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Fraying Families: Demographic Divergence in the Parental Safety Net

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Demographic Divergence in Parental Safety-Nets

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ABSTRACT

Parents are increasingly supporting their children well into their adulthoods and often serve as safety nets during periods of economic and marital instability. Improving life expectancies and health allow parents to provide for their children longer but greater union dissolution among parents can weaken the safety nets that they can create for their adult children. Greater mortality, non-marital childbearing, and divorce among lower socioeconomic (SES) families may be reinforcing inequalities across generations. This article examines two cohorts aged 25-49 from the 1988 (n = 7,246) and the 2013 (n = 7,014) Panel Study of Income Dynamics Roster and Transfers Files. Adults with college degrees had two surviving parents who are living together for 1.8 years longer than non-graduates in 1988. This disparity increased by five years to 6.8 years in 2013. This increase in disparity is driven predominantly by higher rates of union dissolution among parents of adults with less education. Growing differences in paternal mortality also contributed to the rise in inequality.

Relationships with parents are becoming increasingly consequential for adult children even as they gain financial independence and form new households (Bengtson 2001; Swartz 2009). Many parents remain actively engaged in their children's lives throughout their college years and beyond, often contributing to living expenses, assisting with childcare, and helping them to find their first jobs (Hamilton 2016). They provide safety nets for their adult children who are facing greater marital instability and economic uncertainty than previous cohorts (Furstenberg, Rumbaut, and Settersten 2005). Norms of familial support remain strong between parents and children even across separate households (Logan and Spitze 1996; Lye 1996; Rossi and Rossi 1990). Parents respond to their children in times of need (Riley and Riley 1993; Ryff, Schmutte, and Lee 1996; Ward and Spitze 2007) acting as the "Family National Guard" (Hagestad 1996). In his Burgess Awards Lecture, Bengtson (2001) went further to argue that intergenerational support and involvement may be a viable alternative to the nuclear family.

The family structure may influence the strength of the parental safety-net. Parents who are still married to each other are more likely than divorced, widowed, or remarried parents to rally their resources in response to their children's needs (Aquilino 1997; Hogan, Eggebeen, and Clogg 1993; Lawton, Silverstein, and Bengtson 1994; Pezzin and Shone 1999; Silverstein and Bengtson 1997). Relationships with fathers, in particular, are sensitive to parents' divorce (Curran, McLanahan, and Knab 2003; Swartz 2009). Even after parents' remarriage, adult children in complex families receive less

financial and practical help than their peers whose parents remain together (Eggebeen 1992a; Furstenberg, Hoffman, and Shrestha 1995; Light and McGarry 2004; Pezzin, Pollak, and Schone 2008; Pezzin and Shone 1999; Seltzer and Bianchi 2013). Step-parents often bring step-siblings and half-siblings to the family who may compete for resources (Aquilino 2005) and biological parents are less eager to send money to children that they had with divorced partners (Eggebeen 1992b; Furstenberg et al. 1995; Lopez Turley and Desmond 2011).

Parents' timing of childbearing, divorce, and mortality determine how long an adult child can access the latent source of support provided by parents who live together. This article examines ages at childbirth, divorce, and mortality *among parents* to address the following questions. How many years are adults expected to have parents who are both alive and who are living with each other? And, does the expected number of years differ by the adult child's educational attainment? These questions are important to ask for two reasons. First, there have been significant demographic changes during the latter half of the 20th Century. Increases in life expectancy (Wilmoth 2000) mean that adults are more likely to have two surviving parents for longer (Watkins, Menken, and Bongaarts 1987). Increases in non-marital childbearing and divorce have resulted in more people with parents who are not married to each other than before (Seltzer and Bianchi 2013). Second, these demographic changes did not occur evenly across the socioeconomic stratum. The rise in single parenthood was greater among

people with less education (McLanahan 2004), and their life expectancies did not grow as fast as people with more education (Sasson 2016). These divergences in demographic trends foreshadow a fraying of intergenerational support networks among families with fewer socioeconomic resources. This article examines differences in the intergenerational family structure by quantifying the extent to which changes and disparities in parents' divorce and mortalities have contributed to inequalities in the strength of the intergenerational support system among adult children.

Specifically, this article compares the expected number of years that a college graduate has with two parents who are married to each other against the expected number of years with two married parents of non-college graduates. The analyses focus on adults aged 25 to 49 in 1988 and same-aged adults in 2013. It decomposes the change in inequality between college graduates and non-graduates into differences in parents' rates of union dissolution and mortalities while accounting for changes in ages at childbirth.

This article and its findings make three distinct contributions to the literature. First, it quantifies the changes in the intergenerational family structure in recent decades. It is a loose update of the seminal paper written by Watkins, Menken, and Bongaarts (1987) that documented the increase in the number of years that an adult would spend as someone's child from 1800 to 1980. This article continues from where Watkins and her coauthors left off and examined the twenty-five-year period between 1988 and 2013. Second, this article extends the "diverging destinies" of children born after

the Second Demographic Transition. Sarah McLanahan (2004) showed that the rise in single households disproportionately affected children of mothers with less education. These children are now adults, and this article examines the divergence in the intergenerational family structure. The third contribution is a methodological one. The analyses presented here adopts Brass's Indirect Estimation Method (Brass 1975; Brass and Hill 1973)—a technique developed to estimate mortality in contexts with limited data—to derive parameters in constructing multigenerational life tables. Prior simulations of "generational overlap" were based on mortality and fertility rates that were directly observed in populations (Goodman, Keyfitz, and Pullum 1974; Murphy 2011; Song and Mare 2017; Wachter 1997). The adaptation of Brass's approach allowed greater latitude in studying sub-groups using the Panel Study of Income Dynamics (PSID), a dataset with rich variables but that also has key missing pieces.

Background and Motivation

Parents' sense of obligation towards their children endures throughout their adulthoods (Logan and Spitze 1996; Lye 1996; Rossi and Rossi 1990; Seltzer and Bianchi 2013). While parents may not give time or money transfers to their adult children on a regular basis, several studies show a high consensus on parents' willingness to provide help if their children need it (Ganong and Coleman 1999; Rossi and Rossi 1990; Seltzer, Lau, and Bianchi 2012). Parents are likely to view their resources as a safety net for their adult children when they encounter hardships such as divorce, job

change, and unstable housing (Ryff et al. 1996; Shanahan 2000; Swartz 2009). These strong norms of parental obligations are durable; parents are likely to respond to their adult children's needs regardless of previous relationship quality (Ward and Spitze 2007).

The safety nets that parents provide to their adult children are consequential (Bengtson 2001). Parents often provide financial and practical (such as childcare, household help, transportation, and caregiving) help to their adult children when they need it (Eggebeen and Davey 1998; Eggebeen and Hogan 1990; Hogan et al. 1993; Silverstein 2006; Silverstein and Bengtson 1997). Parents are particularly responsive to the needs of adult children who are single parents of young grandchildren (Hogan et al. 1993). Studies estimate that grandparents provide between 17 and 29 billion dollars in unpaid childcare (Silverstein 2006; Silverstein and Marenco 2001). Adult children co-reside with their parents during economic crises (Seltzer et al. 2012), when they have poor economic prospects (Kaplan 2012), and to receive help when raising young children as single mothers (Mutchler and Baker 2009). Furthermore, adults also view their parents as a safety net. Cooney and Uhlenberg (1990)'s analysis of the 1987 National Survey of Families and Households (NSFH) showed over half of adult children under 45 to identify their parents as a source of help in case of emergency, financial or emotional need.

The frequency and the intensity with which parents respond to their adult children's needs are affected by the presence and the relationship

between parents (Seltzer and Bianchi 2013). Widowed parents or parents who live alone have fewer resources and are less likely to be able to help both practically and financially (Ha et al. 2006). When this parent is in need of assistance (i.e., poor health), the children, rather than the spouse, becomes the primary caretaker (Pezzin and Shone 1999; Silverstein, Parrott, and Bengtson 1995; Utz et al. 2004). Remarried parents may gain responsibilities towards step-kin, and parent-child relationships may diminish after divorce (Eggebeen 1992a; Furstenberg et al. 1995; Stewart 2010).

Differences in the intergenerational family structure that coincide with existing socioeconomic inequalities exacerbate disadvantage across generations. Strong safety nets allow individuals greater security to pursue riskier endeavors that have greater future payoffs and help them to mitigate the impact of adverse events (Seltzer and Bianchi 2013). These “hidden safety nets and scaffoldings” (Swartz 2008; Swartz et al. 2011) that parents provide to adult children contribute to the reproduction and reinforcement of social class across generations. Cumulative advantages (or disadvantages) of material, cultural, human, and social capital that parents endow on their children (Bourdieu 1984; Lareau 2011; McLanahan 2004) continue into adulthood and contribute to greater differential socioeconomic attainment (Swartz 2009). Existing research consistently demonstrate adults whose parents live together receive greater benefit from a stronger “latent kin network of support” (Lawton et al. 1994; Riley and Riley 1993). Divergent demographic trends in single parenthood and life expectancy since in the

1980s have differentially affected lower and higher socioeconomic status (SES) adults. The following section briefly reviews the relevant trends.

Non-marital childbearing and divorce have led to more people with parents who do not live together (Pew Research Center 2013). From 1960 to 1990, the proportion of children living in single-parent household grew almost three-fold from 9 percent to 25 percent (US Census Bureau 2016). The disparity in single-parent families between children of parents with more and less education grew from 10 percentage points in the 1960s to 36 percentage points in the 2000s (McLanahan 2004).

Not only are parents with less education less likely to remain married, but they are also less likely to survive. While life expectancy in the United States has improved dramatically since the mid-Twentieth Century (Wilmoth 2000), these improvements were greater among people with college degrees (Elo 2009; Kitagawa and Hauser 1973; Lauderdale 2001; Lleras-Muney 2005). Increases in life expectancy among people with less education have slowed, especially men with less education and chances of premature death is considerably higher than those with more education (Sasson 2016).

Growing single-parenthood and lagging gains in life expectancy among lower SES families suggest that adult children of these families are less likely to have two parents providing a support network together due to separation or death. Strong intergenerational association of educational attainment (Solon 1999) suggest that demographic disparities persist across generations; the strength of the parental safety net would also be related to

the adult child's educational attainment. Quantifying the effect of each demographic trend is the main analytical aim of this article. Specifically, the article will address the following questions.

