Preliminary Draft –

Please do not cite without Author's Permission

WOMEN'S MARITAL TRAJECTORIES AND THE ACCUMULATION OF PENSION RIGHTS IN GERMANY AND THE UNITED STATES

Anika Rasner[1]

[1] Contact Information: Anika Rasner, German Institute for Economic Research (DIW Berlin), Mohrenstrasse 58, 10117 Berlin, Germany. Email: arasner@diw.de

1 Introduction

Employment-centered pension schemes favor continuous employment careers with no work interruptions and (above) average earnings. In this type of pension scheme, every year of employment counts towards the individual's future pension benefit, because with the payment of social insurance contributions or payroll taxes from their labor income, individuals earn pension entitlements that accumulate over the life cycle and qualify for the receipt of benefits as they retire. Career interruptions stop the accumulation of pension rights immediately and may also have persistent scar effects for the years following the interruption by slowing the accumulation down (Gangl 2006).

It is needless to point out that employment-centered pension schemes are more conducive to the employment careers of men, who work more continuously, interrupt work less often and earn more than women (Arza 2008; Frericks et al. 2007). Women - in particular married women – with different life cycle patterns of work and family choices are structurally disadvantaged (Lillard and Waite 2000). Motherhood and child care responsibilities, but also the resulting disruption in the accumulation of human capital and job-specific skills atrophy limit women's opportunities to accumulate sufficient pension entitlements on their own (Gangl and Ziefle 2009).

In the past, policymakers saw no reason for concern in the low pension rights accrued by women and the considerable gender pension gap , because the majority of women was assumed to be best protected through the old-age pension received by their husband or in case he dies, through the payment of survivor's benefits. The equal sharing of resources in old age among married couples was expected to compensate women in lifelong marriages for their (intermittent) withdrawal from the labor market that limited their chances to earn pension rights on their own (Joshi and Davies 1991).

However, increasing divorce rates experienced by most industrialized countries put pension systems under pressure. Divorce ends the sharing of financial resources in couples not only during working life but also in old age (Ginn and Price 2002). In terms of pension entitlements, divorce is no problem for individuals who were always fully engaged in the labor market during marriage. But vulnerability is high for those with a weak labor market attachment who are financially dependent on their partner. For them to catch up in pension building is difficult given that they jeopardized their earnings capacity during the time being married. It is a well-known fact that the economic consequences of divorce are more severe for women than they are for men (Burkhauser et al. 1994; Duncan and Hoffman 1985; Smock 1994).

The strong ties between marital status and labor supply are well-documented in the literature, but evidence is limited as to how marital trajectories affect the accumulation of pension rights across the individual's working life (Haider et al. 2003). This study compares the interdependencies of women's marital trajectories and the accumulation of pension rights in two diverging welfare states: Germany and the U.S. Both countries under study have mature public pension schemes that are based on a rather similar rationale, but exhibit considerable variations in their welfare state conceptions, the generosity of benefits provided, and the way they handle marital transitions over the life-course. At the same time, both countries experienced massive changes in partnership patterns during the last decades. Germany and the U.S. both saw significant increases in divorce rates in spite of differences in timing and magnitude.[2]

Systematic analyses of cross-country differences possibly identify pervasive incentives in welfare states that perpetuate gender-specific employ-

---

[2] For a comparison of the development of the crude divorce rate in Germany and the U.S. see *Figure A1* in the Appendix.

ment patterns, economic dependencies in couples, and insufficient financial resources in later life depending on their respective marital choices. So far, these studies have been rare because of the lack of access to adequate and comparable longitudinal data that allow us to study the long-run financial consequences of marital choices for pension building by tracking them through to retirement.

Based on two new and unique datasets linking extensive longitudinal survey data with administrative pension records that cover life cycle pension-relevant earnings, this study seeks to shed light on the dynamics of pension accumulation and marital trajectories. For Germany, this study uses data from the Socio-Economic Panel Study (SOEP) matched with the Sample of Active Pension Accounts (SAPA) from the German statutory pension insurance. The reference data for the U.S. provides the Health and Retirement Study (HRS) linked with the 2004 Permissions: Wage and Self-Employment Income (W2), an administrative dataset maintained by the Social Security Administration.[3]

The paper is structured as follows: The next session summarizes the existing literature dealing with the interdependencies of marital choices and labor supply and discusses possible repercussions for the accumulation of pension rights. Section 3 provides a detailed picture of the policy background in Germany and the U.S. with respect to the institutional design of their public pension programs, the treatment of marital transitions in these programs and the underlying welfare state conceptions in both countries. Also in this Section, I state the research hypotheses that direct the empirical analysis. Section 4 presents the data and the analytic ap-

---

[3] Access to these confidential data is restricted. Data are only available under terms of a formal agreement between the Health and Retirement Study and the researcher. The author thanks Prof. Don Taylor and Anne Fletcher at the Sanford School of Public Policy at Duke University for providing access as a supplemental user under the HRS DUA 2004-011 in the name of Donald H. Taylor, Jr.

proach. For the population of retirees, Section 5 provides descriptive and multivariate evidence on the interplay of marital trajectories and retirement outcomes. In Section 6 I take on a dynamic perspective and show how marital trajectories and the process of pension building are intertwined for the pre-retirement cohorts. Section 7 concludes and ends with an outlook on future research.

2 Literature Review

So far, our knowledge is limited as to how marital choices affect the dynamics of pension building over the adult's working life, mainly because adequate data became only recently available.[4] More is known about how marital status or marital transitions affect the short- to medium-term labor supply of men and women. This evidence is valuable because in employment-centered pension schemes, labor supply directly translates into pension entitlements.

