

# The Postponement of Grandmotherhood: A Cohort Comparison in East and West Germany

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## Abstract

This research explored the postponement of grandmotherhood in East and West Germany, investigating how timing and life-course context of this transition had changed across cohorts. We employed methods of survival analysis to estimate the timing of passages into the grandmother role as well as overlap with potentially competing roles of a worker in paid employment, a mother of coresident children, and a filial caregiver of elderly parents. Data from the German Aging Survey ( $N = 1,754$ ) revealed a rapid rise of approximately three months per year in the median age at grandmotherhood: From pre-war to post-war cohorts, this age increased from 47 to 53 in the East and from 55 to 60 in the West of Germany. As a result, the grandmother role decoupled almost entirely from active motherhood. Overlap with worker and filial roles, in contrast, occurred frequently and remained remarkably stable across cohorts. Our findings direct attention to a so-far neglected demographic trend that is striking in scope and unlikely to slow down in the near future.

## **Introduction**

This study investigated timing and context of transitions to grandmotherhood in East and West Germany. Our main purpose was to examine how typical entries into the grandmother role and the life-course conditions surrounding these transitions had changed from pre-war to post-war cohorts. In doing so, we aimed to close substantial gaps in knowledge about a demographic transition that is widely acknowledged to initiate one of the most salient social roles of the later life course.

Although grandmotherhood is a “countertransition” contingent on fertility in the younger generation, life course theorists agree that it represents a critical life event for middle-aged and older women (Sprey & Matthews, 1982; Hagestad & Burton, 1986). Indeed, involvement in the grandmother role is extensive, as grandmothers represent the single most reliable source of informal childcare for young parents (e.g., Fergusson et al., 2008; Hank & Buber, 2009). This involvement, however, can be costly for grandmothers because it frequently interferes with competing demands in other domains of life. The grandmother role, for instance, might coincide with the roles of a full time worker, a still-active parent of dependent children in the household, and a filial caregiver of elderly parents. Possible consequences are role overload, accumulation of daily stresses, and adverse effects on physical and mental health.

Scholarly interest in these themes dates back to the 1980s when analysts of the life course introduced their novel perspective to the study of grandparenthood (Hagestad & Burton, 1986; Sprey & Matthews, 1982) and called for research on “unexplored issues” (Hagestad & Lang, 1986) about timing and context of the grandmother role. Yet to this day, these issues remain largely unexplored. In fact, not a single study has adequately measured the timing of grandmotherhood, let alone assessed its typical life course context. Importantly, it is obvious that in many developed societies, these characteristics have changed substantially over time as a result of shifts in fertility, labor force participation, age at retirement, and life expectancy.

In view of that, the present study was designed to provide a demographic portrayal of contemporary grandmotherhood. Specifically, we addressed three main research questions about the timing and context of this transition: First, when do women typically experience the transition to grandmotherhood? Second, how is this transition sequenced with role involvements in other spheres of life? Third, how have timing and life course context of grandmotherhood changed across cohorts? To answer these questions, we adopted a comparative perspective, taking advantage of additional insights obtained from differences in political, economic, and demographic conditions that have distinctively shaped older women's life courses in East and West Germany.

We employed methods of survival analysis to estimate the timing of grandmotherhood. To characterize the life-course context of entry into the grandmother role, we focused on three other – potentially competing – involvements in the roles of (1) a worker in paid employment, (2) an active parent of coresident children, and (3) a filial caregiver of elderly parents. Our empirical analyses were based on data from 1,754 East and West German women who participated in the 2008 wave of the German Aging Survey. To capture change over time, we studied transitions to grandmotherhood separately for three cohorts of mothers born between 1929–38 (pre-war cohort), 1939–48 (war cohort), and 1949–58 (post-war cohort).

## **Demographic Trends in Grandmotherhood**

### *The Timing of Grandmotherhood*

When do mothers become grandmothers? This question has received much attention in the grandparent literature, particularly in studies discussing the potentially adverse effects of “off-time” grandmotherhood as compared to on-time transitions (Sprey & Matthews, 1982; Troll, 1985; Hagestad & Lang, 1986; Hagestad & Burton, 1986; Hagestad, 1988; Kivett, 1998; Landry-Meyer & Newman, 2004). These studies assumed that the birth of the first grandchild

“has been and will continue to be a change which typically occurs in midlife” (Hagestad, 1988, p. 407) and postulated age thresholds of, for instance, below 38 (“too early”) and over 60 (“too late”) to define off-time transitions (Burton, 1985).

Strong data about *actual* (i.e., empirical) age gradients of grandmotherhood were not available at that time. But even today, we lack accurate estimates for the timing of transitions into the grandmother role. One of the few approximations has been offered by Szinovacz (1998) who reported a mean age at grandmotherhood of 46, based on data from the second wave (1992–94) of the National Survey of Families and Households. This number, however, represented only those who had already experienced this transition before the interview date, disregarding information on non-occurrence contributed by women who were still “at risk” of becoming a grandmother at the time of the interview. If these (right-censored) observations are ignored, estimates are most likely biased downward (e.g. Singer & Willet, 2003).

Contemporary grandmotherhood in developed societies, thus, can be expected to occur at average ages considerably above the mid-40s. This is particularly true in the context of the present investigation, as Germany witnessed significant delays in age at first birth and substantial declines in total fertility rates. As a result, continuously late and low fertility has already affected two generations of German women. This suggests, in turn, that increases in age at grandmotherhood should have gained additional momentum in recent years – above and beyond concurrent delays in age at motherhood – as the timing of transitions into the grandmother role is influenced by fertility in *both* generations. For these reasons, Germany represents a particularly interesting demographic setting in which to study the changing nature of grandmotherhood across cohorts.

### *The Life-Course Context of Grandmotherhood*

A comprehensive understanding of grandmotherhood as a life course transition requires consideration of the context in which it is embedded, in particular the intersection of other, potentially competing, social roles (Kivett, 1998). If the typical age at grandmotherhood rises rapidly, the typical context in which the onset of the grandmother role is experienced will obviously be transformed as well. For the purposes of this study, we consider change in the life-course conditions surrounding grandmotherhood within three domains: employment, parenting, and filial caregiving. Each of these domains represents role involvements and associated time demands that might coincide, and potentially interfere, with performance of the grandmother role.

*Employment context.*— How often does grandmotherhood coincide with paid employment and how has overlap between these domains evolved across cohorts? An answer to this question requires consideration of three factors. First, educational expansion and the rise in female labor force participation (Blossfeld & Hofmeister, 2006): The obvious implication is a cross-cohort trend of increasing competition between the role of a grandmother providing care to grandchildren and time devoted to the role of a worker in paid employment. Second, the expected postponement of grandmotherhood: Among women who are or have been employed, this trend should involve a growing proportion of those in retirement upon entering the grandmother role. Third, increases in legal age at retirement: The effect of delays in grandmotherhood might be offset, at least to some extent, if age at retirement increases concurrently.

*Parenting context.*— Overlap between the roles of a grandmother and a still-active mother of dependent children is a recurrent topic in the literature, particularly in studies concerned with multigenerational households (Crumbley & Little, 1997; Fuller-Thomson & Minkler, 2000, 2001; Musil et al., 2011). The experience of grandchild care in a context of coresidence

with premature, presumably overstrained parents might constitute a potent stressor for grandmothers. It has been suggested already in the 1980s, however, that the roles of a parent and a grandparent have become more distinct and clearly sequenced across the life course, rendering such overlaps an increasingly rare occurrence in developed societies (Hagestad, 1988). This proposition derives from delays as well as declines in fertility, especially in the younger generation. Empirically, however, it has never been tested. Although the general tendency of decreasing overlap of mother and grandmother roles may appear obvious, level, scope, and pace of this trend remain unclear.

*Filial context.*— The primacy of daughters in parent care ranks among the most well-established findings in the literature on intergenerational relationships in aging families (Spitze & Logan, 1990). Another intensely studied topic is the associated caregiver burden as well as stress induced by conflicting demands in other roles (Brody, 1985; Stephens & Townsend, 1997; Stephens et al., 2001). Among these potentially conflicting involvements, the grandmother role has received scant attention. This gap is striking not only in view of the large literatures devoted to each caregiver role (i.e., daughters providing parent care and grandmothers providing childcare) but particularly when considering the fact that transitions into both roles presumably occur in close temporal proximity. Recent findings based on U.S. data, for instance, have shown that daughters who committed to parent care typically experienced this transition toward the end of their 40s (Leopold et al, 2013).