1. How many years are adults expected to have parents who are both alive and partnered with each other?
2. What is the disparity in parental safety nets between education groups in 1988 and 2013?
3. Which demographic process—life expectancy or union stability—is driving the growing disparity in the parental safety net?

Adults aged 25 to 49 in 2013 were born to parents who were more likely to be single, to have divorced, and to have greater life expectancies than their 1988 counterparts (McLanahan 2004; Wilmoth 2000). The recent cohort also had greater educational differences in marriage, non-marital childbearing, and mortality (Martin 2006; Sasson 2016). The analysis here conducts a careful comparison of these two cohorts using large intergenerational panel data. It shows that while adult respondents are more likely to have surviving parents in 2013 compared to 25 years ago for both college graduates and non-graduates, the proportion of respondents with divorced or never-married parents has increased disproportionately among non-college graduates. The analysis also notes that lagging improvements in fathers' mortality among respondents with less education have contributed to the growing difference. As expected, mothers and fathers of adults in 2013 were slightly younger than parents of adults in 1988.

Data and Measures

The Panel Survey of Income Dynamics (PSID) is a longitudinal survey that has followed respondents and descendants of a nationally representative sample of 5,000 households in 1968. The PSID follows original sample members (those who were in a PSID household in 1968) and their descendants, who are said to have the PSID "gene," as they move and form new households. Interviews were conducted every year from 1968 to 1997 and every two years after that. The PSID also interviews new members who join PSID households (for example, a new spouse) but the survey does not back-track their family histories and does not follow them if they move away. A special Rosters and Transfer module conducted in 1988 and 2013 collected basic demographic information on all respondents' parents regardless of their PSID gene status.

This article compares two cohorts of respondents who appear in the two Rosters and Transfers modules conducted 25 years apart. The earlier cohort was born between 1939 and 1963 and was aged 25-49 in 1988. The later cohort was born between 1964 and 1988 and was aged 25-49 in 2013. The analyses limit the age range of adults to 25 to 49 for both theoretical and analytical reasons. A large proportion of the population does not reach their lifetime level of educational attainment before age 25 (Fraumeni 2015) and the receipt of help from parents drops at older ages especially after age 50 (Cooney 1992). Adults are more likely to receive time and money transfers from their parents as they settle into their careers, purchase

houses, and raise young children (Seltzer and Bianchi 2013). Furthermore, intergenerational transfers are more likely to flow downwards while the adult child is relatively young whereas transfers may start flowing upwards as parents near the end of life (Choi 2003; Seltzer et al. 2012; Swartz 2009). Lastly, the analyses compare two cohorts that are 25 years apart (1988 and 2013); limiting the age interval to 25 years ensures that the two cohorts are discrete groups.

A limitation of the PSID is that it is likely represents a population that is more advantaged than the general US population. Adults and parents who have the PSID gene are descendants from families who were living in the United States in 1968. Respondents without the PSID gene are married to or cohabitate with a PSID-gene sample member. By construct, this sampling excludes any persons who immigrated to the United States after 1968 and did not live with a descendant of the PSID. Immigrants who entered the US after 1968 were largely without college degrees (Hugo Lopez, Passel, and Rohal 2015). Also, when the PSID reduced its sample size in 1997, the majority of cuts were taken from the Survey of Economic Opportunities, a component that had over-sampled low-income families in 1968 (Mcgonagle and Schoeni 2006). Thus, the PSID sample is likely to have a greater proportion of white Americans. African Americans and Latino/as who are much more likely to be born to unmarried mothers (Martinez, Daniels, and Chandra 2012) may be underrepresented in the sample. The magnitude of

the inequalities presented in the results is likely smaller than the true inequality of the US population.

The final analysis sample comprises 7,246 adults in the 1988 cohort and 7,014 adults in the 2013 cohort. All analyses incorporate weights that account for initial sampling probabilities and survey retention.

Educational Attainment

This study uses respondents' educational attainment, specifically whether they attained a 4-year college degree, to differentiate lower and upper socioeconomic groups. Education is often used as a proxy for socioeconomic status (SES) as it is strongly associated with family income, wealth, and social capital (Hout 2012). Unlike measures of income and wealth, education generally remains stable after age 25 (Fraumeni 2015) and is considered to be indicative of fundamental skill that has the potential to be translated into other forms of capital. This article opted to use the respondents' educational attainment over the parents' educational attainment for two reasons. First, the PSID does not include parents' education from all respondents. While it is possible to track down the parents of respondents who were born into the PSID, educational information is not available for parents of respondents who joined the PSID later in life. Secondly, and more importantly, this article is interested in studying the compounding inequities of SES and parental support network from the respondents' points of view. Using the education of parents, many of whom had already died before the survey or had different

SES from their children, would convolute these cross-sectional portraits of inequality.

The analyses use having a college degree to categorize respondents into lower and higher SES groups for both 1988 and 2013. Using a college degree as the cutoff leads to a conservative estimate of the increase in disparity between the two periods; college graduates in 1988 were more selective and had a greater relative advantage than college graduates in 2013(Ryan and Bauman 2016). Using alternative measures of education to examine changes in inequality between 1988 and 2013 did not substantially change the results. Separate sensitivity analyses of women (who experienced far greater changes in college attendance than men) yielded similar results when relative education (top half versus bottom half) and college versus high school graduates (without those who fall in between) separated lower and higher SES groups.

Parents' Survival Status

The Rosters and Transfers module contained good information on whether respondents' parents were alive at the time of the survey. Almost all adults in both 1988 and 2013 knew their mothers' survival statuses. About 1.5 percent of respondents had missing information on their fathers' survival statuses in both time periods. The Rosters and Transfers module did not ask respondents how old their parents were when they died. Furthermore, the 2013 module did not ask birth or death year of parents who were not alive at the time of the survey. Thus directly calculating mortality rates from the data

is impossible. I used indirect techniques to estimate the mortality schedules of mothers and fathers in 1988 and 2013.

Parents' Ages at Birth of Respondent

Parents' ages when they bear children affects the number of years that they would be able to support their offspring as they become adults. The adult children examined in this article were born between 1939 and 1988. During this period, the average total number of children a woman would bear in her lifetime (TFR) fluctuated from a little over two children in the 1940s to over 3.5 during the 1950s and back to two children in the 1980s (Population Reference Bureau 2014). On average, mothers of the earlier cohort (born between 1939 and 1963) had more children than mothers of the later cohort (born between 1964 and 1988). Consequently, while the average age at first birth increased (Kirmeyer and Hamilton 2011), the average age of overall childbirth decreased. People born in the 1980s had on average younger mothers than people born in the 1930s; mothers of the more recent cohort completed their lifetime fertility sooner. Also, women married men who were closer to them in age in recent decades (US Census Bureau 2012) resulting in adults having younger fathers as well as younger mothers. Age at childbirth has increased even more in very recent years, particularly among women with more education (Mathews and Hamilton 2016). However, this trend emerged among mothers who are too young to be included in this study.

I derived parents' ages when the respondent was born from the respondent's birth year and the parents' ages or birth years. The PSID collects more information on parents of respondents with a PSID "gene" than on parents of respondents who moved into a PSID household. The 1988 Rosters and Transfers module filled this gap by asking basic demographic information on all respondents' parents. About 5 percent of women and 10 percent of men did not know their mothers' ages or their mothers' years of birth. Birth data was available for some of these mothers who appeared elsewhere in the PSID. I dropped the ages of mothers who were less than 15 years or more than 50 years older than the respondents. In sum, about 12 percent of the 1988 cohort had missing mothers' ages at birth. About 26 percent of adults in 1988 had missing fathers' ages at the time of their births.

The 2013 Rosters and Transfers module only asked parents' birth years if they were alive at the time of the survey. Parents in 2013 were more likely to be alive and were more likely to have been interviewed as a PSID respondent at some point since 1968. Less than 10 percent of respondents had missing mothers' ages at the respondents' births, and less than 20 percent of respondents had missing fathers' ages at birth.

Parents' Union Status

Surviving mothers are categorized into two groups: still partnered with the respondent's father and not partnered with the respondent's father. The PSID's Rosters and Transfer module asked about parents' current living

arrangements rather than legal marital status or histories. Strictly, the analyses distinguished parents who are in a domestic partnership from parents who are not in a partnership. However, more than 92 percent of PSID-gened respondents in 1988 and more than 82 percent in 2013 reported that their parent was legally married at the time of their births. Mothers currently living alone at the time of survey may have divorced, never married, or never lived with the respondent's father. This article uses the term, 'union dissolution' to encompass dissolution of marriage, cohabitation, and romantic relationships. Also, the survey questions cannot differentiate whether the death of the father or union dissolution caused the mother to live separately in the first place. I use indirect methods (described below) to estimate mothers' rates of widowhood and union dissolution separately.

Analytic Strategy

The analysis examines the disparities in the number of years with partnered parents among college graduates and non-graduates. It quantifies the disparity in 1988 and again in 2013 and decomposes the demographic processes that contribute to the change between these two time periods. I constructed separate multiple decrement life tables to describe the number of expected years an adult spends with partnered parents for each cohort and education group. I then decomposed the between-group disparities into differences in mothers' mortality, fathers' mortality, and union dissolution. The analysis employed indirect techniques to estimate age-specific mortality and dissolution schedules from PSID's incomplete data. This section first

describes the multiple decrement life table and the decomposition procedure. Then it describes the indirect methodology to populate the life table.

Multiple Decrement Life Tables: Disparity in Expected Years with Partnered Parents and its Decomposition

The proportion of adults aged 25 to 49 with parents who are together can be represented as a function of the following demographic factors: the age distribution of respondents, $c_{ij}(x)$, the probability of the mother surviving the forces of mortality and union dissolution between the birth of the respondent and the date of the survey, $e^{-\int_{m_{ij}}^{m_{ij}+x} \mu_{mij}(y)+\mu_{dij}(y)dy}$, and the probability of the father surviving the forces of mortality, $e^{-\int_{f_{ij}}^{f_{ij}+x} \mu_{wij}(z)dz}$. The full life table equation is presented below in Equation 1.