Since the late 1970s, much academic attention has been devoted to the link between labor supply and marriage. These studies found that women cut back on their labor supply upon marriage, but also in the years prior to getting married (Heckman and Macurdy 1980; Johnson and Skinner 1986; Mincer and Solomon 1978). Aughinbaugh shows that remarriage in women does not change the odds for the decision of whether to work or not when compared to the first marriage. However, women who worked during their first marriage work more hours in their second marriage (2010). Despite the reduction in labor supply of married women, they still enjoy

---

[4] In Germany, access to administrative data was long time restricted because of confidentiality concerns. National initiatives like the *German Data Forum* (*Rat für Sozial- und Wirtschaftsdaten*) have largely improved the data infrastructure for the social, economic, and behavioral sciences by opening up access to valuable data in the branches of the social insurance system and other public institutions (Rat für Sozial- und Wirtschaftsdaten 2010).

higher levels of economic well-being than divorced women (Smock et al. 1999).[5] Nevertheless, in terms of pension rights, a decrease in labor supply of married women means less pension rights to accumulate.

During the last decades, the transition to divorce and the respective short- and medium-term consequences have received increasing attention. These studies analyzed how marital dissolution modifies the labor supply of individuals (Haardt 2006; Haurin 1989; Johnson and Skinner 1986) or the individual's income position (Jarvis and Jenkins 1999; Jenkins 2008; Poortman 2000) both for men (Kalmijn 2005; McManus and DiPrete 2001) and for women (Smock 1993; Smock 1994). Cross-country studies helped to understand the role institutions play in mediating the economic consequences of divorce (Andreß et al. 2006; Wagner and Weiß 2006). The trigger events[6] literature also stressed how institutions can buffer the impact of potentially disruptive events on household income mobility, distinguishing job-related and demographic events such as unemployment (Gangl 2006; McManus and DiPrete 2001)[7], childbirth (Budig and England 2001), or divorce (DiPrete and McManus 2000; McManus and DiPrete 2001).

Another strand of literature focuses on differences in retirement outcomes across marital status groups. Studies in Germany and the U.S. identified divorcees, especially divorced women, to face an increased risk of old-age poverty (Bundesregierung 2008; Munnell 2004). Divorced women typically have low social security benefits on their own and no additional in-

---

come sources to rely on when living alone (TNS Infratest 2009; Vartanian and McNamara 2002).[8] Based on the available empirical literature, the economic well-being of elderly divorced individuals seems to be more of a concern in the United States (Butrica and Iams 2000; Favreault and Steuerle 2007; Haider et al. 2003) and the UK (Ginn and Price 2002; Joshi and Davies 1991) than in Germany.[9] Little is known about the population of never married individuals that will increase over the next decades. For the U.S., studies show that never married elderly Americans are more likely to experience economic hardship than other marital status groups (Tamborini 2007).

All these works either focus on how the current marital status or marital transitions affect the individual's labor supply or alternatively, how retirement outcomes differ by current marital status. However, little is known as to how the marital history affects retirement outcomes. An exception is the paper by Wilmoth and Koso who illustrate that marital history matters when it comes to wealth outcomes (2002). They show large differences in the wealth outcomes of preretirement adults depending on their marital history as well as substantial gender effects. Substantial changes in the marital histories of the baby boomers also affect eligibility for spousal and widows benefits in the U.S. social security system (Tamborini et al. 2009). Due to the shorter duration of marriages that end in divorce, a growing share of divorced women foregoes eligibility for spousal and widows benefits.

---

[8]   In general, poverty rates for elderly single women are higher in the U.S. than in Germany. In both countries, poverty rates for divorced women are more than double the overall old-age poverty rates. Smeeding and Sandstrom come to the conclusion that elderly living arrangements matter more than age (2005).

[9]   In the U.S., cohorts born between 1940 and 1950 were the first to experience large increases in divorce rates. The majority of these birth cohorts will quit work between 2005 and 2015. In Germany, the cohorts who experienced the rapid rise in divorce in the 1980s will retire approximately ten years later.

This paper follows the line of argument that retirement outcomes and the process of pension building does not depend on marital status or a specific marital event, but rather on a sequence of different marital events across the life-course, namely the individual's marital trajectory. Furthermore, I expect that the repercussions marital trajectories have on the accumulation of pension rights differ depending on the institutional context these trajectories are embedded in. The following research questions guide the empirical analyses.

1. Do retirement outcomes differ across marital trajectories?

2. Do marital trajectories result in different paths of pension building?

3. If marital trajectories matter, to what extent do welfare state context and the institutional design of the pension system explain differences in retirement outcomes?

3 The Policy Background

3.1   The Process of Pension Building

This paper analyzes how marital trajectories affect retirement outcomes and pension building primarily in the public pension scheme in Germany and the U.S. Focusing on the public pension pillar dismisses a great deal of the retirement income picture. It is certainly true that other forms of old age provision such as occupational and private pensions, but also home-ownership (Frick and Grabka 2003; Frick et al. 2010) complement social security benefits. Nevertheless, as a compulsory program in both countries, the social security scheme covers the majority of the population, which is not true for any other type of old-age provision. Social security benefits also make up for the largest share of the total retirement income in Germany and the U.S.

On average, stock market has done greatly over the last years. However, individuals don't live in averages. This means that if a person needs to cash out in the year of retirement, he/she is subject to considerable differ-

ent set of risks. Social security is not prone to these risks and therefore the most important source of old-age income.