From the demographic vantage point of this study, the obvious questions in this regard concern (a) the chances of having surviving parents upon entering the grandmother role, (b) the typical sequencing of grandmotherhood and the death of parents, and (c) cross-cohort changes in these patterns. The steady rise in life expectancy, on the one hand, suggests increasing chances of having surviving parents upon grandmotherhood in developed countries such as Germany – a demographic trend consistent with the notion of a modern beanpole

family (Bengtson, 2001). On the other hand, this effect might be at least partially counterbalanced by a concurrent rise in age at grandmotherhood, particularly in recent cohorts. In this case of parallel postponements, the role of a grandmother providing childcare and a daughter providing parent care might continue to coincide closely across cohorts, albeit at more advanced ages.

### *Grandmotherhood in East and West Germany*

Germany is an instructive national context in which to study trends in the transition to grandmotherhood not only because past and current demographic shifts suggest marked change across cohorts but also because persisting differences between East and West Germany offer a comparative lens through which to view this transformation. With regard to our research focus, two differences stand out.

The first concerns past trends in fertility: In West Germany, delays and declines in fertility started already in the late 1960s, driven mainly by changes in women's resources as a result of increases in educational attainment and labor market productivity (Blossfeld & Huinink, 1991; Kreyenfeld, 2003, 2010). Furthermore, fertility decisions were taken in a context of low public childcare coverage and pervasive cultural norms sanctioning women who aimed to combine work and family. By the mid-70s, the total fertility rate (TFR) of West German women had dropped below 1.5. Although this decline leveled off in subsequent years, fertility has remained at very low levels ever since.

Fertility declines the East followed a more uneven pattern: A steep drop in the early 70s was followed by a brief period of resurgence during which the TFR almost returned to replacement levels in 1980 before declining again to the level of 1.5 before reunification. In the transformation period following reunification, the TFR in East Germany dropped almost in free fall to a level as low as 0.8 between 1992 and 1995 before rising again and

approaching West German levels in recent years (Goldstein & Kreyenfeld, 2011; Kreyenfeld, 2003).

With regard to the timing of grandmotherhood, these differences in fertility suggest, on the one hand, considerably earlier transitions in the East. This should apply especially to older cohorts of East German mothers whose children's fertility was still relatively early and high compared with those of West German mothers. On the other hand, age at grandmotherhood can be expected to rise most steeply for women born after the war in the early years of the Former GDR: Their children, born in the early and mid-70s, were those who had reached reproductive age precisely in the period after reunification that witnessed unprecedented drops in period fertility rates.

The second important East-West difference concerned the employment context of the grandmother role. Under the communist regime of the Former GDR, women's labor force participation was way above West German levels, suggesting considerably more frequent overlap between worker and grandmother roles. These differences should have declined across cohorts, however, as West German women's employment rates have surged from 52 to 59 percent in the period from 1989 until 2001 (Matysiak & Steinmetz, 2008). Subsequent changes experienced within a common policy regime of unified Germany, such as the recent increase in legal age at retirement, can be expected to affect the context of grandmotherhood equally in the East and West.

## **Data and Methods**

### *Data*

Our empirical analysis was based on data from the German Aging Survey, a large-scale survey representative of older adults living in private households in Germany (Engstler &



Motel-Klingebiel, 2010). These data were particularly suitable for our study purposes, as they included large samples of East and West German respondents who provided highly detailed information about their grandchildren as well as comprehensive retrospective information about their life courses. In the third wave of data collection, the German Aging Survey comprised a basic sample of 6,205 first-time respondents aged 40 to 85 recruited in 2008 as well as 994 panel respondents from two previous waves conducted in 1996 and 2002. We restricted our analysis to the basic sample surveyed in 2008 that is stratified by age, gender, and East and West Germany.

### *Assessing the Timing of Grandmotherhood*

In the third wave of 2008, the questionnaire included a comprehensive module about respondents' children and grandchildren, allowing us to define transitions to grandmotherhood.<sup>1</sup> To calculate unbiased estimates of age at this transition, we used methods of survival analysis (Blossfeld et al., 2007). These methods required to reconstruct the *process of grandmotherhood* for a risk set of women who had provided retrospective information about the birth years of their first child and grandchild. The time axis of the process was age: The clock started with a women's date of birth and ended at the age at which the first grandchild was born (not necessarily born by the oldest child). If no grandchild was born, the process was censored at the interview date.

It is evident by implication that this process-based definition of grandmotherhood yielded an analytical sample restricted to women who were *mothers* at time of interview.<sup>2</sup> In the calculation of representative estimates for time to grandmotherhood, this restriction constituted a potential source of downward bias. Namely, conditioning on motherhood would bias the risk set toward younger mothers if the process of initial parenthood was right-

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<sup>1</sup> We considered only biological children of the respondents in the analysis.

<sup>2</sup> If the risk set included all women, survival times would be overestimated due to non-motherhood.

censored. Childless women aged 40 at the interview date, for example, would be excluded from the risk set although they might still experience motherhood and grandmotherhood in the future, at more advanced ages. We eliminated this source of downward bias in estimated age at grandmotherhood by constraining the risk set to women *aged 50 and over*, thus ensuring that the process of initial motherhood had been completed.<sup>3</sup> Additionally, we set an upper age limit of 79 to reduce selection effects of health and mortality and to allow for equal-sized age intervals in the definition of birth cohorts. In a final step, we constrained the sample to mothers who provided valid information on their own birth date as well as those of their (oldest) biological child and – if present – their (oldest) grandchild.

After all restrictions, our analytical sample comprised 1,754 mothers aged 50 to 79 at the interview date. Based on a survey question about where these women had lived in 1989 (i.e., before reunification), we divided this sample into two subsamples of East German ( $N = 678$ ) and West German ( $N = 1,076$ ) mothers. Within each subsample, we defined three cohorts, each encompassing an interval of 10 years: Women born in 1929–38 (pre-war cohort), 1939–48 (war cohort), and 1949–58 (post-war cohort). Table 1 shows descriptive statistics for each of these cohorts in East and West Germany.<sup>4</sup>

– Table 1 –

### *Assessing the Life-Course Context of Grandmotherhood*

A straightforward approach to assess the typical life course context of grandmotherhood is to restrict the attention to women who have already experienced this transition and to

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<sup>3</sup> This cut-off point is in line with the calculation of cohort fertility rates in the German official statistics.

<sup>4</sup> We used unweighted data for all analyses. The DEAS provides case weights that account for sample stratification by gender, East/West Germany, and age. We did not employ these case weights as we focused only on women and conducted separate analyses for East and West Germany as well as cohort groups that almost resembled the boundaries of the overall age stratification.

characterize these observed events in terms of the presence or absence of other roles (e.g., the proportion of women who were employed when their first grandchild was born). In the presence of right-censored observations, however, this deterministic approach would restrict the analysis to a selective sample of observed events. As noted, failure to account for right-censored observations in the process of grandmotherhood would bias the sample towards earlier transitions. The life course conditions associated with these transitions, thus, would not be representative of the typical context surrounding passages into the grandmother role. As indicated by the declines in the proportion of grandmothers and the mean ages at observed grandmotherhood across cohorts (Table 1), selection bias towards early events increases in more recent cohorts.

Therefore, we relied on a probabilistic approach, combining survival estimates for employment, parenting, and filial spheres with those obtained for the transition to grandmotherhood. To accomplish this, we determined the *quartiles of survival times to grandmotherhood* within each cohort, indicating at what age at least 25, 50, and 75 percent of a mother cohort had become grandmothers. These age values were used as anchor measures in the life-course analyses, representing early (age at 1<sup>st</sup> quartile), typical (age at median),<sup>5</sup> and late (age at 3<sup>rd</sup> quartile) timing of grandmotherhood.

We estimated separate survivor functions for other processes to calculate state probabilities at early, typical, and late age at grandmotherhood. This method enabled us to estimate, for example, the probability of being employed at the median age of grandmotherhood in a representative cohort of mothers. Table 2 provides an overview of the processes considered within the employment, parenting, and filial context. For each of these domains, we defined three life course states indicating the presence or absence of worker, parenting, and filial roles. Within the employment sphere, we assigned the time-constant status of “never

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<sup>5</sup> For a similar approach, see van Bavel and Nitsche (2013).

employed” to women never worked full-time in a paid job. Among those who had ever been in paid employment, we defined the status of “working” in the year of job entry and estimated survivor functions for job exit.<sup>6</sup>

– Table 2 –

Within the parenting sphere, we estimated survivor functions distinguishing between the status of “active parenting”, assigned if a women’s youngest child was still under 16,<sup>7</sup> “coresident adult children”, assigned if at least one child was still living in the mother’s home, and “empty nest”, assigned in the year in which the last child had moved out.<sup>8</sup> Within the filial sphere, survivor functions for the death of parents estimated the probabilities for “both parents alive”, “one parent alive”, and “both parents deceased”.

