across social positions (Miller and Benson 2001). These considerations suggest that not only the timing of grandparenthood but also the life course conditions surrounding the transition to grandparenthood are socially stratified, potentially inducing and exacerbating cumulative advantages and disadvantages in older age. Although some recent studies have demonstrated health benefits of caring for grandchildren (e.g., Condon, Luszcz, and McKee 2016; Ku et al. 2012), our findings on the stratified demographic experience of grandparenthood call for further research to study the potentially stratified consequences of grandparenthood. As we have only looked at educational differences in the typical age at grandparenthood, further research should also examine how these differences intersect with constraints and opportunities in other life domains to shape the meaning, performance, and consequences of the grandparent role. Finally, our findings illustrate the importance of the societal, demographic, and historical context in the study of fertility across multiple generations. Even within a unified Germany, differences between East and West are substantial, not only in the chance and timing of grandparenthood but also in the extent to which these aspects are stratified along educational lines. As these findings on educational differences in the transition to grandparenthood are limited to the German context, further research is needed to advance our demographic knowledge of grandparenthood in other countries. In light of the large international variation in the demographic profile of grandparenthood (Leopold and Skopek 2015b), future comparative research should examine the linkage between education and the demographic experience of grandparenthood in later life.

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