Retirement outcomes are the pension benefits individuals receive as soon as they retire. Pension building describes the process of accumulating pension rights across the working life. Typically, individuals earn pension rights through gainful employment. The process of accumulation starts with the first job that is subject to social insurance contributions or payroll taxes and ends with the transition into retirement.[10] The extent to which the accumulated social security wealth is a reflection of the individual's earnings history and retirement benefits are a proxy for the person's life cycle labor market attachment depends on the institutional design of the pension scheme. More specifically, it depends on whether the scheme is funded or pay-as-you-go (PAYG) and on how strict a relation exists between pension benefits and the workers previous contributions or taxes (Barr and Diamond 2006).

3.2 The Institutional Design of Pension Schemes

In defined-contribution (DC) schemes, also called funded individual accounts, individuals pay a fixed share of their earnings that are invested in assets (Barr 2006). The accumulating assets and their returns are typically paid out as an annuity upon retirement. In this type of pension scheme, the size of the final pension benefit is related to a person's lifetime contributions, but more so to the successful accumulation of assets, the rate of interest and life expectancy at the time of retirement. Furthermore, DC

---

[10] In most pension schemes, individuals who work past retirement no longer accumulate pension entitlements but are allowed to work without any limits on earnings as long as they reached the full retirement age, which equally applies to the German and U.S. pension scheme. Matters are more complicated for individuals who retired early. Individuals under the full retirement age are subject to a limit on earnings and if they exceed this limit, a certain amount of their pension benefit is withheld.

plans face a multitude of risks that are out of the individual's control that potentially weaken the relation between pension benefits and previous contributions (e.g. macroeconomic shocks, future earnings, etc.).[11]

Pay-as-you-go schemes are defined benefit (DB) systems. It's in the nature of these schemes that individuals currently in the workforce pay contributions that finance the pensions of current retirees. In PAYG schemes, the relation between benefits and previous contributions is more straightforward than in DC schemes: the retirement income is a reflection of the person's work history. Year in and year out, employees and employers pay a fixed share of their earnings into the public pension scheme that entitles workers to draw benefits as they retire. The pension benefit formula determines how closely contributions and benefits are linked depending on whether all years, the final years or a fixed number of best years enters the equation. Clearly, the contribution-benefit link is closest if all years with pension-relevant earnings are considered in the benefit calculation. In best years schemes however, benefits reflect a positive selection of a person's working career, which is beneficial to individuals with a few years of employment but otherwise weak labor market attachment. Policymakers can install additional provisions that weaken the benefit/contribution link in favor of individuals with a weak labor market attachment or below average earnings. These redistributive provisions include pension entitlements for certain forms of non-employment. Another instrument is the upgrade of below average contributions, for example during the child-rearing years of mothers. Alternatively, pension schemes can redistribute between low and high earners (Barr and Diamond 2006).

The rationale behind the German and U.S. social security scheme is quite

---

[11] For a detailed discussion of the risks associated to fully funded pension schemes see Barr and Diamond (2006).

similar.[12] Both systems are mature PAYG schemes. They are compulsory and cover more than 90 percent of the population in both countries (Kruse 2007; Tamborini et al. 2009). Both systems are employment-centered in that pension building primarily depends on the individual's lifetime pattern of economic activity. The U.S. benefit formula considers the best 35 years, whereas the German considers all years of employment. Because of the stricter benefit/contribution link, the German public pension system installed several provisions to weaken this tie. For example, it gives caretaker credits to the parent who predominantly cares for children or family members in need of care. The U.S. pension system gives no such credits, but redistributes between high and low earners with its progressive benefit formula that provides higher returns to the first than to the last dollar paid in contributions (Steuerle et al. 2004). This brief synopsis illustrates that the institutional design of both pension schemes is quite similar, which is surprising given the significant differences in the way they treat marital transitions in their pension programs and their welfare state conceptions.

3.3 The Impact of Marital Transitions

Despite their similarities in pension design, Germany and the U.S. differ with respect to the eligibility for benefits related to the individual's marital history. The marital status in itself has no impact on the accumulation of pension entitlements, because pension rules are by definition marriage neutral.[13] This neutrality implies that a certain amount of contributions or payroll taxes does not directly render more pension rights for married than for never married individuals. However, certain marital transitions over a person's life-course bring about changes in his or her pension

---

[12] For a brief sketch of the German and U.S. public pension scheme and their respective benefit calculation formulas, see *Tables A1* and *A2* in the Appendix.

[13] In contrast, marriage neutrality does not apply to the German and U.S. tax system.

rights, because they might establish indirect benefit eligibility (Tamborini et al. 2009).

In Germany, married individuals are not entitled to any kind of spousal benefit, whereas the U.S. social security system provides benefits to dependents as soon as the eligible worker retires conditional on the couple being married for at least one full year prior to the application for benefits.[14] The spousal benefit amounts to half of the worker's primary insurance amount (PIA) that depends on the work record of the entitled worker. The U.S. social security system pays spousal benefits as long as the beneficiary is alive. If a married spouse, in addition to the spousal benefit, qualifies for his or her own retired-worker pension, the person is dually entitled, but collects only one benefit, whichever of the two is larger.[15]

The German and U.S. social security system both introduced benefits to divorced spouses in the late 1970s. However, the countries differ with respect to the timing the divorce settlements takes place and the amount of benefits paid. In the U.S., divorced elderly individuals might be entitled to divorced spouse benefits as soon as the entitled worker starts to collect the retired worker benefit. The benefit for the divorced spouse equals 50 percent of the ex-spouses Primary Insurance Amount (PIA).[16] The level of benefits depends on the ex-spouse's work record (Lillard and Waite 2000).

---

[14] The early retirement age of 62 is the earliest possibility for workers to draw social security benefits.

[15] Harrington-Meyer points out the misleading nature of the term *dual entitlement*. Women who are dually entitled receive a combination of benefits consisting of their own retired workers benefit and a share of the husband's benefit. Dually entitled persons receive the same amount of benefits they would receive, if they had never participated in the labor force (1996).