Based on all survivor functions, we characterized the life-course context of entry into the grandmother role by calculating probabilities for occupying discrete life course states within each of these three domains at every quartile of survival times to grandmotherhood. To apply this method, estimates for the quartiles of age at grandmotherhood had to be available in every cohort. Kaplan-Meier estimates could only be calculated for all quartiles if at least 75 percent of a cohort’s risk set had become grandmothers before the interview date. If this was not the case, we imputed the missing data using a generalized gamma model to extrapolate the

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<sup>6</sup> The year of job exit was defined as the last year of being in a full time job. Job exits comprised not only instances of full retirement but also different forms of early and partial retirement as well as transitions from employment to being a housewife or non-employment for other reasons. Years spent in employment, unemployment, further education, reeducation, and parental leave were counted as economically active periods.

<sup>7</sup> Before the age of 16, children in Germany are in many respects legally dependent on their parents.

<sup>8</sup> The German Aging Survey collected data on years of leaving the parental home only up to the fourth child (asked from the oldest to the youngest child). Approximately 95% of East German mothers and 96% of West German mothers in our sample had no more than four children. Because of lacking information on higher parities, age at empty nest might be slightly underestimated.

survivor curve of grandmotherhood in the respective cohort.<sup>9</sup> Among West German cohorts, extrapolated values were estimated for the third quartile in the war cohort and for the median and third quartile in the post-war cohort; among Eastern German women, extrapolation was required only for the third quartile in the post-war cohort. As shown by Figure A1 in the Appendix, the gamma functions provided a good fit to the survivor curves of grandmotherhood.<sup>10</sup>

## Results

### *The Timing of Grandmotherhood*

Figure 1 presents the quartiles of estimated time to grandmotherhood separately for three cohorts of East and West German mothers. Two patterns are easily discernible, a marked East-West gradient and pronounced postponement across cohorts. Among the pre-war cohort of East German mothers, 50 percent had become grandmothers already at the age of 47. In the war cohort, this median age increased to 49 while the third quartile surged upward, foreshadowing further postponements in subsequent cohorts. Among East German women born in the post-war years, the median age at grandmotherhood was estimated at 53 – a striking increase of 4 years compared with the war cohort. As the average gap between both cohorts amounted to only 10 years, this increase was equivalent to a postponement of almost

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<sup>9</sup> Compared to other parametric models such as Weibull or Gompertz, the generalized gamma model was better suited for our purposes because of its flexibility with regard to modeling also non-monotonic shapes of the hazard (Royston & Lambert, 2011). For the extrapolation, we estimated gamma models with cohort dummies as covariates and unconditional shape and scale parameters.

<sup>10</sup> In the same way, we extrapolated survivor functions for the transition to non-active motherhood, empty nest, and death of the first and second parent. For all these transitions, there was a close fit between generalized gamma models and non-parametric survivor functions. The only exception concerned the transition to retirement / inactivity. Parametric models performed poorly in capturing the cliff of this process around the age of 60. Therefore, we opted for a non-parametric extrapolation using a synthetic Kaplan-Meier estimator for the post-war cohorts. This estimator extrapolated these cohorts' survivor functions by carrying forward the corresponding estimates obtained from observed event times in the preceding (war) cohorts. Figures A1, A2, and A3 in the Appendix show survivor functions and extrapolations. Table A2 in the Appendix provides details about the methods used for extrapolation.

5 months per year. Across the entire range of cohorts under study, the average postponement from pre-war to post-war cohorts was estimated at approximately 3.6 months per year.

– Figure 1 –

Yet despite this steep rise, age at grandmotherhood among East German women remained considerably below the levels found in the West. Even the oldest (pre-war) cohort of West German women entered the grandmother role considerably later than the most recent cohort of women in the East. Survival estimates for West Germany revealed a median age as high as 55 already in the pre-war cohort. Across subsequent cohorts, grandmotherhood was further postponed, rising to age 57 in the war cohort and reaching an estimated value of 60 among those born in the post-war years. This rapid increase translated into an average postponement of 3 months per year across the entire range of birth cohorts under study. The total delay of grandmotherhood, thus, was largely similar in East and West Germany, despite differences in levels and trajectories of this change. Beyond postponement, there was also evidence for an extension of the grandmotherhood process across cohorts: The interquartile difference from early to late grandmotherhood increased from 9 (13) years in the pre-war cohort of East (West) German mothers to 14 (17) in the younger cohorts.

### *The Life-Course Context of Grandmotherhood*

Figure 2 shows how passages to grandmotherhood were embedded in other spheres of life. The figure presents median ages for all processes to illustrate typical sequences of transitions experienced in later life and to indicate how often the grandmother role overlapped with employment, parenting, and filial roles. To provide a comprehensive picture, we

complemented estimates for the later-life processes described above with median ages estimated from survivor functions for initial motherhood and entering the first job.

– Figure 2 –

The estimates for the transition to motherhood were consistent with those reported in the literature about fertility in East and West Germany (Goldstein & Kreyenfeld, 2011; Kreyenfeld, 2003), suggesting that our samples provided an accurate representation of mothers in both parts of the country. Compared with age at grandmotherhood, variation in these estimates was far less pronounced. This indicated that East-West and cross-cohort gradients in age at grandmotherhood were produced primarily by diverging fertility patterns in the younger generation. This was particularly obvious among the East German cohorts. These women's relatively early experience of motherhood remained largely constant over time, even decreasing slightly from pre-war to post-war cohorts. The marked and accelerating cross-cohort trend toward postponement of grandmotherhood, thus, was entirely attributable to delays and declines in their children's fertility. Among West German women, this was true only for initial postponements of grandmotherhood, whereas their own delays of motherhood (from age 24 to 26) contributed a substantial share to the subsequent rise from war- to post-war cohorts.

These differences highlight an important general insight to be gained from comparing East and West Germany: Namely, the demographic pathways that lead to delayed grandmotherhood might vary considerably, as this trend emerges as an outcome of fertility processes in successive generations. As a result, historical differences in fertility patterns of East and West Germany exert enduring effects on family life even though these differences have leveled off in recent years. The overall patterns of later grandmotherhood in the West

and postponement across cohorts translated into marked differences regarding the sequencing of grandmotherhood with other transitions. Within the parenting sphere, findings on active motherhood (i.e., having at least one child under 16) suggested little overlap with the grandmother role. The smallest interval of 3 years between the median age at the end of active motherhood (age 44) and the onset of grandmotherhood (age 47) was found in the pre-war cohort of East German women. Across cohorts, this interval widened at a rapid pace, reaching 11 years among those born in the post-war years. In the West, the corresponding interval expanded from 9 to 14 years, suggesting that the roles of an active mother and a grandmother were demographically distinct already in the pre-war cohort and became even more strongly sequenced across subsequent cohorts. Regarding the empty nest stage, cross-cohort trends showed a reversal of typical sequencing with grandmotherhood both in the East and West. In pre-war cohorts, initiation of the grandmother role, on average, preceded the empty nest stage. In post-war cohorts, this sequence was reversed, suggesting a marked decrease in overlap between mother and grandmother roles also with regard to the presence of adult children in the household.

With regard to filial roles, indicated by the presence or absence of surviving parents, results revealed a striking resemblance of trends in grandmotherhood and parental life expectancy. Postponements in grandmotherhood were almost paralleled by concurrent postponements in the loss of parents. Consequently, the sequencing of these transitions remained essentially unchanged, although both shifted substantially to more advanced ages. This applied equally to cohorts in the East and West, except for one fundamental difference: As cohorts of East German women experienced grandmotherhood relatively early, it typically preceded the loss of the second parent. In the West, these transitions occurred in a reverse – yet closely sequenced – order, suggesting considerable overlap between the caregiver roles of



a grandmother providing for young grandchildren and a daughter providing for elderly parents.

A relatively clear-cut picture emerged with regard to the sequencing of grandmotherhood and retirement. Among women who had entered the labor market, the majority were still employed when approaching the typical age at grandmotherhood, as grandmotherhood generally preceded retirement. In West Germany, however, median ages at these transitions converged across cohorts, coinciding at an estimated age of 60 among women born in the post-war years. In East Germany, grandmotherhood and retirement remained much more strongly sequenced, despite some convergence across cohorts.

– Figure 3 –

Figure 3 presents a closer look at the life-course context of grandmotherhood, showing estimated probabilities of occupying worker, parenting, and filial roles at the ages of early (1<sup>st</sup> quartile), on-time (median), and late (3<sup>rd</sup> quartile) grandmotherhood. Overlap with each role is represented by a filling level representing the estimated probabilities (in percent) of being in employment, being an active mother, having coresident children, and having surviving parents at the quartile ages of grandmotherhood. For the presence of each role within each quartile, change across cohorts is presented from left (pre-war cohorts) to right (post-war cohorts). Table A1 in the Appendix includes complete data about the estimates illustrated in Figure 3.