Equation 1.

$$P_{25¿49¿_{ij}} = \sum_{x=25}^{49} c_{ij}(x) * e^{-\int_{m_{ij}}^{m_{ij}+x} \mu_{mij}(y)+\mu_{dij}(y)dy} * e^{-\int_{f_{ij}}^{f_{ij}+x} \mu_{wij}(z)dz}$$

where i = 1988, 2013 and j = 0,1 indicating college education of respondent

x = age of respondent

m= age of mothers at respondent's birth for respondents aged, x

f = age of fathers at respondent's birth for respondents aged, x

$c(x)$ = proportion of respondents aged x

$\mu_m(y)$ = mortality hazard of mothers aged y

$\mu_d(y)$ = hazard of union dissolution of mothers aged y

$\mu_w(z)$ = mortality hazard of fathers aged z

The key factors of interest are mothers' mortality schedule μ_m, parents' union dissolution μ_d, and fathers' mortality schedule, μ_w. The underlying hazards are specific to parents' ages between the respondents' births (m and f) and ages at survey (m+x and f+x). The multi-state life table anchors the parents' union on the mother's age rather than the father. The reason for this approach is three-fold. First, the mother is often the surviving parent as generally women live longer (Case and Paxson 2005) and marry older men (US Census Bureau 2012). Second, mother-child relationships are stronger, and the father's relationship with his children often depends on his relationship with the mother (Seltzer and Bianchi 2013). Third, respondents in the data are more likely to know the status of their mothers' than of their fathers'.

Using these life tables, I calculated the expected number of years with two partnered parents between ages 25 and 49 for each education group within the 1998 and 2013 cohort. To further explore the factors contribute to disparities, I decomposed the life table into the three key factors: mother mortality, fathers' mortality, and union dissolution. The PSID does not contain data to calculate the rates of mortality and dissolution

directly. Thus, I used indirect estimation (described in the next section) to derive the rates needed to build the life tables.

Expected Years with Partnered Parents I simulated the number of years that a 25-year-old adult expected to have with partnered parents before reaching age 50. To make comparisons across groups, I standardized respondents' age distribution across cohorts and education groups. Since mortality between 25 and 49 is relatively low, I used a uniform distribution. The life tables begin at the respondent's age 25 with a radix that is proportional to the observed proportion of 25-year old respondents with partnered parents. This implies that 25 year-olds with single parents will contribute zero years with partnered parents throughout the life table.

Decomposition of Life Table I decomposed the SES-disparity in the proportions of respondents aged 25 to 49 into differences in rates of mothers' mortality, father's mortality, and union dissolution. Equation 2 below takes the logged ratio of proportions to describe the overall SES disparity as the sum of the cause-specific differences for respondents aged x, in year i. A detailed derivation is the Appendix. The first term,

$$\left(\int_{m_{i1}}^{m_{i1}+x} \mu_{mi1}(y)dy - \int_{m_{i0}}^{m_{i0}+x} \mu_{mi0}(y)dy \right)$$ represents the difference in mothers' mortality cumulated across the x years between the respondents' birth and time in the survey. The second term represents differences in union dissolution, and the third represents differences in fathers' mortality.

Equation 2.

$$\ln\left(\frac{P_{xi0}}{P_{xi1}}\right)=\left(\int_{m_{i1}}^{m_{i1}+x}\mu_{mi1}(y)dy-\int_{m_{i0}}^{m_{i0}+x}\mu_{mi0}(y)dy\right)+\left(\int_{m_{i1}}^{m_{i1}+x}\mu_{di1}(y)dy-\int_{m_{i0}}^{m_{i0}+x}\mu_{di0}(y)dy\right)+\left(\int_{f_{i1}}^{f_{i1}+x}\mu_{wi1}(z)dz-\int_{f_{i0}}^{f_{i0}+x}\mu$$

$$,where\, i=1988,2013\, for\, each\, x\, between\, 25\wedge 49.$$

The data cannot directly observe individual μ's at each mother's or father's age. Only the cumulative hazard can be observed $\acute{\mu}_{xmij}=\int_{m_{ij}}^{m_{ij}+x}\mu_{mij}(y)dy$ for each cohort-education-respondent age group and the corresponding instantaneous hazard $\hat{\mu}_{mijx}$ is derived under the assumption of constant hazard across x years of exposure.

Equation 3.

$$\sum_{x=25}^{49}c_{ij}(x)*\ln\left(\frac{P_{xi0}}{P_{xi1}}\right)=\sum_{x=25}^{49}c_{ij}(x)*\left(\acute{\mu}_{xmi1}-\acute{\mu}_{xmi0}\right)+\sum_{x=25}^{49}c_{ij}(x)*\left(\acute{\mu}_{xdi1}-\acute{\mu}_{xdi0}\right)+\sum_{x=25}^{49}c_{ij}(x)*\left(\acute{\mu}_{xfi1}-\acute{\mu}_{xfi0}\right)$$

The respondents' age distribution, $c_{ij}(x)$ is simplified to a uniform distribution as the mortality of respondents in this age group was very low. Sensitivity checks using the 1990 and 2010 life tables for the same age group did not yield substantively different results. And thus, the overall disparities across ages 25 to 49 are the averages of respondent-age-specific disparities.

Indirect Measurements of Life Table Rates

The respondent's ages and the ages of their parents when she was born are directly from the data. I use indirect techniques to estimate mothers' mortality schedules, their hazards of widowhood, and their hazards of union dissolution.

Indirect estimation of parents' mortality I adapted the Brass's method of estimating adult survivorship probabilities from information on orphanhood (Brass and Bamgboye 1981; Brass and Hill 1973) to model mortality curves of mothers and fathers of respondents by cohort and education group. The Orphanhood method is particularly well-suited for data with good information on the age of the respondent and whether their parents are still alive—the two most complete variables in the Rosters and Transfers module. This method estimates parents' probabilities of surviving from age at the respondent's birth to the respondent's current age using the proportions of orphaned respondents at each age. Brass's method applies weighting factors simulated from the mean age of mothers (or fathers) at the birth of respondent and the age of the respondent to standardize survival probabilities from age 25.

Brass's Orphanhood method makes a few important and potentially consequential assumptions. First, the Brass method could overrepresent parents with more surviving children compared to parents with no or fewer surviving children. The method may produce biased results if the mortality rates of parents differ by the number of surviving children. For instance,

mortality among parents with fewer children may be higher due to death during childbearing years, health conditions that affect fertility and longevity, or common genetic or environmental factors that affect the survival of both parents and children. These potential biases are more pronounced when the Brass method is used to estimate overall population mortality. Parents with no surviving children are inconsequential to this analysis (as it examines disparities from the adult child's perspective) and the relatively low mortality conditions of the PSID are likely to result in small biases due to sibship size (Palloni, Massagli, and Marcotte 1984). Second, the Brass method estimates a single life-table for each cohort and education group from deaths that occurred throughout some period by creating a relational model from a standard. The resulting life-table reflects the mortality conditions of past years rather than the mortality conditions at the time of the survey. Changing mortality conditions are also less consequential in this article's use of the Brass method; this analysis is interested in capturing differences in the cumulative mortality conditions—changing or not—of the parents themselves.

The Rosters and Transfers modules' skip patterns caused deceased mothers (fathers) to be more likely to have missing birth data. Available data also showed that deceased parents were more likely to be older at the time of the respondent's birth. I calculated the mean age of maternity (paternity) by the mother's (father's) current survival status and derived the weighted

average to estimate the mean age at maternity (paternity) for each cohort and education group.

The Brass method yielded survival probabilities from age 25 to ages 55, 60, 65, and 70 for mothers and fathers of respondents in each cohort and education group. I used these mortality levels to simulate a complete survival curve from age 25 to 100 as a relational model of standard lifetables (Brass 1971). For the 1988 cohort, I used the 1990 US female and male life tables for maternal and paternal survival curves respectively. For the 2013 cohort, I used the 2010 US female and male life tables. Using alternative life tables (from different periods or race-specific groups) did not significantly alter the results.

A small proportion of respondents in both the 1988 and 2013 cohorts (approximately 1.5 percent in both) did not know the survival status of their father. These respondents' missing answers were dropped from the estimation of fathers' mortality curves. However, the respondents themselves are included in the overall analysis as they know the statuses of their mothers. The mortality curves of fathers whose survival status is unknown are assumed to be equal to the mortality curves of fathers whose survival status is known.

I compared the actual proportion of respondents with surviving mothers (fathers) by the respondent's age against the proportions derived from simulated lifetables. The simulated data is smoother than the observed data, but the overall differences between the two are very small (about 1%).

Indirect estimation of mothers' rates of widowhood and union dissolution The Rosters and Transfers module does not record parents' marital histories; it does, however, ask respondents whether the respondent's parents are currently still together. The data do not allow analysts to distinguish whether death or dissolution ended the union between the mother and the father (assuming that they were together at the time of conception).

I model a multiple decrement lifetable to derive the probabilities of a union ending in divorce or separation that will yield observed proportions of parents still together using mothers' and fathers' mortalities as competing factors. This approach essentially simulates the proportion of adults whose mothers are living with fathers from mortality alone. It then takes the difference between simulated and observed proportions and attributes excess to union dissolution. Mortality takes privilege over union dissolution among mothers who had died before the survey and could potentially underestimate their rates of union dissolution. The proportion respondents with deceased mothers did not change much between 1988 and 2013 (14.6 to 13.1 percent) and the inequality between education groups remained relatively similar (3.6 percentage points in 1988 and 4.2 percentage points in 2013). If the rates of union dissolution are similar between surviving and deceased mothers for each group, then this indirect approach would slightly underestimate the increase in inequality due to union dissolution.

Results

Descriptive Results

Table 1 shows the descriptive characteristics of respondents aged 25 to 49 in 1988 and 2013. Each cohort comprises over 7,000 adults. The age distribution of the 1988 cohort favors the younger age groups whereas the distribution of respondents is more evenly spread out between 25 and 49 in the 2013 cohort. These age distributions reflect the general aging of the US population between the two time periods. The median age of the 1988 and 2013 cohorts are similar however at 34 and 35 respectively. Educational attainment increased substantially between 1988 and 2013. The median person aged 25 to 49 in 1988 was a high school graduate; about a quarter received a college degree. In 2013, over 40 percent of respondents aged 25 to 49 received a college degree[1].

Increases in life expectancy led to more respondents in 2013 with surviving mothers. About 13 percent of respondents in 2013 had mothers who died before the survey compared to almost 15 percent in 1988. In 1988, almost half of the mothers were still living with the respondent's fathers. In 2013, the reverse was true; more mothers were not together with the respondent's father at the time of the survey due to fathers' mortality and union dissolution. The remainder of the results section will unpack these observed differences into recent demographic trends.