[16] The PIA is the monthly pension benefit a person receives upon reaching the normal retirement age. Ten years of covered earnings over the entire work life are necessary for workers to qualify for the payment of Social Security benefits (Dickert-Conlin and Meghea 2008).

In principle, divorced spouse's benefits are equal to spousal benefits. Both, married and divorced spouses can simultaneously collect benefits from their (ex)-husbands earnings record (The Urban Institute 2009).[17] However, divorced spouses are only eligible to collect benefits from their former spouse's record if the marriage lasted at least ten years.[18] Divorced spouses lose eligibility to divorced spousal benefits if they remarry and then stay married.[19] Remarriage at age 60 and older doesn't terminate the payment of divorced spousal benefits from the ex-husband. Women are the main beneficiaries of this benefit type in the U.S. (Dickert-Conlin and Meghea 2008).

Germany introduced the property settlement of pension entitlements as an element of the new divorce law that came into effect in 1977 (Bundesgesetzblatt I vom 15. Juni 1976).[20] This new law considered the financial effects on both partners and introduced the splitting of pension rights earned within the statutory pension insurance during the marriage. The partner that earned higher pension rights has to transfer half of the difference in entitlements to his/her former spouse. In practice, women are the principal beneficiaries of pension splitting. Typically, women receive premiums, whereas men face a deduction in pension rights. The pension splitting is one way to compensate women for their role as primary caregivers (Mayer and Wagner 1996) at no cost for government. Ex-

---

[17] In fact, there is no limit on the number of divorced spouses that can collect benefits from their ex-husband. If none of the former spouses remarried, they are all eligible to draw divorced spouse's benefits (The Urban Institute 2009).

[18] Before the reform in 1977, divorced workers were eligible for spouse and survivor benefits if their marriage lasted at least 20 years (Steuerle and Spiero 1999).

[19] In case they divorce multiple times, women are entitled to the highest benefit among all husbands.

[20] East and West Germany differed with respect to their divorce legislation. Following reunification, West German divorce law replaced East German law. The new law came into effect starting October 3, 1990. Prior to reunification, divorced East German women were only entitled to two years of alimony payments (Boele-Woelki et al. 2004).

spouses of high earners who had no or only low earnings at their command during the marriage receive larger premiums than ex-spouses with roughly equal earnings. The German pension splitting allocates pension rights equitably between ex-spouses at no additional cost for the government. Given that the splitting takes place right upon divorce, premiums and deductions remain unaffected by remarriage and are not conditioned on the retirement or death of the ex-spouse.

Social security systems in both countries provide benefits to surviving spouses in case an insured worker or entitled retiree dies. In the U.S., the social security system pays 100 percent of the deceased workers PIA as soon as the widow(er) reaches the full retirement age. Divorced survivors may equally qualify for the surviving spouse benefit in case the ex-spouse deceased. This benefit also amounts to 100 percent of the ex-spouses PIA if the marriage lasted longer than ten years and the surviving spouse did not remarry prior to age 60. For surviving spouses the same rules for dual entitlement apply as for married spouses.

In Germany, the surviving spouse qualifies for survivor's benefits if the deceased spouse reached a minimum qualification period of at least five years of contributory and non-contributory periods or already collected a retired workers pension. If the surviving spouse is 45 years or older, he or she qualifies for the major widow(er)'s pension (*große Witwenrente*) that amounts to 60 percent of the deceased spouse's pension benefit.[21] Unlike U.S. widows, the surviving spouse in Germany receives the widow(er)'s benefit immediately and does not have to reach the full retirement age

---

[21] There is also a minor widow(er)'s pension for women who are younger than 45 years. The minor benefit amounts to 25 percent of the entitlement of deceased spouse. For survivor's to qualify for the benefit, the marriage had to last at least one year. Since January 1st 2002, the survivor's pension amounts to only 55 percent of the deceased husbands benefit, but the surviving spouse receives additional credits in case of children (Deutsche Rentenversicherung 2011).

(Immergut et al. 2007). However, own income – whether a retired workers pension or labor income – counts against the survivor's pension. German and the U.S. also differ with respect to the payment of survivor's pensions in case of remarriage. Women in Germany forego their right to a survivor's benefit if they marry again, whereas women in the U.S. are still eligible for survivor's pensions. *Table 1* summarizes the U.S.-German differences in benefits eligibility and marital status.

Table 1 Marital Status and Eligibility for Social Security Benefits in Germany and the U.S.

Marital Status	Germany		U.S.	
	Retired-Worker Benefit	Auxiliary Benefit	Retired-Worker Benefit	Auxiliary Benefit
Never Married	Must have at least 5 years of contributory or non-contributory, but pension-relevant periods	None	Must have at least 40 quarters of covered employment	None
Married	Must have at least 5 years of contributory or non-contributory, but pension-relevant periods	None	Must have at least 40 quarters of covered employment	Up to 50 percent of spouse's PIA if spouse is still living and retired
Divorced	Must have at least 5 years of contributory or non-contributory, but pension-relevant periods	Splitting of pension rights accumulated by both partners during marriage	Must have at least 40 quarters of covered employment	If spouse living, benefits for married women apply; if spouse deceased, widow benefits apply. Only if married for at least 10 years and no re-marriage, otherwise none.
Widowed	Must have at least 5 years of contributory or non-contributory, but pension-relevant periods	55 percent of deceased spouse's benefit if widow above age 45 and at least one year of marriage, otherwise 25 percent. Foregoes eligibility upon remarriage.	Must have at least 40 quarters of covered employment	Up to 100 percent of deceased spouse's PIA at full retirement age

Source: For the U.S. Tamborini et al. (2009); For Germany Author's illustration

3.4 Welfare States and Incentives

Following Esping-Andersen's seminal work on the varieties of welfare capitalism, Germany and the U.S. fall into two distinct welfare state clusters (Esping-Andersen 1990; Esping-Andersen 1999). While the U.S. is prototypical for the liberal welfare state, Germany represents the conservative type. Each welfare state brings about a unique pattern of social stratification with differences in socio-economic outcomes and employment patterns (DiPrete and McManus 2000; Gangl 2006). Not only do the U.S. and German regime differ with respect to the type and level of benefits provided, they also put a distinct emphasis on what role both government and the market play (Uunk 2004). Furthermore, welfare state institutions set incentives that determine the extent to which men and women engage in the market and in home production (Misra et al. 2007).