Note that the results presented in Figure 3 for the median age at grandmotherhood largely correspond to the sequencing of transitions illustrated in Figure 2: High filling levels (i.e., role overlap) reflect strong sequencing whereby grandmotherhood *preceded* the loss of other roles;

low filling levels indicate strong sequencing whereby grandmotherhood *followed* the loss of other roles; intermediate filling levels suggest that both transitions *co-occurred* in close sequence across the life course.

How often did grandmotherhood coincide with paid employment? Compared with Figure 2, the results shown in Figure 3 provide more detailed answers to this question.<sup>11</sup> In the East, two patterns are immediately recognizable: strong overlap in general and cross-cohort stability at early and on-time transitions. At early and median ages of grandmotherhood, virtually all East German women were employed. The effects of postponement are only visible at late transitions, showing a clear decline in the overlap between grandmother and worker roles across cohorts. Yet even among late grandmothers in East Germany, a substantial proportion had still not relinquished their worker role. In the West, the shares of those who worked upon becoming a grandmother were much lower. Cohort effects of increasing labor force participation transpired only for early transitions. For on-time and late transitions, these effects were balanced out by the postponement of grandmotherhood. In the most recent cohort, the probability of being employed at the median age of grandmotherhood was estimated slightly below the 50 percent mark – a striking difference of almost 40 percentage points compared with their East German counterparts.

Within the parenting sphere, decline across cohorts emerged as the overriding pattern. Overlaps between the roles of a grandmother and an active mother vanished almost entirely. Even among early grandmothers, the proportion of still-active mothers declined steeply to very low levels in post-war cohorts. Furthermore, grandmotherhood increasingly coincided with the empty nest stage: At the median age of grandmotherhood, the probability of having coresident children declined from above to below 50 percent, indicating the reversal of the typical sequencing of grandmotherhood and the empty nest stage. Despite this trend, however,

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<sup>11</sup> Note that unlike Figure 2, Figure 3 also accounted for women who had never been employed.

the presence of coresident children upon transition into the grandmother role remained a relatively common occurrence, especially among East German women.

Lastly, the results for the filial sphere revealed clear-cut patterns. First, as the postponement of grandmotherhood was paralleled by concurrent increases in life expectancy, overlap with filial roles remained remarkably stable across cohorts. Second, the probability of having lost both parents upon transition to grandmotherhood was higher among West German women. Less than half of them had a surviving parent at the median age of grandmotherhood – compared to approximately two thirds of East German women. Regarding role competition, however, it is important to note that these findings pertain only to the presence or absence of a surviving parent. As involvement in the role of a filial caregiver occurs primarily toward the end of parents' lives, actual competition between the caregiver roles of a grandmother providing childcare and a daughter providing parent care might thus occur more frequently if both transitions are sequenced more closely.

## **Discussion**

This study is the first to explore the postponement of grandmotherhood, investigating how timing and life course context of this transition have changed across cohorts. Our findings direct attention to a so-far neglected demographic trend that is striking in scope and unlikely to slow down in the near future. From pre-war to post-war cohorts of East and West German mothers, age at grandmotherhood increased at a rapid pace of three months per year. Over the course of only two decades, the median age at grandmotherhood has been postponed by approximately five years, increasing from the late-40s toward the mid-50s in East Germany and from the mid-50s toward the early 60s in West Germany. Despite the recent convergence in fertility rates between East and West Germany, thus, the historical legacy of past fertility

regimes continues to shape family life by pronounced differences in the timing of grandmotherhood.

The trend towards postponement of grandmotherhood has been accompanied by substantial change as well as remarkable stability in the life-course context surrounding the onset of the grandmother role. Three patterns stand out. First, grandmother and worker roles coincided frequently, particularly in the East but also in the West of Germany. This configuration remained largely stable across cohorts, despite an overall downward trend caused by the rapid postponement of grandmotherhood. These findings provide compelling evidence that popular depictions of elderly grandmothers providing childcare to very young grandchildren within a context of leisure and retirement reflect a demographic myth (Hagestad & Lang, 1986, p. 117).

Second, parent and grandparent roles have increasingly decoupled. Overlap between the roles of an active mother and a grandmother has become a rarity in the East and has virtually disappeared in the West of Germany – even among those who experienced grandmotherhood relatively early. The presence of coresident children upon grandmotherhood remained common, however, despite a downward trend across cohorts. Third, frequent overlap and stability over time was found for the intersection of grandmother and filial roles, as postponements in grandmotherhood largely resembled concurrent increases in parents' life expectancy (Oeppen & Vaupel, 2002). These findings direct attention to the neglected nexus between the caregiver roles of a grandmother providing childcare and a daughter providing parent care. This applied especially to West German women who often experienced the onset of grandmotherhood and the loss of parents in close sequence across their life courses.

Taken together, our findings on the life-course context of grandmotherhood supported three general conclusions. First, the postponement of grandmotherhood has led to a moderate decline in total overlap between the grandmother role and concurrent involvement in

potentially competing roles. Second, the remaining overlaps remain substantial – especially in early but also in on-time transitions to grandmotherhood. Third, the worker role features most prominently among overlapping roles while parenting roles have lost ground to filial responsibilities.

It is important to note that these conclusions are limited to this study’s demographic account of the presence, absence, and sequencing of roles in work and family spheres. In this sense, our findings indicated only the *potential* for role involvement, overlap and competing demands in different spheres. Our research design did not allow assessing whether, and to what extent, women actually *enacted* caregiver roles toward their grandchildren and/or parents, and whether manifest conflict ensued between these roles along with consequences for outcomes such as physical and mental health. To address this limitation, future studies should focus more directly on the performance of caregiver and worker roles to unravel how the potential for older women’s multiple role involvements played out in practice.

We also note two methodological limitations of the present study. First, to provide an up-to-date portray of the timing and context of grandmotherhood, we had to extrapolate some estimates for more recent cohorts. Parametric approximations, however, provided a good fit to observed survivor curves, suggesting that our extrapolations yielded accurate estimates for the missing information. Second, our method of assessing intersecting processes on the basis of state distributions at the quartile ages of grandmotherhood produced unbiased results only if grandmotherhood was not endogenous to these processes. Endogeneity might occur, for instance, if children postponed fertility until their mothers had retired and were thus more readily available as sources of childcare. If this was true, our method would underestimate the proportion of those who are retired when experiencing the transition to grandmotherhood. Although not entirely implausible, we are not aware of any empirical evidence in support of this contention.

With regard to a comparative perspective on grandmotherhood, this study's findings revealed great variation across socio-historical and institutional contexts, suggesting that important additional insight can be gained from further comparative analysis including more countries. For our descriptive and exploratory purposes, we focused primarily on East-West differences in the employment and fertility context within Germany. Regarding conflicting role demands, the social policy context represents a further important dimension along which to explore diverging experiences in the transition to grandmotherhood. Although our results indicated a higher proportion of multiple role involvement in East Germany, for instance, relatively high levels of public childcare coverage might have alleviated the burden for grandmothers – at least for those who experienced this transition in the context of the Former GDR. In recent years, analysts of grandparenting have increasingly adopted a comparative perspective to investigate how the provision of childcare interacted with the cultural and policy environment surrounding the grandparent role (Glaser et al., 2010; Hank & Buber, 2009; Jappens & van Bavel, 2009). The postponement of grandmotherhood into later periods of the life course, however, has not been considered in these studies. Future research along these lines should link this demographic change not only to the individual life-course context surrounding it but also to the broader social context in which it unfolds.

A general limitation of this study concerns the social stratification of grandmotherhood. For the descriptive purposes of our analysis, we did not consider how timing and context of passages into the grandmother role differed across social positions although it appears likely that the transition to grandmotherhood is, in fact, deeply stratified. In this regard, at least three notes are warranted.

Firstly, the well-known educational gradient in the timing of fertility will obviously translate into educational differences in age at grandmotherhood and possibly also involve diverging trends in the postponement of this transition. Unfortunately, our cohort samples

were too small to permit in-depth explorations of educational differences. In exploratory analyses (not shown), cross-cohort trends in the timing of grandmotherhood emerged also within educational groups, suggesting that postponements were only partly attributable to compositional changes in educational attainment. Only among the low-educated, the postponement of grandmotherhood might have been less pronounced or even absent. However, the limited case numbers available in each of our cohorts – particularly low-educated women in younger cohorts – precluded the calculation of robust estimates within educational groups. In future research, it would be desirable to assess trends in grandmotherhood more comprehensively on the basis of larger analytical samples.