Table 2 compares the survival and union status of mothers between education groups. College graduates are more likely to have mothers who

[1] Respondents in the PSID are slightly more advantaged than the general US population.

are still together with fathers in both 1988 and 2013. However, the disparity was significantly greater in 2013. In 1988, about 55 percent of college graduates had mothers who were living with their fathers compared to about 46 percent of non-graduates—a difference of about nine percentage points. In 2013, this disparity in the proportion of respondents with parents who were still together was greater than 22 percentage points. The disparity in the proportion of respondents with single mothers more than tripled from 5.6 to 18.1 percentage points between 1988 and 2013. In 2013, over 53 percent of non-college graduates had single mothers. Disparities in the proportion of respondents with deceased mothers also increased between 1988 and 2013 from 3.6 percentage points to 4.2 percentage points. This increase is due to changes in mortality differences as well as changes in the age of the mother when she gave birth to the respondent. Mothers of adults in 2013 were about a year younger than mothers of adults in 1988 likely reflecting overall lower total fertility rates. Fathers were older than mothers by almost three years in 1988 and about 2.5 years in 2013. Differences between education groups were small.

Simulation Results

This section presents the results from the multiple decrement life table and its components. Figure 1 shows the proportion of adults with parents who are still living together by based on cohort and educational attainment based on life table calculations. Table 3 summarizes the disparities between groups with the expected number of years that an adult would spend with two

parents who are alive and living together when the adult child is between ages 25 and 49. College graduates in both the 1988 and 2013 cohorts spent over 13 out of the 25 years with two parents who are living with each other. In 1988, non-college graduates were expected to spend about 11.5 out of 25 years with two parents living together. In 2013, non-college graduates were expected to spend fewer years (6.3 years) co-surviving with two parents who are still together. The disparity between college graduates and non-graduates grew from 1.8 years in 1988 to 6.8 years in 2013.

Figure 2 shows the distribution of adults who enter adulthood with parents who do not live together, who experience parents' divorce or death sometime between ages 25 and 49, and those who live all 25 years with parents who are both alive and together. The most striking change between 1988 and 2013 is the proportion of non-college graduates who live the entirety of their adulthood without the benefit of having two parents who live together. In 2013, almost two-thirds of non-college graduates had never-married, divorced, widowed, or no surviving parents by the time they reach age 25. Only 18 percent of adults have parents who live together until age 50. For college graduates, about 44 percent have parents who are both alive and living together when they reach age 50. Only about a third of college graduates enter adulthood with never-married, divorced, widowed, or no surviving parents. This proportion has not changed significantly since 1988.

These differences in expected years with parents who are both alive and living together result from disparate age-specific patterns of parents'

mortalities and union dissolution. Appendix 1 shows the survival curves of mothers and fathers by the respondent's education and cohort. These survival curves are Brass-logit transformations of US survival probabilities for men and women in 1990 and 2010 fitted to mortality levels estimated from adults' reports of maternal and paternal survival (Brass 1971).

Mothers and fathers of both education groups are living longer in 2013 than in 1988. Improvements in life expectancy were greater among parents of college graduates. Fathers of non-college graduates experienced the smallest gains in life expectancy. The disparity between fathers of college graduates and non-graduates in 2013 is greater than it was in 1988.

Figure 3 compares the hazards of mortality and union dissolution that result in reduced parental safety nets for respondents between education groups and cohorts. These values standardize the age-distribution of respondents but not for the parents. Therefore, these values are affected by the age of the parents at the respondent's birth.

In 1988, fathers' mortality posed the greatest hazard for both college graduates and non-graduates; respondents were more likely to experience the death of a father than the dissolution of their parents' marriages or unions. These hazards presented in Figure 3 translate to 12 percent of non-college graduates and 10 percent of college graduates experiencing the death of a father within ten years. Under constant hazards, about 7 percent of non-college graduates and 6 percent of college graduates would experience the dissolution of their parents' unions within the same period. In

2013, parents of respondents in both education groups were more likely to divorce or separate before the death of one parent. The hazard of union dissolution among parents of non-college graduates is notably high at 0.020. This hazard equates to about 18 percent of non-college graduates experiencing parental divorce or separation within ten years. In comparison, only 9 percent of college graduates in 2013 would experience the same within ten years.

Parents of non-college graduates are more than twice as likely as parents of college graduates not to be living together. Fathers' mortality hazards dropped for both education groups between 1988 and 2013. However, the drop was greater among college graduates. Under constant hazards, about 8 percent of non-college graduates would experience the death of a father within ten years whereas only about 4 percent of college graduates would experience a paternal death during the same period.

Decomposition Results

Figure 4 decomposes the disparity in the proportion of respondents with parents who are still living together. The disparity is represented as the logged ratio of the proportion of college graduates to the proportion of non-graduates with parents who were together at the time of the survey. The total disparity is the sum of differences in the hazards of mothers' mortality, fathers' mortality, and parents' union dissolution. The percentages in Figure 4 represent the contribution of each factor to the disparity within each

cohort. This decomposition is standardized for age distributions of the respondents.

The most notable change between 1988 and 2013 is the increase in overall disparity between education groups. The logged ratio more than tripled from 0.16 to 0.52. Parents' deaths accounted for almost all (97%) of the disparity in 1988. Parents of non-college graduate adults in 1988 died sooner than parents of college graduates, and this was the primary cause of fewer non-graduates having both parents living together. The difference in fathers' mortalities was the greatest contributor to the educational disparity. About 62 percent of the disparity was due to greater fathers' mortalities among non-college graduates. About 34 percent of the disparity in 1988 was due to greater mothers' mortalities. The remaining 3 percent of the disparity between education groups was due to different rates of union dissolution of their parents.

Union dissolution among parents of non-college graduates was the predominant driver in the rise in inequality in 2013. Not only did the surge in union dissolution increase inequality overall, but it also surpassed the combined differences from mothers' and fathers' mortalities as the dominant cause of the educational disparity in having both parents who live together. The difference in parents' union dissolution accounted for 63 percent of the overall disparity. This significant jump overshadowed another notable rise in inequality; the difference in fathers' mortalities also grew and accounted for 30 percent of the disparity. Differences in mothers' mortalities, on the other

hand, shrank in 2013 and accounted for seven percent of the overall educational inequality.

Discussion

Compared to 1988, non-college graduates in 2013 are expected to spend fewer years during their early to mid-adulthood with a familial safety net provided by two surviving parents who are living together. This trend is driven by non-college graduates' parents' soaring union dissolution rate that almost tripled during this period. The 2013 cohort was born between 1964 and 1988 as the rates of divorce and non-marital childbearing were rapidly rising in the US. In comparison, the beginning of the Second Demographic Transition coincided with only the youngest of the 1988 cohort (born between 1939 and 1963). Increases in union dissolution overshadowed small improvements in parents' mortalities.

College graduates are expected to spend over half their early to mid-adulthood benefitting from safety nets provided by two married parents. While parents' union dissolution rate increased between 1988 and 2013, it was offset by improvements in parents', particularly fathers', mortality rates. The expected number of years to spend with two parents still together in 2013 has remained similar to levels in 1988 for college graduates. The disparity between education groups has increased substantially; growing differences in union dissolution and fathers' mortalities explain this divergence in safety-nets between respondents with already unequal resources.

The analyses' findings should be interpreted with some caution. First, this article focuses on intergenerational family structures via maternal ties. However, safety nets may be the thinnest for single men and fathers. The proportion of children who are living in households headed by single fathers is still small but growing. In 2011, about 2.6 million (8 percent of household with minor children) households had a single father (Pew Research Center 2013). Single-father households are over-represented by younger men with less education, who are African American and are living at or below the poverty line. These households may arguably have the thinnest safety nets. Additionally, the analyses here do not account for adults with fathers who outlived the mothers. About 7 percent of the 1988 cohort and 6 percent of the 2013 cohort have surviving fathers and deceased mothers. These proportions are roughly equal between education groups.

Second, non-marital childbearing is likely a major driving factor in creating an unequal safety net. However, the analyses here combine union dissolution from marriage with other forms of romantic relationships such as cohabitation. The results cannot precisely parse out increasing instability of marriage from increasing childbearing in less stable unions. Percentage of births to non-married mothers has increased dramatically since the 1960s. Among adults with the PSID gene (about 50 percent of the sample whose birth information is known), about 9 percent of non-college graduates and 4 percent of college graduates in the 1988 cohort were born to unmarried mothers. Over 25 percent of non-graduates in the 2013 cohort were born to

unmarried mothers compared to 6.6 percent of college graduates in the same cohort.

Despite these limitations, an examination of the PSID highlights the persistent and growing disadvantage that crosses generations. Children growing up in higher SES families are likely benefiting from the collective support of their parents and grandparents whereas children in lower SES families are likely to have mothers whose limited resources are spread across three generations. The risk of becoming what Weimers and Bianchi (2015) call the “Sandwich Generation” is heightened among respondents without a college degree. Adult children of lower SES families may start supporting a dying parent sooner (Guralnik et al. 1991) and a widowed parent after that (Lin 2008; Roan and Raley 1996; Soldo, Wolf, and Henretta 1999) placing a greater demand for care and support as their parents near the end of life while also raising young children.

The burden of care is greater on these people as their parents are likely to be single without a spouse to rely on. In contrast, college graduates in the same age group are likely benefitting from their parents’ health and resources as they raise their children. For college graduates’ parents, declines in disability may accompany increasing life spans (Crimmins and Saito 2001; Cutler 2001; Martin, Schoeni, and Andreski 2010; Molla, Madans, and Wagener 2004; Rogers, Hummer, and Nam 2000). They may live longer and healthier, allowing them to continue supporting their adult children for a greater period (Watkins et al. 1987). These grandchildren of well-off families

who benefit from the combined resources of their parents and grandparents start their lives with greater advantage. Continuing demographic trends in mortality, union dissolution, and non-marital childbearing predict that this advantage will further increase.

References

Aquilino, William S. 1997. “From Adolescent to Young Adult: A Prospective Study of Parent-Child Relations during the Transition to Adulthood.” *Journal of Marriage and Family* 59(3):670–86.