In the early 1990s, Fraser identified the crumbling gender order as one of the driving forces behind the crisis of the welfare state (Fraser 1994). Welfare state institutions being based on the classic male breadwinner – female caregiver notion were out of tune with people's real lives leading to inadequacies in social protection. The clear-cut division of labor within the family was abandoned and replaced by more modern welfare state strategies. Today, women are expected to be both - earners and carers, while the role of men remained largely unchanged.

Following Fraser, Misra et al. distinguish four welfare state strategies that deviate more or less clearly from the male breadwinner – female caretaker model (Misra et al. 2007). The *carer strategy* comes closest to the classic model of gender division, expecting women to be caregivers in the first place and wage earners in the second. Under the *earner strategy*, priorities are reversed in that employment comes first and care giving in the second place. The provision of care services by the state is inadequate under both regimes. The *universal breadwinner* and the *caregiver parity* model follow a new gender order. The first strives for gender equity in the labor market by

promoting women's opportunities and leaving the provision of care to government. The latter supports a gender egalitarian division of caretaking and accordingly working. The gendered assumptions embedded in each welfare state strategy are reinforced by a corresponding set of policies and practices.

Germany follows the *carer strategy* with a mix of tax and family policies that contribute to a weak labor market attachment of married women, in particular married women with children.[22] Joint income taxation lacks labor supply incentives for married women, but favors single-earner families with one stay-at-home parent (Steiner and Wrohlich 2004).[23] Family policies set strong incentives for mothers to withdraw from the labor market for a significant amount of time with generous parental leave policies that grant mothers long-lasting job guarantees (Misra et al. 2007). With the payment of parental leave benefits (*Elterngeld*)[24] and child allowances (*Kindergeld*) an immediate return into the job is no economic necessity.[25] Even the public pension scheme compensates mothers for their labor market withdrawal through child care credits and subsidies for those working on low pay or for few hours while raising small children (Rasner 2006).[26] At

---

[22] The *carer strategy* is laid out in Article 6 of the Basic Law of the Federal Republic of Germany, according to which "marriage and the family enjoy the special protection of the state", and further "the care and upbringing of the children is the natural right of parents a duty primarily incumbent on them" (Federal Republic of Germany 1949).

[23] It is not necessarily the presence of children in the household that reduces the labor supply of married women in Germany. Drobnic et al. show that marriage has a negative impact on women's labor market attachment even if it is not linked to motherhood (1999).

[24] The parental leave benefit introduced in 2007 is a wage-dependent benefit paid for a maximum of 14 months, if the father stays at home for at least two months, otherwise eligibility ends after one year. The parental leave benefit replaced the means-tested child rearing allowance (*Erziehungsgeld*) that was paid for a maximum of 24 months (Spieß and Wrohlich 2008).

[25] Stier et al. argue that the interruption of employment doesn't appear to be costly to women, since they are typically working in secondary jobs (2001).

[26] The subsidies for child care credits are for mothers that earn less than 75 percent of the average wage earnings. This benefit is clearly directed towards part-time working

the same time, little action is taken to enable mothers to reconcile work and care responsibilities through adequate provision of public or private care services (Drobnic et al. 1999), especially for women with children below age three (Köppen 2010; Kreyenfeld and Geisler 2006) This explains why employment patterns of married women in Germany are tied much closer to their family life cycle than in most other countries (Blossfeld and Rohwer 1997) leading to a strong economic dependency on the husband's (family) wage (Stier et al. 2001). It is important to point out differences in the welfare state conceptions between East and West Germany. The former East German regime promoted dual earner couples and provided sufficient government-run child care facilities, which resulted in a much stronger labor market attachment of East German mothers that still prevails today (Hanel and Riphahn 2011).

In contrast, the U.S. falls in the cluster of welfare states that follow an earner strategy. Even though the income tax system is marriage-centered as well, U.S. practices and policies aim at treating women as economic equals relative to men (Sainsbury 1999). While the government's role is limited to providing equal opportunities for both sexes in the workplace, market criteria determine whether women operate in the market place or engage in home production (Stier et al. 2001). According to the U.S. welfare state strategy, the primacy of the market renders family-oriented policies and practices that induce married women to work superfluous. This orientation explains the lack of adequate state provided child care services (Misra et al. 2007) or the absence of other forms of compensation for limited labor supply while raising small children. In accordance with the strong market principle, the lack of public child care is compensated for by the broad availability of private sector child care arrangements (Stier et

---

mothers, whereas these subsidies barely pay-off for full-time working mothers.

al. 2001).[27]

In theory, both countries' welfare state regulations are gender neutral in that they don't explicitly assign the carer role to the wife and the earner role to the husband. However, in practice gender inequalities exist in Germany and the U.S., with women working and earning less, staying at home more often and interrupting employment because of care responsibilities.