A second aspect concerns the experience of grandmotherhood along with the presence or absence of conflicting involvements. According to social class differences in fertility timing (Blossfeld & Huinink, 1991), for instance, we can expect a significantly higher share of early (“off-time”) grandmothers in disadvantaged families. Consequently, the burdens associated with this role might disproportionately affect low-SES grandmothers. Grandmotherhood, thus, has the potential to introduce and aggravate cumulative advantages and disadvantages in older age (Dannefer, 2003). In this regard, we consider it worthwhile to explore how the birth of grandchildren affects health outcomes in older women and whether these effects differ across social positions.

A third perspective concerns the role of timing and context of grandparenthood in the reproduction of social inequality. In recent years, there has been a surge of interest in grandparents’ influence on the process of status attainment (Mare, 2011; Jæger, 2012; Chan & Boliver, 2013; Modin et al., 2012). This line of research frequently refers to the increasing duration of lifetime that grandparents and grandchildren share. The underlying premise is that a rise in “exposure” to living grandparents entails a rise in grandparental influence on child outcomes.

An important implication of the present study is that this argument should be reconsidered on at least two grounds. First, the lifetime of grandparents and grandchildren does not necessarily increase. As shown by this investigation, there is a remarkable similarity between this increase and the concurrent rise in life expectancy, suggesting equal spacing of transitions within longer lives. The postponement of grandmotherhood, thus, constitutes a powerful counterbalancing force, offsetting or even prevailing over concurrent increases in life expectancy. Indeed, recent demographic projections for Germany have suggested that the lifetime shared by grandmothers and their grandchildren might even decrease in the longer run (Grünheid & Scharein, 2011).

Second, the life course perspective advanced in this study suggests a more dynamic view of grandparent effects on child outcomes, considering the context in which these effects might transpire. This view directs attention away from the mere demographic overlap of shared lifetime to the amount and quality of time that grandparents and grandchildren *actually* share. “Late” grandparents, for example, might exert more influence on child outcomes because their involvement in early socialization is not constrained by a worker role. In this regard, a dynamic account will open up new avenues along which to explore variation in the experience and outcomes of grandparenthood in all family generations.



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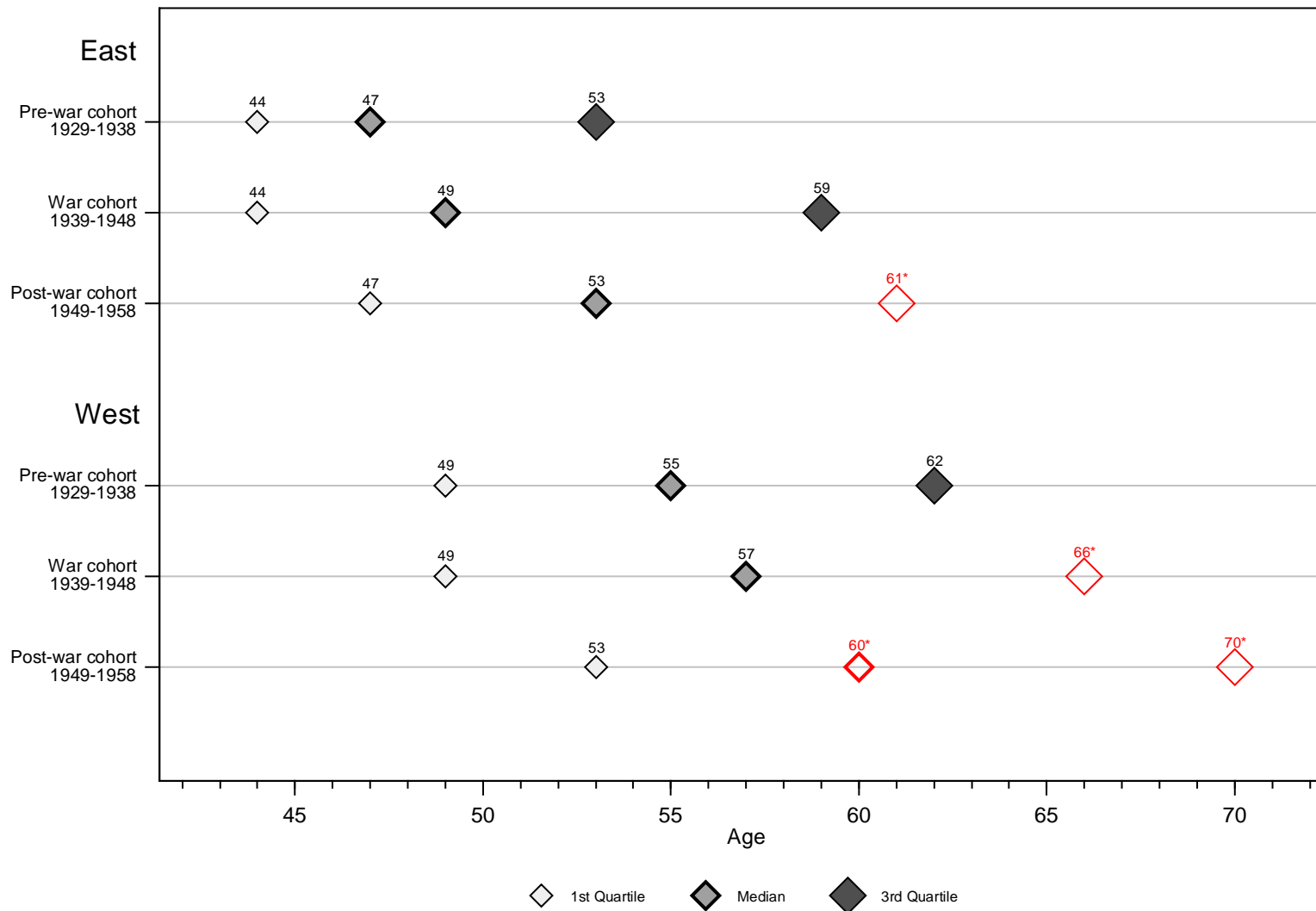


Figure 1. Cross-cohort Trends in Age at Grandmotherhood

Notes: German Aging Survey, basic sample 2008, own calculations. Samples of mothers aged 50 to 79 in 2008.  $N = 1,076$  (West);  $N = 678$  (East). \* Extrapolated values.