Aquilino, William S. 2005. “Impact of Family Structure on Parental Attitudes Toward the Economic Support of Adult Children Over the Transition to Adulthood.” *Journal of Family Issues* 26(2):143–67.

Bengtson, Vern L. 2001. “Beyond the Nuclear Family: The Increasing Importance of Multigenerational Bonds.” *Journal of Marriage and Family* 63(1):1–16.

Bourdieu, P. 1984. *Distinction: A Social Critique of the Judgement of Taste*. Harvard University Press.

Brass, William. 1971. *Biologial Aspects of Demography*. edited by W. Brass. London: Taylor & Francis Group.

Brass, William. 1975. *Methods for Estimating Fertility and Mortality from Limited and Defective Data*. Chapel Hill, NC.

Brass, William and E. A. Bamgboye. 1981. *The Time Location of Reports of Survivorship: Estimates for Maternal and Paternal Orphanhood and the Ever-Widowed*. 81–1.

Brass, William and Kenneth T. Hill. 1973. “Estimating Adult Mortality from Orphanhood.” *Proceedings of the International Population Conference* 3:111–13.

Bureau, US Census. 2012. *Estimated Median Age at First Marriage, by Sex:*

1890 to the Present. Washington DC.

Case, Anne and Christina H. Paxson. 2005. “Sex Differences in Morbidity and Mortality.” *Demography* 42(2):189–214.

Center, Pew Research. 2013. *The Rise of Single Fathers: A Ninefold Increase Since 1960*. Washington DC.

Choi, Namkee G. 2003. “Coresidence between Unmarried Aging Parents and Their Adult Children: Who Moved in with Whom and Why?” *Research on Aging* 25(4):384–404.

Cooney, Teresa M. and Peter Uhlenberg. 1990. “The Role of Divorce in Men’s Relations with Their Adult Children after Mid-Life.” *Journal of Marriage and Family* 52(3):677–88.

Crimmins, Eileen M. and Yasuhiko Saito. 2001. “Trends in Healthy Life Expectancy in the United States, 1970–1990: Gender, Racial, and Educational Differences.” *Social Science & Medicine* 52(11):1629–41.

Curran, Sara R., Sara McLanahan, and Jean Knab. 2003. “Does Remarriage Expand Perceptions of Kinship Support among the Elderly?” *Social Science Research* 32(2):171–90.

Cutler, D. M. 2001. “Declining Disability Among The Elderly.” *Health Affairs* 20(6):11–27.

Eggebeen, D. J. 1992a. “Family Structure and Intergenerational Exchanges.” *Research on Aging* 14(4):427–47.

Eggebeen, D. J. 1992b. “Family Structure and Intergenerational Exchanges.” *Research on Aging* 14(4):427–47.

Eggebeen, D. J. and D. P. Hogan. 1990. “Giving between Generations in American Families.” *Human Nature (Hawthorne, N.Y.)* 1(3):211–32.

Eggebeen, David J. and Adam Davey. 1998. “Do Safety Nets Work? The Role of Anticipated Help in Times of Need.” *Journal of Marriage and Family* 60(4):939–50.

Elo, Irma T. 2009. “Social Class Differentials in Health and Mortality: Patterns and Explanations in Comparative Perspective.” *Annual Review of Sociology* 35(1):553–72.

Fraumeni, Barbara M. 2015. *Choosing a Human Capital Measure: Educational Attainment Gaps and Rankings*. 21283.

Furstenberg, Frank F., Saul D. Hoffman, and Laura Shrestha. 1995. “The Effect of Divorce on Intergenerational Transfers: New Evidence.” *Demography* 32(3):319.

Furstenberg, Frank F., R. Rumbaut, and R. A. Jr. Settersten. 2005. “On the Frontier of Adulthood: Emerging Themes and New Directions.” Pp. 3–25 in *On the Frontier of Adulthood: Theory, Research, and Public Policy*, edited by R. A. Settersten, F. F. Furstenberg, and R. Rumbaut. Chicago: University of Chicago Press.

Ganong, Lawrence and Marilyn Coleman. 1999. *Changing Families, Changing Responsibilities: Family Obligations Following Divorce and Remarriage*. Mahwah, NJ: Lawrence Erlbaum.

Goodman, Leo A., Nathan Keyfitz, and Thomas W. Pullum. 1974. “Family Formation and the Frequency of Various Kinship Relationships.”

Theoretical Population Biology 5(1):1–27.

Guralnik, J. M., A. Z. LaCroix, L. G. Branch, S. V Kasl, and R. B. Wallace. 1991. "Morbidity and Disability in Older Persons in the Years Prior to Death." *American Journal of Public Health* 81(4):443–47.

Ha, J. H., Deborah Carr, Rebecca L. Utz, and Randolph Nesse. 2006. "Older Adults' Perceptions of Intergenerational Support After Widowhood: How Do Men and Women Differ?" *Journal of Family Issues* 27(1):3–30.

Hagestad, G. O. 1996. "On-Time, off-Time, out of Time? Reflections on Continuity and Discontinuity from an Illness Process." Pp. 204–22 in *Adulthood and aging: Research on continuities and discontinuities*, edited by V. L. Bengtson. New York: Springer.

Hamilton, Laura T. (Laura Teresa). 2016. *Parenting to a Degree : How Family Matters for College Women's Success*.

Hogan, Dennis P., David J. Eggebeen, and Clifford C. Clogg. 1993. "The Structure of Intergenerational Exchanges in American Families." *American Journal of Sociology* 98(6):1428–58.

Hugo Lopez, Mark, Jeffrey Passel, and Molly Rohal. 2015. *Modern Immigration Wave Brings 59 Million to U.S., Driving Population Growth and Change Through 2065*. Washington, D.C.

Kaplan, Greg. 2012. "Moving Back Home: Insurance against Labor Market Risk." *Journal of Political Economy* 120(3):446–512.

Kirmeyer, Sharon and Brady Hamilton. 2011. *Transitions Between Childlessness and First Birth: Three Generations of U.S. Women*.

Kitagawa, E. M. and P. M. Hauser. 1973. *Differential Mortality in the United States: A Study in Socioeconomic Epidemiology*. Cambridge, MA: Harvard University Press.

Lareau, Annette. 2011. *Unequal Childhoods : Class, Race, and Family Life*. University of California Press.

Lauderdale, Diane S. 2001. “Education and Survival: Birth Cohort, Period, and Age Effects.” *Demography* 38(4):551–61.

Lawton, Leora, Merril Silverstein, and Vern Bengtson. 1994. “Affection, Social Contact, and Geographic Distance between Adult Children and Their Parents.” *Journal of Marriage and Family* 56(1):57–68.

Light, Audrey and Kathleen McGarry. 2004. “Why Parents Play Favorites: Explanations for Unequal Bequests.” *The American Economic Review* 94(5):1669–81.

Lin, I. Fen. 2008. “Consequences of Parental Divorce for Adult Children’s Support of Their Frail Parents.” *Journal of Marriage and Family* 70(1):113–28.

Lleras-Muney, Adriana. 2005. “The Relationship Between Education and Adult Mortality in the United States.” *Review of Economic Studies* 72(1):189–221.

Logan, J. and G. Spitze. 1996. *Family Ties: Enduring Relations between Parents and Their Grown Children*. Philadelphia, PA: Temple University Press.

Lopez Turley, R. N. and M. Desmond. 2011. “Contributions to College Costs

by Married, Divorced, and Remarried Parents." *Journal of Family Issues* 32(6):767–90.

Lye, Diane N. 1996. "Adult Child–Parent Relationships." *Annual Review of Sociology* 22(1):79–102.

Martin, Linda G., Robert F. Schoeni, and Patricia M. Andreski. 2010. "Trends in Health of Older Adults in the United States: Past, Present, Future." *Demography* 47(Supp):17–40.

Martin, Steven P. 2006. "Trends in Marital Dissolution by Women's Education in the United States." *Demographic Research* 15:537–60.

Martinez, Gladys, Kimberly Daniels, and Anjani Chandra. 2012. "Fertility of Men and Women Aged 15-44 Years in the United States: National Survey of Family Growth, 2006-2010." *National Health Statistics Reports* (51):1–28.

Mathews, T. J. and Brady E. Hamilton. 2016. "Mean Age of Mothers Is on the Rise: United States, 2000–2014 Key Findings Data from the National Vital Statistics System 2000-2014."

Mcgonagle, Katherine and Robert Schoeni. 2006. *The Panel Study of Income Dynamics: Overview and Summary of Scientific Contributions After Nearly 40 Years*.

McLanahan, Sara. 2004. "Diverging Destinies: How Children Are Faring Under the Second Demographic Transition." *Demography* 41(4):607–27.

Molla, Michael T., Jennifer H. Madans, and Diane K. Wagener. 2004. "Differentials in Adult Mortality and Activity Limitation by Years of

Education in the United States at the End of the 1990s." *Population and Development Review* 30(4):625–46.

Murphy, Michael. 2011. "Long-Term Effects of the Demographic Transition on Family and Kinship Networks in Britain." *Population and Development Review* 37:55–80.

Mutchler, J. E. and L. A. Baker. 2009. "The Implications of Grandparent Coresidence for Economic Hardship Among Children in Mother-Only Families." *Journal of Family Issues* 30(11):1576–97.

Palloni, A., M. Massagli, and J. Marcotte. 1984. "Estimating Adult Mortality with Maternal Orphanhood Data: Analysis of Sensitivity of the Techniques." *Population Studies* 38(2):255.

Pezzin, Liliana E., Robert A. Pollak, and Barbara Steinberg Schone. 2008. "Parental Marital Disruption, Family Type, and Transfers to Disabled Elderly Parents." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 63(6):S349–58.

Pezzin, Liliana E. and B. Shone. 1999. "Parental Marital Disruption and Intergenerational Transfers: An Analysis of Lone Elderly Parents and Their Children." *Demography* 36:287–97.

Population Reference Bureau. 2014. *The Decline in U.S. Fertility*.

Riley, M. W. and J. W. Riley. 1993. "Connections: Kin and Cohort." Pp. 169–89 in *The Changing Contract Across Generations*, edited by V. Bengtson and W. A. Achenbaum. New York: Aldine de Gruyter.

Roan, Carol L. and R. Kelly Raley. 1996. "Intergenerational Coresidence and

Contact: A Longitudinal Analysis of Adult Children's Response to Their Mother's Widowhood." *Journal of Marriage and Family* 58(3):708–17.