3.5   Research Hypothesis

Based on the roles assigned to women in each respective welfare state, we expect significant differences in retirement outcomes (average public pension benefits and total retirement income) as well as in the process of pension building. Married women in Germany are caught in the *carer regime*, primarily meeting their obligation as caregivers and facing significant disincentives to take up employment, whereas for women in the U.S. *earner regime*, market work takes priority over caregiving. In both social security systems, retirement benefits reflect the individual's earnings history and pension entitlements are a proxy for a person's life cycle labor market attachment. Because of the *carer strategy* embedded in the German welfare state, married women's labor market attachment is almost inevitably weak. The proportion of part-time work and intermittent employment is significantly higher among married women in Germany when compared with the U.S. (Drobnic et al. 1999; Stier et al. 2001). The marginal labor market involvement and accordingly low pension entitlements of married women in Germany, don't pose a policy challenge if the couple stays married till death do them part. The earner orientation of the U.S. welfare

---

[27]   Even if private sector care is much more prominent in the United States, it is not necessarily affordable for every household (Gornick and Meyers 2003). In contrast, private sector child care is rather uncommon in Germany (Evers et al. 2005).

state results in a stronger labor market involvement of married women. Part-time work or longer periods of labor market withdrawal are rather uncommon, even for women with smaller children. Differences in female labor supply according to marital status are therefore far less pronounced in the U.S. than in Germany, and employment patterns only weakly attached to the family life cycle.[28]

Hypothesis 1: Marital trajectories matter in both countries when it comes to retirement outcomes and the process of pension building. The longer women are married, the lower the pension entitlements they accumulate. The negative effect of being married will be stronger in Germany than in the U.S.

Not only do these differences in welfare state strategies affect pension building in the public pension pillar, but also the access to private and occupational pension schemes (Ginn 2003; Ginn and Price 2002).[29] With the shifting emphasis from pension building being an insurance against income loss to a method for developing assets, the coverage with private and occupational pensions gains importance (Shuey and O'Rand 2006). Given that participation in private and occupational pension schemes highly correlates with labor market involvement, we expect:

Hypothesis 2: Access to private and occupational pension schemes varies by marital history. The longer women in Germany are married, the lower the extent to which they benefit from private and occupational schemes

---

[28] In Germany, the marital union enjoys the special protection of the state, while U.S. public policies are neutral towards family formation and dissolution (DiPrete and McManus 2000). The German welfare state favors marriage over other family forms by granting additional social rights to non-working spouses and their children, such as health insurance or survivor's benefits (Berghahn 2003).

[29] For the UK, Ginn and Price show that private pension coverage is highest for full-time employees in their thirties, which coincides with the time of family formation for the majority of young couples and hence, a weaker labor market attachment of women (Ginn and Price 2002).

when compared to their U.S. counterparts.

How do women in Germany and the U.S. fare in terms of retirement outcomes and the process of pension building when they experience a divorce? During their marriage, wives benefit - albeit to a different extent in both countries - from a household income mainly provided by their husband. The adverse financial effects of divorce are therefore stronger for women (Burkhauser and Duncan 1989) and it takes them much longer than men to return to the level of pre-divorce material well-being (Burkhauser and Duncan 1988). In spite of alimony and child support payments[30] from their ex-partners, women are required to work in order to make a living and to accrue their own pension rights unless they opt to remarry.

The distinct welfare state strategies followed in Germany and the U.S. can provide an indication of how women differ in their coping strategies in the aftermath of a divorce. For German women, divorce not only sets an end to the strong reliance on the husband's economic resources. It also forces them to give up their role as primary caregivers and to step up in their role as earners. At the same time, care duties remain the same with adequate state-provided care support lacking (Gornick and Meyers 2003). This shift in responsibilities implies that divorced women have to become earners under adverse conditions.[31] In contrast, U.S. women are expected to be primarily earners whether they are married or divorced. The earner orientation implies a weaker economic dependency on their husband and gives them a stronger financial autonomy. Hence, divorce doesn't trigger a

---

[30] Burkhauser et al. stress that the U.S. is less successful in the enforcement of alimony and child support payments when compared to Germany (Burkhauser et al. 1991).

[31] The German welfare state strongly preserves status differentials. Two tiers of welfare state provision draw a clear line between those inside and outside the labor force with a different set of benefits (means-tested vs. social insurance benefits) being associated to each respective status (DiPrete and McManus 2000).

change in the roles of U.S. women. They remain earners in the earner regime.

The length of marriage effect persists even after the marital break-up. Following human capital theory, periodic separations from the labor market as well as part-time work, both of which are more prevalent in Germany, lead to a depreciation of general and specific human capital and consequently to a decrease in the person's earning capacity (Mincer and Ofek 1982; Polachek 1975). The longer the break, the larger the decline in wages at reentry and the longer the restoration phase to get back to the level of exit wages (Mincer and Ofek 1982).[32] Part-time work restricts women's economic opportunities as well and results in a part-time pay penalty letting them fall behind the wages of women working full-time.[33]

Hypothesis 3: The stronger depreciation makes it more difficult for German women to catch up in pension building following a divorce and takes them longer to make up for their reduced labor supply during marriage. Also, a larger share of divorced women is not able to catch up at all.

4 Data & Analytic Approach

This study employs two unique datasets well designed to study the accumulation of pension rights and retirement outcomes as determined by the work and family choices of women aged 50 to 80 in Germany and the U.S. Both datasets are unique in that they link survey data with administrative pension records. These linked data have never been used in a com-

---

[32] Mincer and Ofek stress that the process of depreciation and restoration is restricted to general human capital of intermittent workers. The loss of job-specific capital is considered to be a *once-for-all* phenomenon due to the separation from the job (Mincer and Ofek 1982).