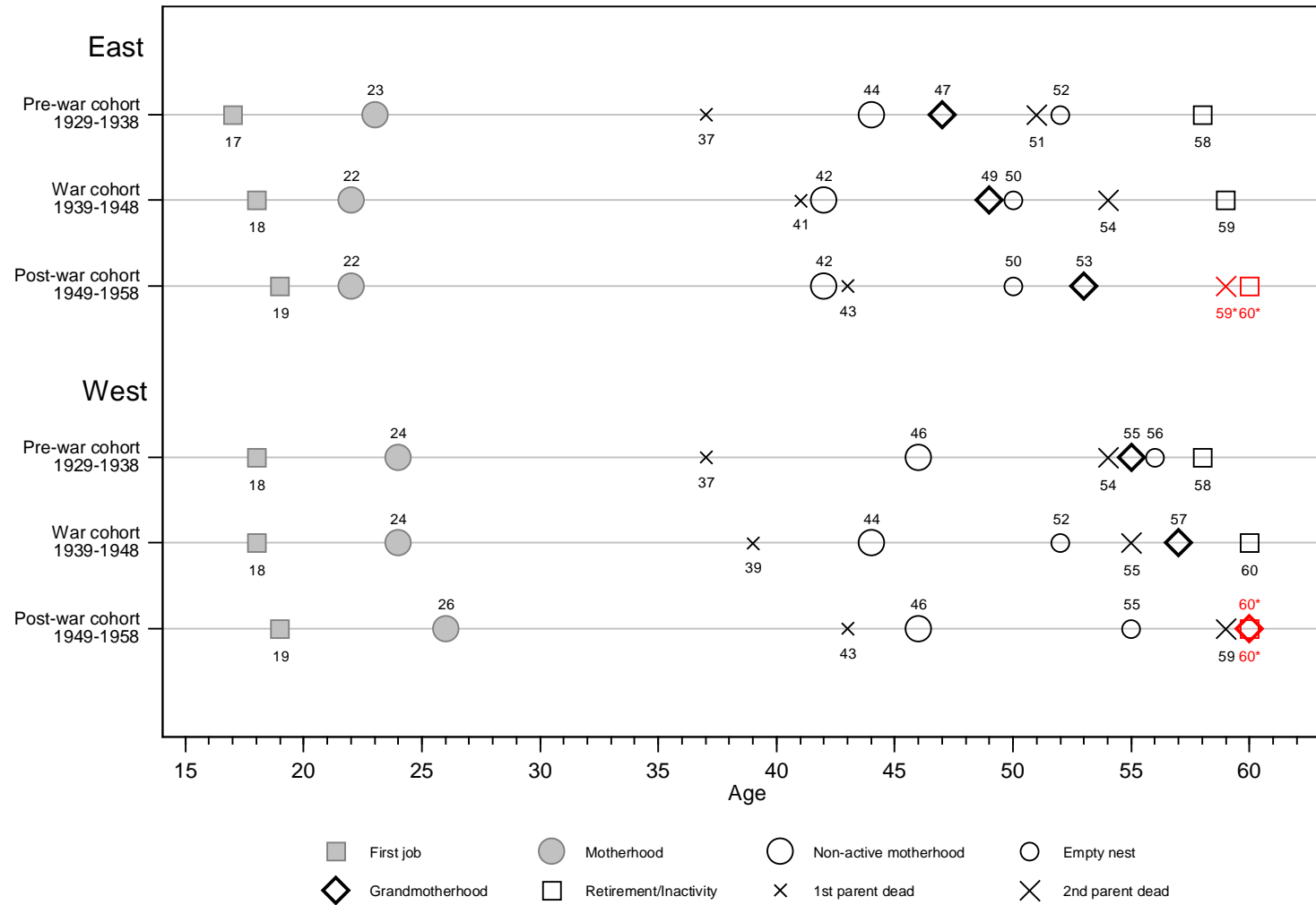


Figure 2. Cross-cohort Trends in the Sequencing of Grandmotherhood and Other Life Transitions

Notes: German Aging Survey, basic sample 2008, own calculations. Samples of mothers aged 50 to 79 in 2008.  $N = 1,076$  (West);  $N = 678$  (East).

Median ages are shown for each process. \* Extrapolated values.

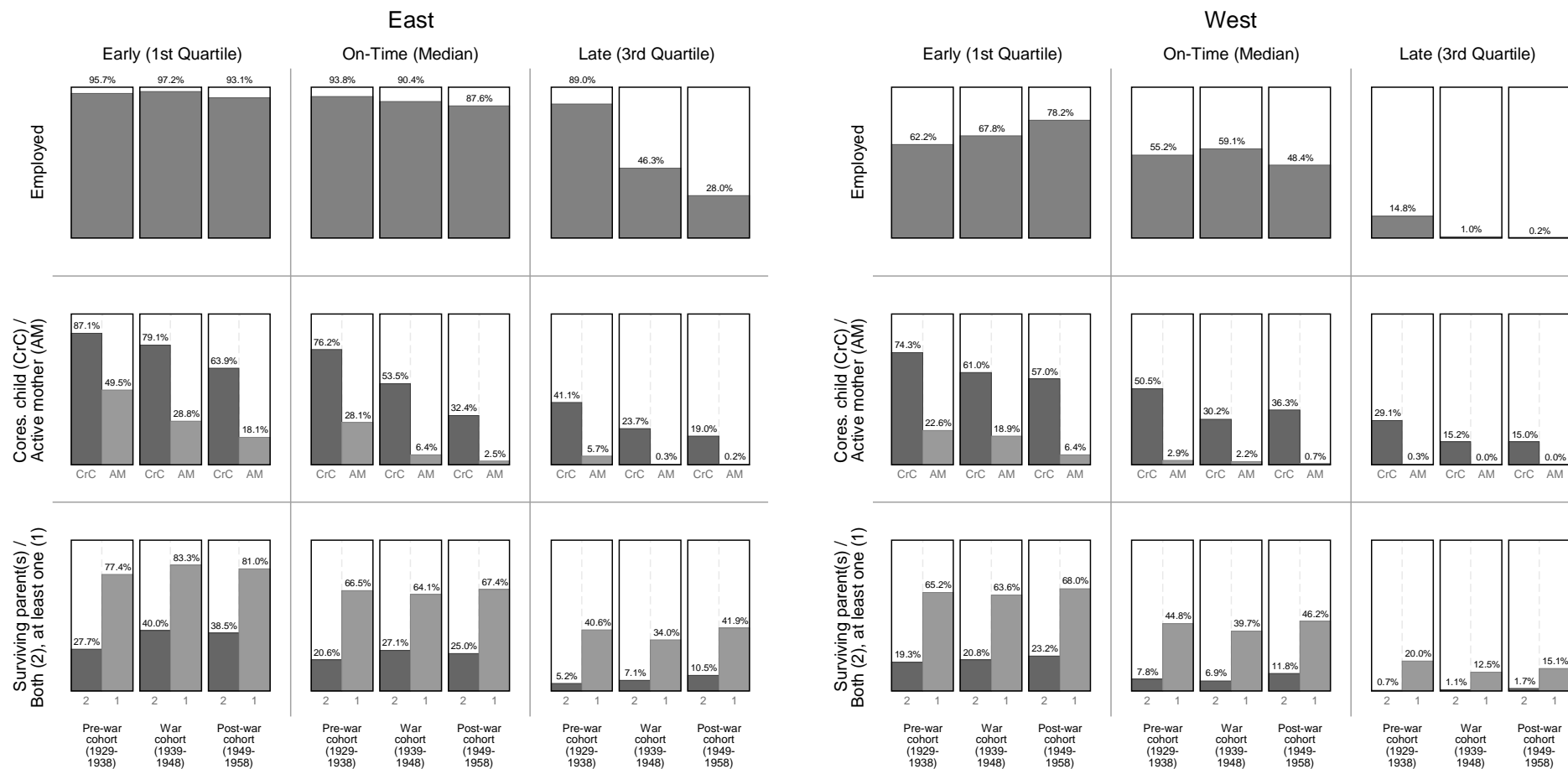


Figure 3. Cross-cohort Trends in the Life-Course Context of Grandmotherhood: Overlap with Roles in Employment, Parenting, and Filial Spheres

Notes: German Aging Survey, basic sample 2008, own calculations. Samples of mothers aged 50 to 79 in 2008.  $N = 1,076$  (West);  $N = 678$  (East). Filling levels (max. 100%) represent probabilities of occupying a life-course state at the quartile ages of grandmotherhood.

Table 1. Descriptive Statistics for Cohort Samples of East and West German Mothers

		East German Mothers				West German Mothers			
		Pre-war cohort 1929-38	War cohort 1939-48	Post-war cohort 1949-58	Total	Pre-war cohort 1929-38	War cohort 1939-48	Post-war cohort 1949-58	Total
Age	(mean)	73.5	64.8	54.2	63.6	73.5	64.7	54.4	64.0
Educational level <sup>a</sup>									
Low	(%)	26.7	6.4	1.2	10.8	39.4	21.0	10.1	23.1
Intermediate	(%)	53.8	59.4	56.2	56.5	48.5	60.1	56.2	55.1
High	(%)	19.5	34.3	42.6	32.7	12.1	18.9	33.7	21.8
Number of biological children <sup>b</sup>	(mean)	2.5	2	2	2.1	2.4	2.1	2.0	2.2
Coresident children	(%)	18.9	19.4	31.7	23.8	19.8	16.8	50.7	29.3
Children < 16 years	(%)	0.0	0.0	3.2	1.2	0.0	0.0	5.8	2.0
Grandmother	(%)	91.0	80.4	53.8	73.9	86.8	70.9	30.7	62.3
Number of grandchildren <sup>c</sup>	(mean)	3.7	2.6	1.2	2.4	3.2	2.3	.6	2.0
Age at observed grandmotherhood	(mean)	47.8	47.9	46.8	47.6	53.8	52.1	49.0	52.3
Ever full-time employed <sup>d</sup>	(%)	97.6	99.5	100.0	99.1	91.2	96.4	97.2	95.0
	(% missings)	(.0)	(.5)	(.8)	(.4)	(3.5)	(2.4)	(2.2)	(2.7)
Retired / Inactive <sup>d</sup>	(%)	100.0	87.6	17.8	65.6	100.0	83.4	21.6	66.8
	(% missings)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)	(.0)
One parent dead	(%)	100.0	96.2	75.1	89.0	100.0	97.7	76.7	90.7
	(% missings)	(26.2)	(28.8)	(17.7)	(23.9)	(20.6)	(17.8)	(9.6)	(16.0)
Both parents dead	(%)	98.7	81.4	36.6	68.8	97.8	81.3	36.4	69.8
	(% missings)	(26.2)	(28.8)	(17.7)	(23.9)	(20.6)	(17.8)	(9.6)	(16.0)
Total	N	210	219	249	678	340	371	365	1,076

Notes: German Aging Survey, basic sample 2008, own calculations. All variables measured at the time of interview. <sup>a</sup> Derived from International Standard Classification of Education (ISCED): Low = pre-primary to lower secondary education (ISCED levels 0-2); Intermediate = secondary to post-secondary non-tertiary education (ISCED levels 3-4); High = first to second stage of tertiary education (levels 5-6). <sup>b</sup> Range 1 to 8. <sup>c</sup> Range 0 to 25. <sup>d</sup> Values calculated from subsamples conditional on non-missing values, percentage of missing values in parentheses.