Rogers, R. G., R. A. Hummer, and C. B. Nam. 2000. *Living and Dying in the USA: Behavioral, Health, and Social Differentials of Adult Mortality*. New York: Academic Press.

Rossi, Alice S. and Peter H. Rossi. 1990. *Of Human Bonding: Parent-Child Relations Across the Life Course*. Transaction Publishers.

Ryan, Camille L. and Kurt Bauman. 2016. "Educational Attainment in the United States: 2015 Population Characteristics Current Population Reports."

Ryff, C. D., P. S. Schmutte, and Y. H. Lee. 1996. "How Children Turn out: Implications for Parental Self-Evaluation." Pp. 853–66 in *The Parental Experience at Midlife*, edited by C. D. Ryff and M. M. Seltzer. Chicago: University of Chicago Press.

Sasson, Isaac. 2016. "Trends in Life Expectancy and Lifespan Variation by Educational Attainment: United States, 1990-2010." *Demography* 53(2):269–93.

Seltzer, Judith A. and Suzanne M. Bianchi. 2013. "Demographic Change and Parent-Child Relationships in Adulthood." *Annual Review of Sociology* 39:275–90.

Seltzer, Judith A., Charles Q. Lau, and Suzanne M. Bianchi. 2012. "Doubling up When Times Are Tough: A Study of Obligations to Share a Home in Response to Economic Hardship." *Social Science Research* 41(5):1307–

19.

Shanahan, Michael J. 2000. “Pathways to Adulthood in Changing Societies: Variability and Mechanisms in Life Course Perspective.” *Annual Review of Sociology* 26(1):667–92.

Silverstein, M. 2006. “Intergenerational Support to Aging Parents: The Role of Norms and Needs.” *Journal of Family Issues* 27(8):1068–84.

Silverstein, M. and A. Marenco. 2001. “How Americans Enact the Grandparent Role Across the Family Life Course.” *Journal of Family Issues* 22(4):493–522.

Silverstein, Merril and Vern L. Bengtson. 1997. “Intergenerational Solidarity and the Structure of Adult Child-Parent Relationships in American Families 1.” *American Journal of Sociology* 103(2):429–60.

Silverstein, Merril, Tonya M. Parrott, and Vern L. Bengtson. 1995. “Factors That Predispose Middle-Aged Sons and Daughters to Provide Social Support to Older Parents.” *Journal of Marriage and Family* 57(2):465–75.

Soldo, Beth, Douglas A. Wolf, and John C. Henretta. 1999. “Intergenerational Tranfers: Blood, Marriage, and Gender Effects on Household Decisions.” Pp. 335–55 in *Wealth, Work, and Health: Innovations in Measurement in the Social Sciences*, edited by J. P. Smith and R. J. Willis. Ann Arbor, MI.

Solon, Gary. 1999. “Chapter 29 – Intergenerational Mobility in the Labor Market.” Pp. 1761–1800 in *Handbook of Labor Economics*. Vol. 3.

Song, Xi and Robert D. Mare. 2017. “Short-Term and Long-Term Educational Mobility of Families: A Two-Sex Approach.” *Demography* 54(1):145–73.

Stewart, Susan D. 2010. “Children With Nonresident Parents: Living Arrangements, Visitation, and Child Support.” *Journal of Marriage and Family* 72(5):1078–91.

Swartz, Teresa Toguchi. 2008. “Family Capital and the Invisible Transfer of Privilege: Intergenerational Support and Social Class in Early Adulthood.” *New Directions for Child and Adolescent Development* (119):11–24.

Swartz, Teresa Toguchi. 2009. “Intergenerational Family Relations in Adulthood: Patterns, Variations, and Implications in the Contemporary United States Key Words.”

Swartz, Teresa Toguchi, Minzee Kim, Mayumi Uno, Jeylan Mortimer, and Kirsten Bengtson O’Brien. 2011. “Safety Nets and Scaffolds: Parental Support in the Transition to Adulthood.” *Journal of Marriage and Family* 73(2):414–29.

Teresa M. Cooney, Peter Uhlenberg. 1992. “Support from Parents over the Life Course: The Adult Child’s Perspective.” *Social Forces* 71(1):63–84.

US Census Bureau. 2016. “Historical Living Arrangements of Children.” Retrieved May 8, 2017 (https://www.census.gov/data/tables/time-series/demo/families/children.html).

Utz, Rebecca L., Erin B. Reidy, Deborah Carr, Randolph Nesse, and Camille Wortman. 2004. “The Daily Consequences of Widowhood: The Role of Gender and Intergenerational Transfers on Subsequent Housework Performance.” *Journal of Family Issues* 25(5):683–712.

Wachter, K. W. 1997. “Kinship Resources for the Elderly.” *Philosophical*

Transactions of the Royal Society B: Biological Sciences 352(1363):1811–17.

Ward, R. A. and G. D. Spitze. 2007. “Nestleaving and Coresidence by Young Adult Children: The Role of Family Relations.” *Research on Aging* 29(3):257–77.

Watkins, Susan Cotts, Jane A. Menken, and John Bongaarts. 1987. “Demographic Foundations of Family Change.” *American Sociological Review* 52(3):346–58.

Wiemers, Emily E. and Suzanne M. Bianchi. 2015. “Competing Demands from Aging Parents and Adult Children in Two Cohorts of American Women.” *Population and Development Review* 41(1):127–46.

Wilmoth, J. R. 2000. “Demography of Longevity: Past, Present, and Future Trends.” *Experimental Gerontology* 35(9–10):1111–29.

TABLE 1 Descriptive characteristics of respondents aged 25-49, 1988 and 2013

	1988 Cohort	2013 Cohort
Median age	34	35
Female (%)	53.0	54.4
Education (%)		
Less than high school	11.5	4.8
High school graduate	38.3	25.8
Some college	23.5	27.5
College graduate	15.3	24.6
Postgraduate	11.4	17.3
Mothers' survival and union status		
Deceased	14.6	13.1
Living together with father[1]	48.2	41.6
Not together with father[2]	37.1	45.3
N	7,246	7,014

Notes
1 Must have been cohabiting for at least 12 months or since the last wave. 2 Combines widowed, divorced, separated, and never married mothers. Values are weighted using individual cross-sectional weights. Data Source: Panel Survey of Income Dynamics, Rosters and Transfers' File 1988, 2013

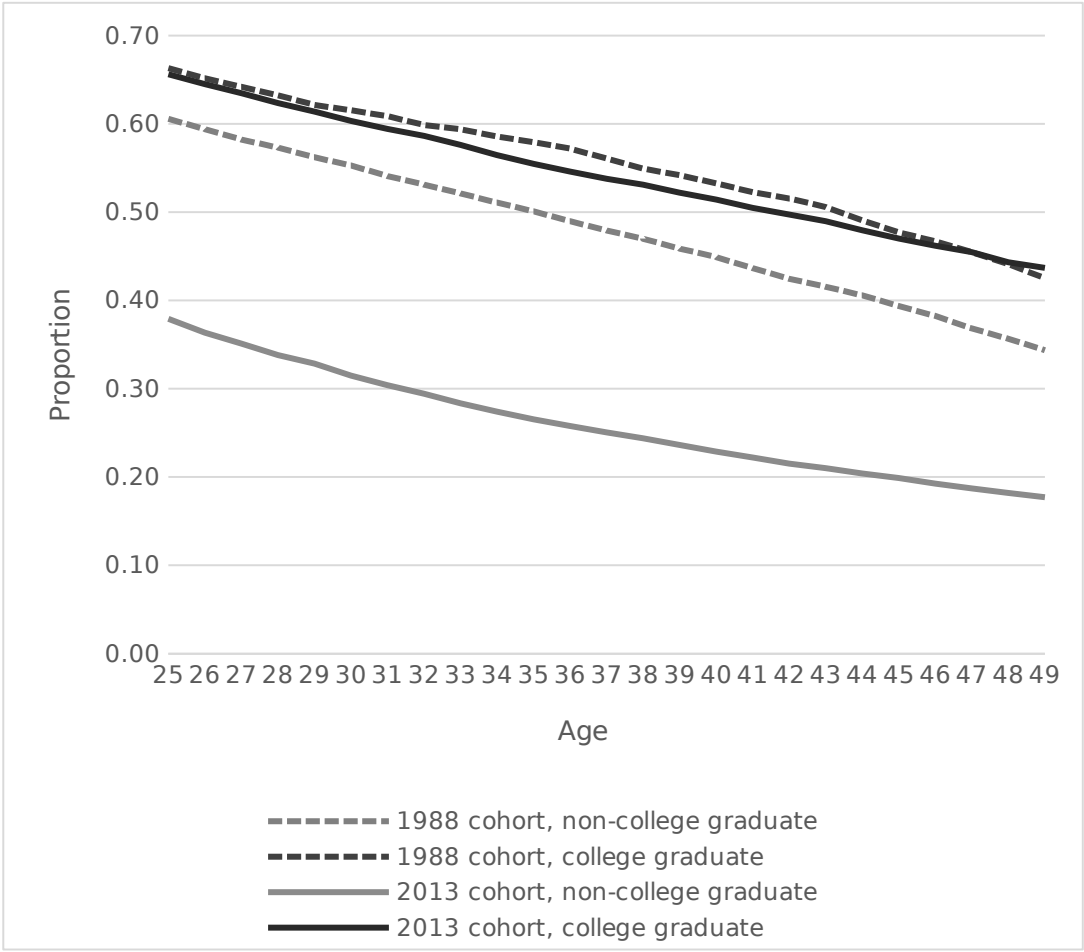
TABLE 2 Observed mothers' characteristics for adults aged 25-49 in 1988 and 2013 by educational attainment

	1988 (n = 7,246)			**2013 (n =** 7,014)		
	Non-college graduate	**College graduate**	**Difference**	**Non-college graduate**	**College graduate**	**Difference**
Status of respondents' mother (% of respondents)						
Respondents mother is living with respondents' father	45.7	54.9	9.2	31.8	54.0	22.2
Respondents' mother is not living with respondents' father (divorced, widowed, never married)	38.7	33.1	-5.6	53.3	35.2	-18.1
Respondent's mother is deceased	15.6	12.0	-3.6	14.9	10.8	-4.2
	100.0	100.0		100.0	100.0	
Average mother's age at birth of respondent	26.8	28.1	1.3	25.2	27.1	1.9
Average father's age at birth of respondent	29.7	30.9	1.2	27.7	29.4	1.7