[33] Among other things, the gap is associated with differences in the type of jobs held by part-time and full-time working women (Manning and Petrongolo 2008) providing only restricted access to job training for part-timers.

parative study before.[34]

German data come from a link of the German Socio-Economic Panel Study (SOEP) with the Sample of Active Pension Accounts (SAPA) maintained by the German Social Security Administration. The SOEP is a broad interdisciplinary household panel study that started in 1984. Today, 26 waves of data are available that cover a representative sample of the total population living in private households in Germany. Most importantly, the data provide detailed information on retirement income, but also extensive information on individual's education and work histories (for more details about the data see Wagner et al. 2007). SAPA data covers a one percent sample of all active pension accounts. These administrative records provide unusually strong pension-relevant earnings histories that stretch back to age 15 and provide monthly information on individual earnings. For Germany, we link 2007 SOEP and SAPA data, with the SOEP being the recipient and SAPA being the donor file. The total 2007 SOEP survey population covers 21,232 individuals. Restricting the population to women aged 50 to 80, leaves us with a sample population of 4,777 individuals.

For the U.S., we use data from the Health and Retirement Study (HRS) merged with administrative records from the Social Security Administration. In 1992, the core survey of the HRS started with a sample of 12,656 individuals that was interviewed every other year. The steady-state design of the study requires that a new cohort of respondents populates the sur-

---

[34] German and U.S. data differ in how survey and administrative information were linked. For Germany, statistical matching was used to match survey and administrative data. This technique doesn't aim at finding the exact same person, but statistically similar individuals in both datasets. For the U.S., record linkage was used to match survey information and administrative records, which links information for identical persons in both datasets. In Germany, record linkage is infeasible for confidentiality reasons. Moreover, no common identifiers are available (for further details see Rasner et al. 2011).

vey every six years to have the sample including all age groups above age 50 (Leacock 2006). Today, the HRS covers more than 26,000 Americans above age 50. Information is collected on their financial situation, retirement, employment, health, and family, etc. For the purpose of this paper, the 2004 HRS core data (wave 7) is merged with restricted data from the U.S. Social Security Administration. The 2004 Permissions: Wage and Self-Employment Income (W2) data covers the HRS respondent's earnings between 1937 and 2003. These earnings are taken from the individual's annual W2 form.[35] From the 16,859 HRS respondents in 2004[36], a total of 7,685 respondents gave permission for their data to be merged with their earnings information. Restricting the population to women aged 50 to 80 leaves us with a sample population of 3,823.[37]

First, the empirical analysis requires a reconstruction of marital trajectories for women in Germany and the U.S. using data from previous waves of data collection in order to have consistent marital histories for each individual starting at age 15. For the older cohorts, these marital histories go from age 15 to 65. Of no interest for the research questions of this paper are information on marital status and marital transitions after age 65, because they have no direct effect on the individual's retirement income and the accumulation of pension income, because the majority of individuals retires at age 65.[38] Marital trajectories of the younger age cohorts go from age 15 to the actual margin of the data, namely 2004 for the U.S., and 2007 for Germany.

---

[35] For information to be available, earnings have to be recorded in the Master Earnings file of the Social Security Administration.

[36] All respondents from the original AHEAD study that covers individuals born in the year 1923 and earlier were excluded from the sample population, because we are not focusing on the oldest-old.

[37] *Table A3* in the Appendix illustrates that respondents who gave permission are not systematically different from respondents who refused the permission for data to be merged.

[38] An exception is the transition into widowhood that changes retirement income through the payment of survivor's benefits.

For the analysis of the relationship of marital trajectories and the accumulation of pension entitlements, we split the sample populations in a retirement and a preretirement sample. The retirement sample includes women aged 65 years and higher, whereas the preretirement sample covers females aged 50 to 64 years. For the retirement sample, the level of pension benefits can be directly observed, because the majority of women already receive retirement income. Therefore, the focus of the analysis is on how marital trajectories impact retirement outcomes: First, retirement income from the public pension scheme, namely the statutory pension benefits in Germany and benefits from the Old-Age, Survivors, and Disability Insurance (OASDI) in the U.S.; and second, total retirement income from public, private and employer pensions. For the younger cohorts, we look specifically at how marital choices affect the process of pension building. This part of the study analyzes annual individual pension-relevant earnings and marital trajectories simultaneously.

In order to compare retirement outcomes across similar marital trajectories in the U.S. and Germany, I first use sequence analysis and optimal matching (OM) techniques (Abbott 1995; Abbott and Tsay 2000).[39] Sequence analysis serves the description of marital trajectories in terms of the number of marital states, the order of marital sequences and their respective length. The application of optimal matching serves the purpose of comparing these marital sequences across large numbers of observations. OM is the most suitable technique to detect similarities between marital sequences. In order to compare sequences, optimal matching makes use of the so-called *Levenshtein distance* (Levenshtein 1966). The distance reflects the costs of transforming any given sequence in the data into another se-

---

[39] For the sequence analysis and optimal matching procedure I make use of a special program *sq.ado* written for the statistical software package Stata. For more details on this program see Brzinsky-Fay et al. (2006). For a more detailed description of the method see Simonson et al. (2011) and Brzinsky-Fay (2007).

quence. The Levenshtein distance calculates the costs based on the *Needleman-Wunsch algorithm* (Needleman and Wunsch 1970). In the calculation, the Levenshtein distance allows for three operations in order to transform one marital sequence into another: substitution, deletion and insertion. In order to calculate the distances between each marital sequence and to identify the minimum costs involved in transforming one sequence into another requires the assignment of costs to each operation. In this application, I choose the default setting of the program routine, a cost of one for insertion and deletion and a cost of 2 for substitution. Based on these assumptions, optimal matching calculates a distance matrix that compares each sequence to every other sequence.