Table 2: *Life Course Processes in the Employment, Parenting, and Filial Sphere*

Life-course domain	Description	Estimated Duration
Employment context		
Never employed	Never worked full-time	Time-constant
Employed	Ever had paid full-time job and not retired/inactive	Birth until age at labor market exit
Retired / Inactive	Retired or no longer employed (inactive)	
Parenting context		
Active mother	$\geq 1$ child(ren) aged $< 16$	Birth until age at which the youngest child turned 16
Coresident children	$\geq 1$ coresident child(ren)	Birth until age at which the last child moved out
Empty nest	No coresident children	
Filial context		
Both parents alive	Biological mother and father alive	Birth until age at 1 <sup>st</sup> parent's death
One parent alive	Mother or father deceased	Birth until age at 2 <sup>nd</sup> parent's death
Both parents dead	Mother and father deceased	

## Appendix

Table A1. *Life-Course Context of Grandmotherhood: Estimated State Probabilities (in %) by Cohort and East/West*

Grandmotherhood	Probability (%)	East German Mothers			West German Mothers		
		Pre-war cohort 1929-38	War cohort 1939-48	Post-war cohort 1949-58	Pre-war cohort 1929-38	War cohort 1939-48	Post-war cohort 1949-58
Early (1 <sup>st</sup> quartile)	Never employed <sup>a</sup>	2.4	0.5	0	8.8	3.6	2.8
	Employed <sup>b</sup>	95.7	97.2	93.1	62.2	67.8	78.2
	Coresident children	87.1	79.1	63.9	74.3	61.0	57.0
	Active mother	49.5	28.8	18.1	22.6	18.9	6.4
	Both parents alive	27.7	40.0	38.5	19.3	20.8	23.2
	At least one parent alive	77.4	83.3	81.0	65.2	63.6	68.0
On time (median)	Never employed <sup>a</sup>	2.4	0.5	0	8.8	3.6	2.8
	Employed <sup>b</sup>	93.8	90.4	87.6	55.2	59.1	48.4 <sup>†</sup>
	Coresident children	76.2	53.5	32.4	50.5	30.2	36.3*
	Active mother	28.1	6.4	2.5	2.9	2.2	0.7
	Both parents alive	20.6	27.1	25.0	7.8	6.9	11.8*
	At least one parent alive	66.5	64.1	67.4	44.8	39.7	46.2*
Late (3 <sup>rd</sup> quartile)	Never employed <sup>a</sup>	2.4	0.5	0	8.8	3.6	2.8
	Employed <sup>b</sup>	89.0	46.3	28.0 <sup>†</sup>	14.8	1.0	0.2 <sup>†</sup>
	Coresident children	41.1	23.7	19.0*	29.1	15.2	15.0*
	Active mother	5.7	0.3*	0.2*	0.3*	0.0*	0.0*
	Both parents alive	5.2	7.1	10.5*	0.7	1.1	1.7*
	At least one parent alive	40.6	34.0	41.9*	20.0	12.5	15.1*

Notes: German Aging Survey, basic sample 2008, own calculations. <sup>a</sup> Time-constant. <sup>b</sup> Probability of being still employed (i.e., non-retired or inactive) conditional on the probability of ever being employed. \* Extrapolated using generalized gamma models. <sup>†</sup> Extrapolated using synthetic Kaplan-Meier estimates from the preceding cohort (see Table A2).

Table A2. *Methods for Extrapolating Survivor Functions*

Model for Extrapolation	Formulation
Generalized Gamma Model (for parametric extrapolation of survivor functions)	$S(t) = \begin{cases} 1 - I(\gamma, u), & \text{if } k > 0 \\ 1 - \Phi(z), & \text{if } k = 0 \\ I(\gamma, u), & \text{if } k < 0 \end{cases}$ <p>with <math>\gamma =  k ^{-2}</math>, <math>z = \text{sign}(k)\{\log(t) - \mu\}/\sigma</math>, <math>u = \gamma e^{ k z}</math>, <math>\Phi(z)</math> the standard normal cumulative distribution, and <math>I(\gamma, u)</math> the incomplete gamma function (Cleves et al., 2010). Event times are assumed to follow a gamma distribution that has three parameters <math>\mu</math>, <math>k</math>, and <math>\sigma</math> to be estimated from the data.</p> <p>Gamma models were estimated by conditioning <math>\mu</math> on cohort dummies as covariates.</p>
Synthetic Kaplan-Meier Estimator (for non-parametric extrapolation of survivor functions)	$\hat{S}(t)_c = \begin{cases} \prod_{j t_{j,c} \leq t, t \leq T_c} q_{j,c}, & \text{if } c = 1 \\ \prod_{j t_{j,c} \leq t, t \leq T_c} q_{j,c} \prod_{i T_c < t_{i,c-1} \leq t, t \leq T_{c-1}} q_{j,c-1}, & \text{if } c > 1 \end{cases}$ <p>for <math>c = 1, 2, 3</math> and</p> <p>with <math>\hat{S}(t)_c</math> as a non-parametric (synthetic) estimator of cohort <math>c</math>, <math>q_{j,c} = (n_{j,c} - d_{j,c})/n_{j,c}</math> as the conditional probability of surviving until the observed event time <math>t_j</math> (<math>n_{j,c}</math> as the number of individuals at risk and <math>d_{j,c}</math> as the number of events), and <math>T_c</math> as the maximum time at censoring observed for cohort <math>c</math> (notation adopted from Cleves et al., 2010).</p>

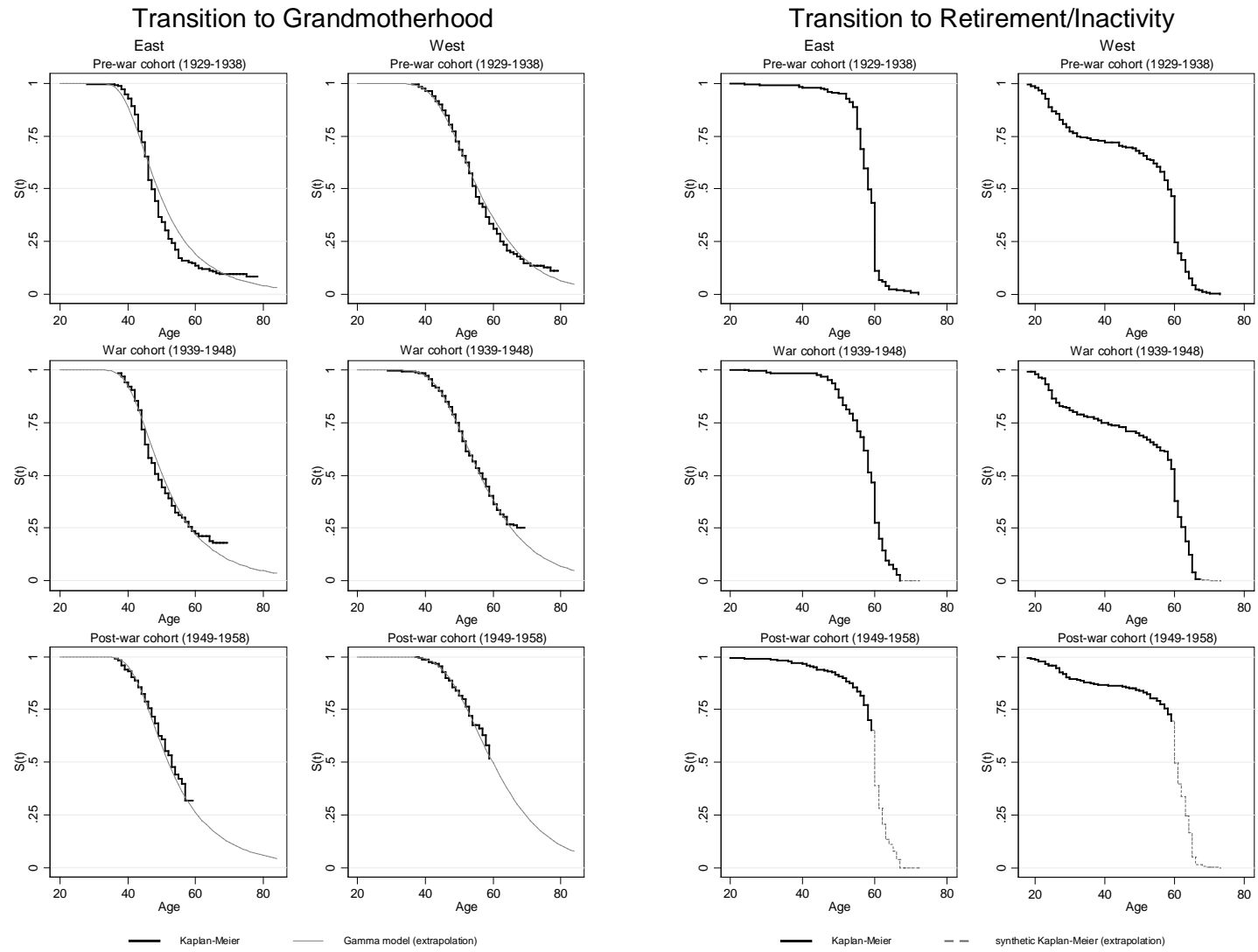


Figure A1. *Survivor Functions with Extrapolation for Grandmotherhood and Retirement/Inactivity*

Notes: German Aging Survey, basic sample 2008, own calculations.