Notes

Values are weighted using individual cross-sectional weights. [1] Refers to the father of the respondent. Data Source: Panel Survey of Income Dynamics, Rosters and Transfers' File 1988, 2013

FIGURE 1 Proportion with parents who are both alive and living with each other for adults between ages 25 and 49 by cohort and educational attainment based on life table calculations



Notes

Life tables are built in reference to the respondent's age and start at age 25 and end at age 49. Data Source: Panel Survey of Income Dynamics

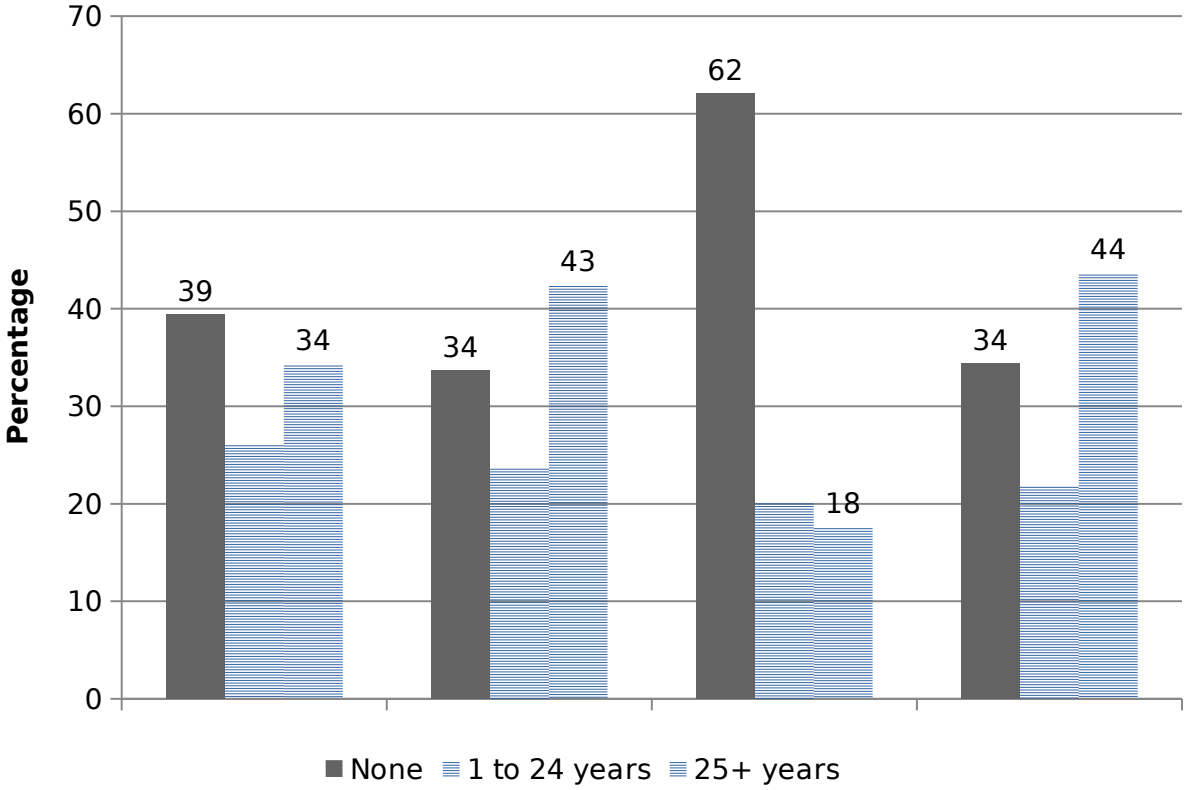
TABLE 3 Expected number of years with parents who are both alive and living with each other for adults between ages 25 and 49 by cohort and educational attainment

	1988 cohort	2013 cohort	Change
College graduate	13.4	13.1	-0.3
Non-college graduate	11.5	6.3	-5.3
Disparity	-1.8	-6.8	-5.0

Notes

Life tables are built in reference to the respondent's age and start at age 25 and end at age 49. Data Source: Panel Survey of Income Dynamics

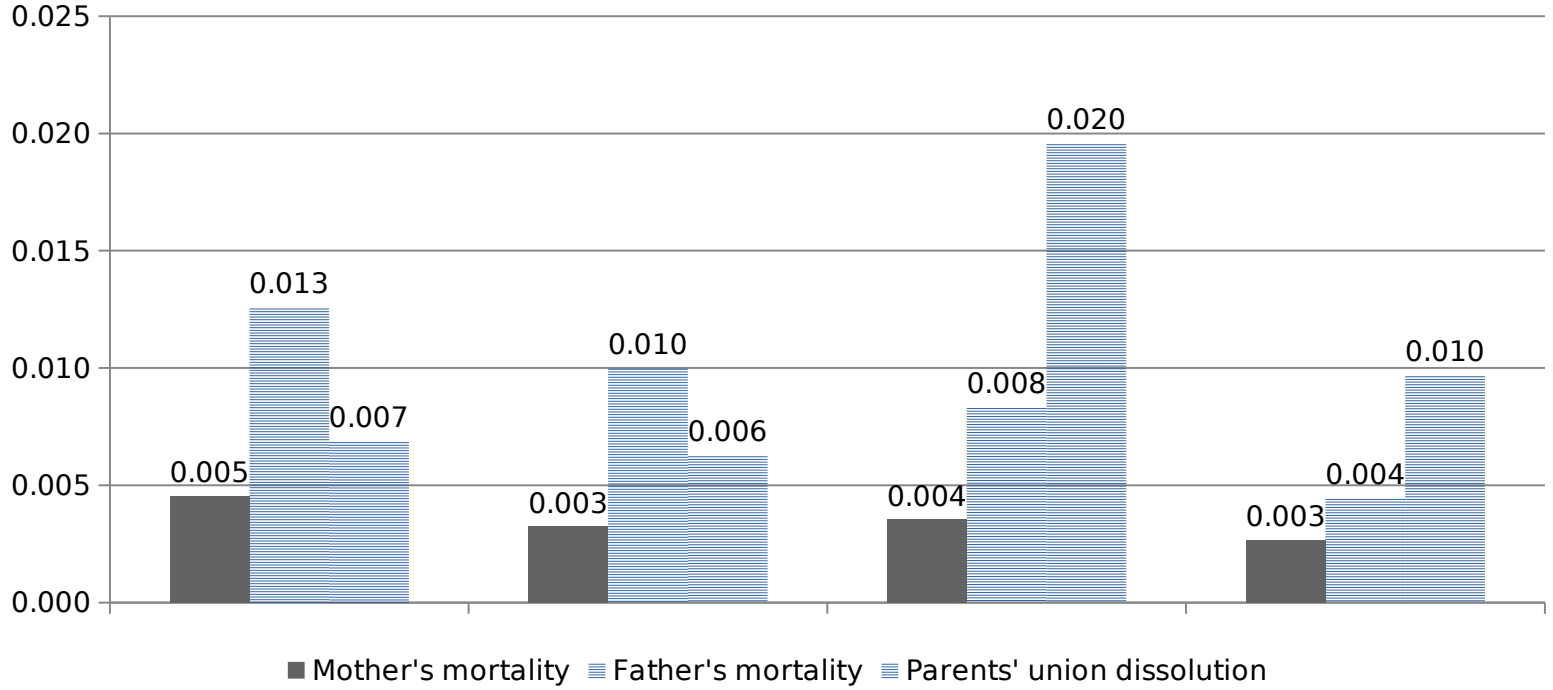
FIGURE 2 Distribution of adults across expected years with parents who are alive and together



Notes

Figures based on life table simulations in reference to the respondent's age and start at age 25 and end at age 49. Data source: Panel Survey of Income Dynamics

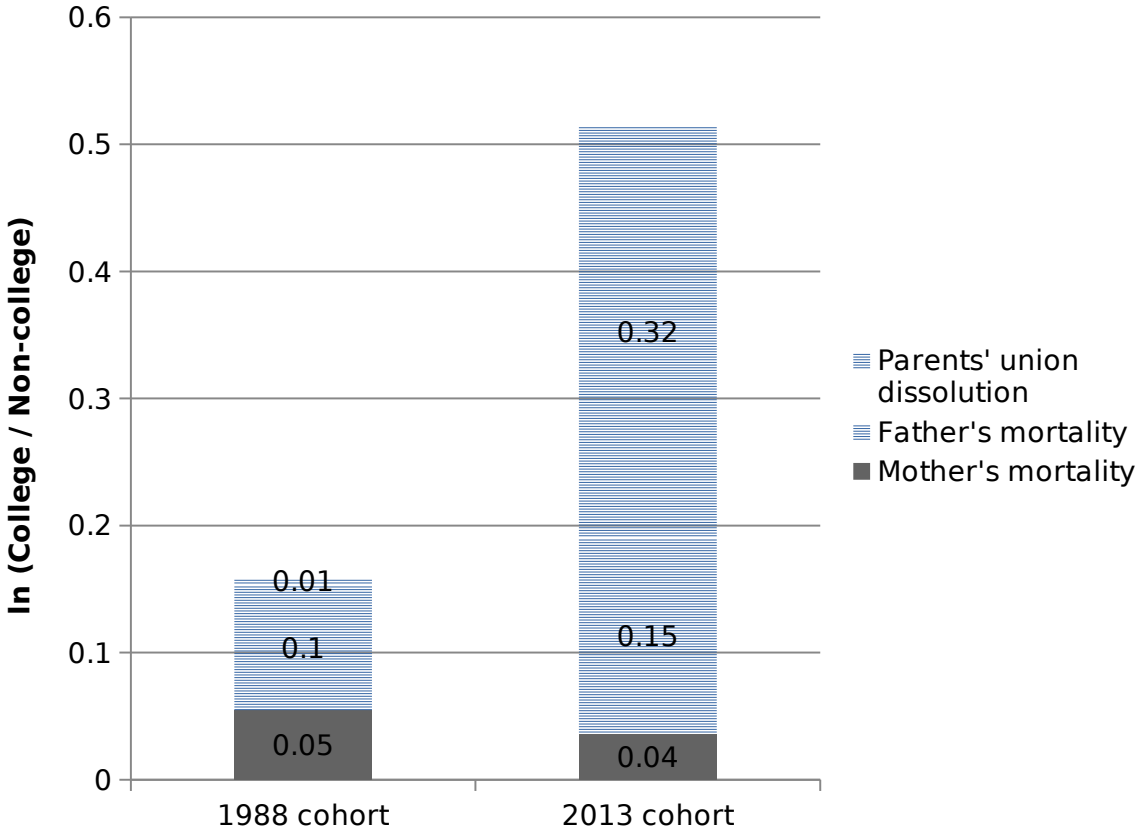
FIGURE 3 Hazards of mothers' mortality, fathers' mortality, and parents' union dissolution of adults aged 25-49 in 1988 and 2013