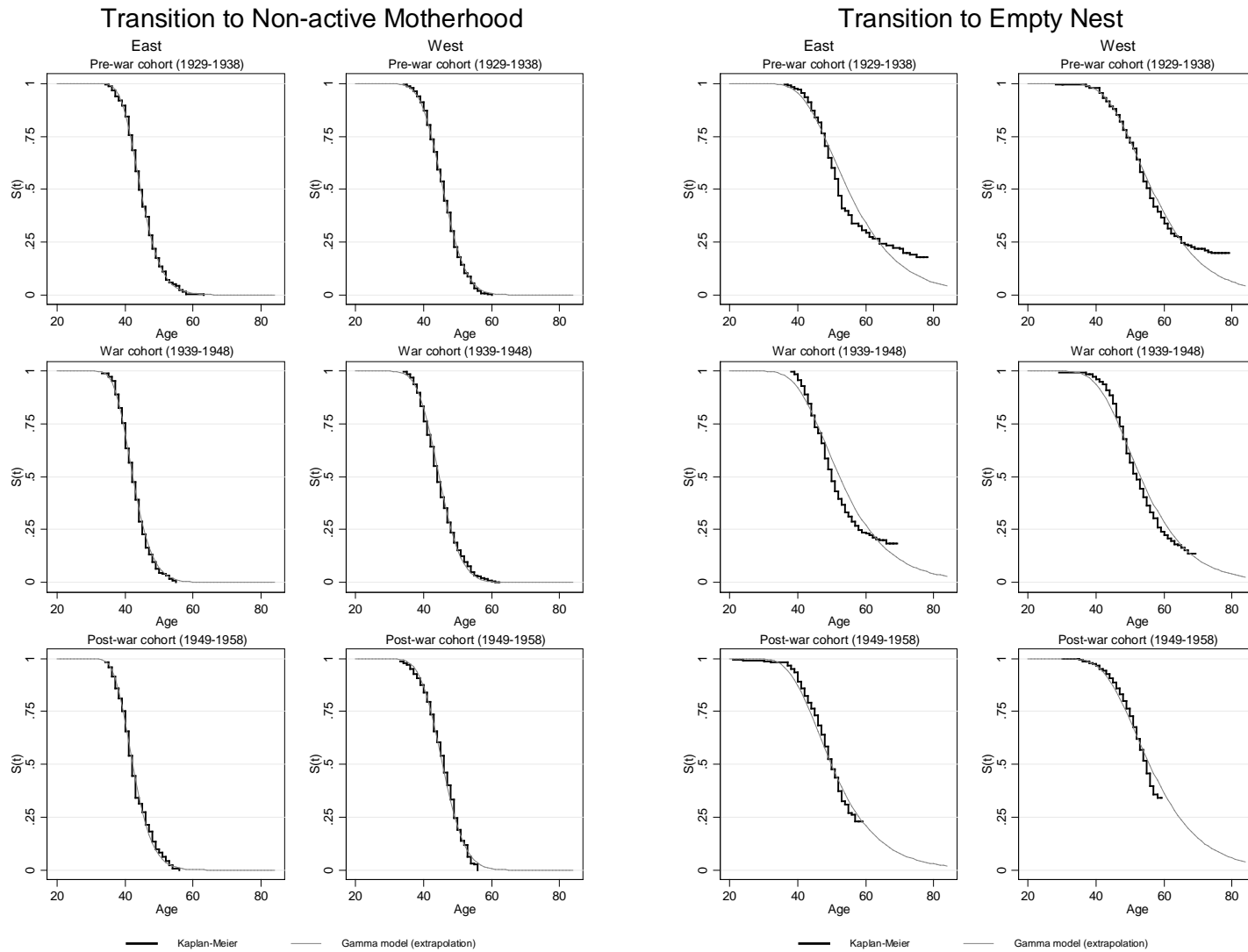


Figure A2. *Survivor Functions with Extrapolation for Non-active Motherhood and Empty Nest*

Notes: German Aging Survey, basic sample 2008, own calculations.

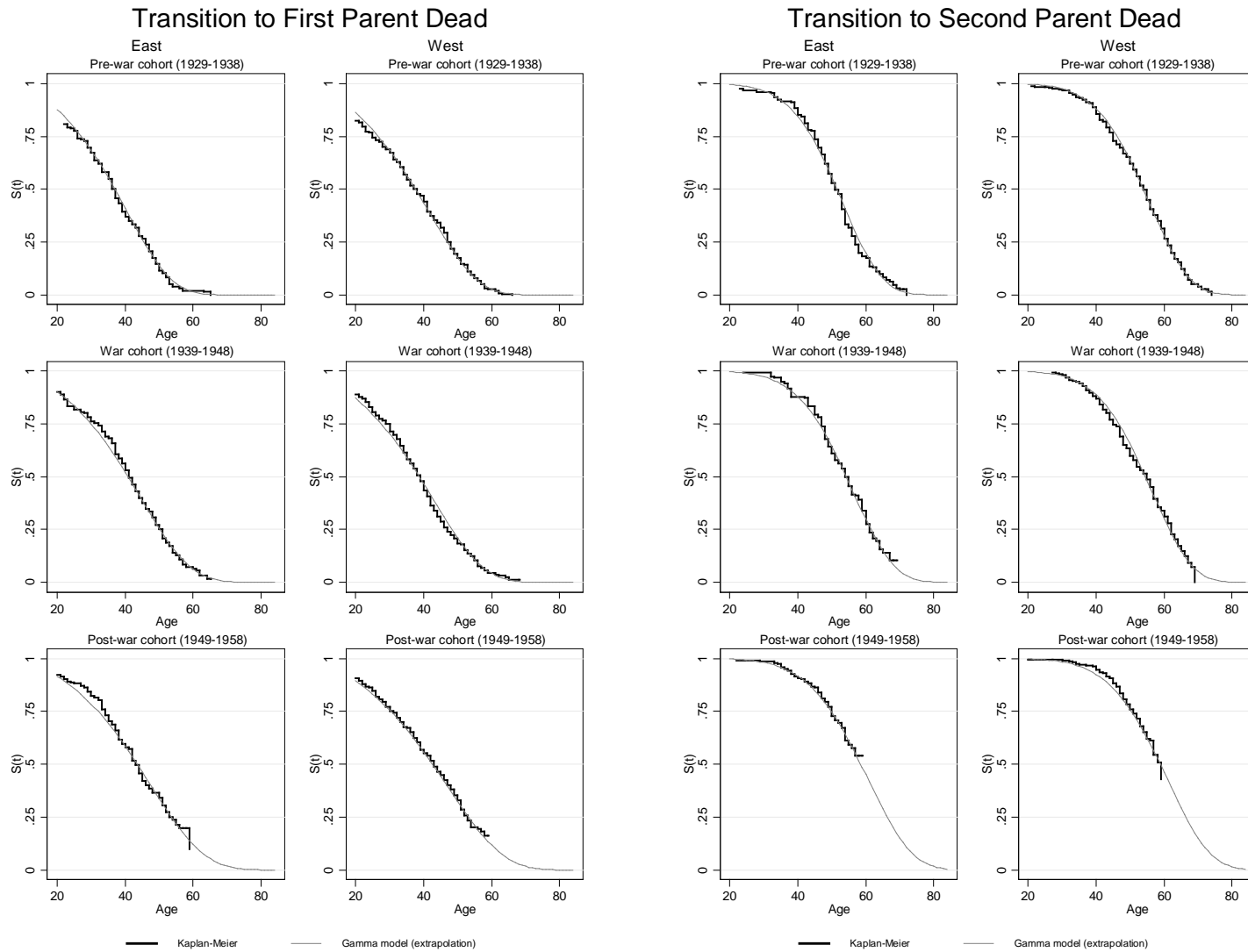


Figure A3. *Survivor Functions with Extrapolation for First and Second Parent Deceased*

Notes: German Aging Survey, basic sample 2008, own calculations.