Notes

Hazards are calculated from Brass estimation of parents' mortalities and indirect estimation of union dissolution standardized for age-distribution of respondents. Age-distributions of respondents are standardized. Data source: Panel Survey of Income Dynamics

FIGURE 4 Decomposition of the increase in disparity in proportion of respondents with mothers living with the father between 1988 and 2013



Notes

Decomposition derived from Brass estimation of maternal and paternal mortality and indirect estimation of union dissolution standardized for the age-distribution of respondents. Data Source: Panel Survey of Income Dynamics

APPENDIX 1 Decomposition

Equation 1.

$$P_{25¿}49¿_{ij}=\sum_{x=25}^{49} c_{ij}(x)*e^{-\int_{m_{ij}}^{m_{ij}+x}\mu_{mij}(y)+\mu_{dij}(y)dy}*e^{-\int_{f_{ij}}^{f_{ij}+x}\mu_{wij}(z)dz}$$

where i = 1988, 2013 and j = 0,1 indicating college education of respondent

x = age of respondent

m= age of mothers at respondent's birth for respondents aged, x

f = age of fathers at respondent's birth for respondents aged, x

$c(x)$ = proportion of respondents aged x

$\mu_m(y)$ = mortality hazard of mothers aged y

$\mu_d(y)$ = hazard of union dissolution of mothers aged y

$\mu_w(z)$ = mortality hazard of fathers aged z

The distribution of respondents across age 25 to 49 is assumed to be uniform due to very low mortality in this age group. $c_{ij}(x)=1/25$

For a given respondent age, x in a given year, i where i = {1988, 2013} and 25 <= x <= 49,

$$\ln\left(\frac{P_{xi0}}{P_{xi1}}\right)=\ln\left(\frac{e^{-\int_{m_{i0}}^{m_{i0}+x}\mu_{mi0}(y)dy}*e^{-\int_{m_{i0}}^{m_{i0}+x}\mu_{di0}(y)dy}*e^{-\int_{f_{i0}}^{f_{i0}+x}\mu_{wi0}(z)dz}}{e^{-\int_{m_{i1}}^{m_{i1}+x}\mu_{mi1}(y)dy}*e^{-\int_{m_{i1}}^{m_{i1}+x}\mu_{di1}(y)dy}*e^{-\int_{f_{i1}}^{f_{i1}+x}\mu_{wi1}(z)dz}}\right)$$

$$¿\ln\left(e^{-\int_{m_{i0}}^{m_{i0}+x}\mu_{mi0}(y)dy}*e^{-\int_{m_{i0}}^{m_{i0}+x}\mu_{di0}(y)dy}*e^{-\int_{f_{i0}}^{f_{i0}+x}\mu_{wi0}(z)dz}\right)-\ln\left(e^{-\int_{m_{i1}}^{m_{i1}+x}\mu_{mi1}(y)dy}*e^{-\int_{m_{i1}}^{m_{i1}+x}\mu_{di1}(y)dy}*e^{-\int_{f_{i1}}^{f_{i1}+x}\mu_{wi1}(z)dz}\right)$$

$$¿\ln\left(e^{-\int_{m_{i0}}^{m_{i0}+x}\mu_{mi0}(y)dy}\right)+\ln\left(e^{-\int_{m_{i0}}^{m_{i0}+x}\mu_{di0}(y)dy}\right)+\ln\left(e^{-\int_{f_{i0}}^{f_{i0}+x}\mu_{wi0}(z)dz}\right)-\ln\left(e^{-\int_{m_{i1}}^{m_{i1}+x}\mu_{mi1}(y)dy}\right)-\ln\left(e^{-\int_{m_{i1}}^{m_{i1}+x}\mu_{di1}(y)dy}\right)-\ln\left(e^{-\int_{f_{i1}}^{f_{i1}+x}\mu_{wi1}(z)dz}\right)$$

$$¿-\int_{m_{i0}}^{m_{i0}+x}\mu_{mi0}(y)dy-\int_{m_{i0}}^{m_{i0}+x}\mu_{di0}(y)dy-\int_{f_{i0}}^{f_{i0}+x}\mu_{wi0}(z)dz+\int_{m_{i1}}^{m_{i1}+x}\mu_{mi1}(y)dy+\int_{m_{i1}}^{m_{i1}+x}\mu_{di1}(y)dy+\int_{f_{i1}}^{f_{i1}+x}\mu_{wi1}(z)dz$$

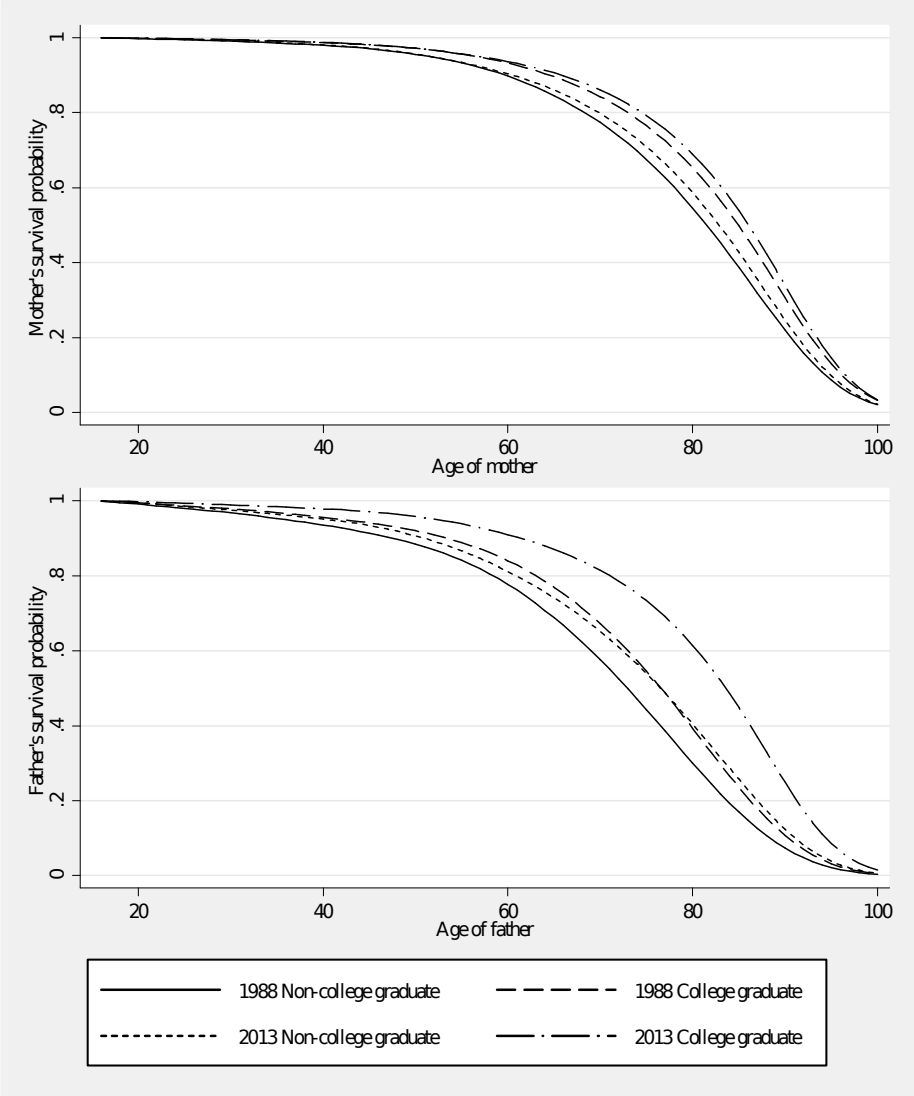
$$¿\int_{m_{i1}}^{m_{i1}+x}\mu_{mi1}(y)dy-\int_{m_{i0}}^{m_{i0}+x}\mu_{mi0}(y)dy+\int_{m_{i1}}^{m_{i1}+x}\mu_{di1}(y)dy-\int_{m_{i0}}^{m_{i0}+x}\mu_{di0}(y)dy+\int_{f_{i1}}^{f_{i1}+x}\mu_{wi1}(z)dz-\int_{f_{i0}}^{f_{i0}+x}\mu_{wi0}(z)dz$$

The data cannot directly observe individual μ's at each mother's or father's age.

Only the cumulative hazard can be observed $\acute{\mu}_{xmij}=\int_{m_{ij}}^{m_{ij}+x}\mu_{mij}(y)dy$ for each cohort-education-respondent age group and the corresponding instantaneous hazard $\hat{\mu}_{mijx}$ is derived under assumption of constant hazard across x years of exposure.

$$\sum_{x=25}^{49} c_{ij}(x)*\ln\left(\frac{P_{xi0}}{P_{xi1}}\right)=\sum_{x=25}^{49} c_{ij}(x)*\left(\dot{\mu}_{xmi1}-\dot{\mu}_{xmi0}\right)+\sum_{x=25}^{49} c_{ij}(x)*\left(\dot{\mu}_{xdi1}-\dot{\mu}_{xdi0}\right)+\sum_{x=25}^{49} c_{ij}(x)*\left(\dot{\mu}_{xfi1}-\dot{\mu}_{xfi0}\right)$$

APPENDIX 2. Simulated survival curves of mothers and fathers of adults aged 25-49 in 1988 and 2013 by educational attainment.



Notes

Survival curves are estimated using an adaptation of Brass's indirect method using reports of orphanhood from respondents in the Panel Survey of Income Dynamics (1988, 2013). Complete survival curve between ages 25 and 100 is a relational model of male and female US standards in 1990 and 2010. Values are adjusted for age-distribution of female PSID respondents.