The distance matrix of marital sequences, however, is not meaningful for the analysis. Therefore, a cluster analysis follows that groups marital sequences with similar distances into distinctive clusters. I merge U.S. and German data on marital trajectories to perform the optimal matching and cluster analysis jointly, however keeping the separation of the retirement and preretirement samples. The results allow for an analysis of differences in retirement outcomes and pension building across different clusters of marital trajectories in Germany and the U.S. *Table 2* summarizes the sample year, sample specification, and sample sizes for younger and older birth cohorts.

Table 2   Sample Specification in SOEP-SAPA and HRS-SSA

	Germany	United States
Data source	SOEP-SAPA	HRS-SSA
Year of Data Collection	2007	2004
Sample$_{Preretirement}$	Birth Cohorts: 1943 -1957 Ages: 50 to 64 years Sample Size: 2,679	Birth Cohorts: 1940-1954 Ages: 50 to 64 years N: 1,989
Sample$_{Retirement}$	Birth Cohorts: 1927-1942 Ages: 65 to 80 years Sample Size: 2,098	Birth Cohorts: 1924-1939 Ages: 65 to 80 years N: 1,834

Source: Author's illustration

5 Marital Trajectories and Retirement Outcomes: Comparing Retired Women in Germany and the U.S.

5.1 Descriptive Results of Marriage Patterns

Changing partnership patterns might increase the vulnerability of certain demographic groups in terms of insufficient financial resources in old age. Both, Germany and the U.S. experienced massive changes in the patterns of family formation and union dissolution. *Table 3* provides summary statistics for the retirement sample population derived from the reconstructed marital trajectories that reflect differences and similarities in marriage patterns in Germany and the U.S. It reports relevant measures for marital status at age 65, the prevalence of selected marital transitions for first and higher-order marriages as well as information on the duration of marital sequences between ages 15 and 65.

Table 3 Marital Status and Marital Transitions of Women in Germany & the U.S., Retiree Population

Variables	HRS-SSA	SOEP-SAPA
Marital Status at Age 65 (in %)		
Never Married	4.0	6.4
First Marriage	51.7	57.4
Second+ Marriage	16.9	6.6
First Divorce	8.2	8.3
Second+ Divorce	5.0	1.1
First Widowhood	10.4	19.8
Second+ Widowhood	3.9	0.5
Marital Dynamics (in %)		
First Marriage	96.0	93.6
→ Stays Married	53.8	61.3
→ Transition into Divorce	30.4	16.7
→ Transition into Widowhood	15.7	22.0
Second Marriage	58.1	25.7
→ Stays Married	52.4	74.9
→ Transition into Divorce	31.5	19.5
→ Transition into Widowhood	16.1	5.6
Third Marriage	45.4	37.5
→ Stays Married	49.4	88.3
→ Transition into Divorce	41.7	11.6
→ Transition into Widowhood	8.9	0.0
Time Spent in Marital States and Length of Marriage (average number of years)		
Never Married	8.4	11.5
Married	36.7	34.2
Divorced	3.9	2.7
Widowed	1.9	2.5
Length of 1st Marriage (of all 1st Marriage)	32.3	34.9
1st Marriages → Divorce	14.8	16.4
Length of 2nd Marriage (of all 2nd Marriages)	19.0	15.7
2nd Marriages → Divorce	10.9	6.9
Length of 3rd Marriage (of all 3rd Marriages)	11.6	9.1
3rd Marriages → Divorce	6.5	5.4
n	1,834	2,098

Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

The descriptive results show that the proportion of never married women is higher in Germany (6.4 percent) than in the U.S. (4.0 percent). In both countries, the majority of elderly women are married at age 65 either in their first or a higher-order marriage (U.S.: 68.6 percent; Germany: 64.0

percent). However, the share of individuals still married in their first marriage is significantly higher in Germany (57.4 percent) than in the U.S. (51.7 percent).[40] In both countries, the share of first time divorcees amounts to more than 8 percent, whereas the share of women with two or more divorces is higher in the U.S. when compared to Germany (5.0 vs. 1.1 percent). With 19.8 percent the share of first time widows is twice as high in Germany as it is in the U.S. (10.4 percent). This finding might indicate that widows in Germany do not remarry, whereas widows in the U.S. are more inclined to remarry after experiencing the death of their spouse.

The middle panel of *Table 3* provides information on marital dynamics. While almost all women enter a first marriage in Germany and the U.S. (96 vs. 93.6 percent), the countries differ with respect to the share of individuals that stay married, get divorced or widowed. In the U.S., only 53.8 percent of individuals stay married in their first marriage, compared to more than 61.3 percent in Germany. More than thirty percent of first marriages in the U.S. end in divorce, but only 16.4 percent in Germany. In turn, the share of individuals whose first marriage ends in widowhood is lower among U.S. women with 15.7 percent compared to more than 22 percent in Germany. U.S. women do not only stand out because of the higher prevalence of first marriages that end in divorce, but also because of higher remarriage rates. Of all women whose first marriage ends in widowhood or divorce, more than 58 percent in the U.S., but only 26 percent in Germany get remarried. Also in second and third marriages, individuals in Germany are more likely to stay married and less likely to get divorced when compared to their U.S. counterparts.[41]

---

[40] *Figure A2* in the Appendix shows the distribution of marital status between ages 15 to 65.

[41] Note that the number of observations for women that enter a third marriage in Germany is very small, hence results have to be interpreted with caution.

Despite the greater fluctuations between marital statuses in the U.S., the average time spent in each status reveals only minor differences when compared to Germany. The time individuals spent being never married is 3.1 years shorter in the U.S. than in Germany, which is due to women in the U.S. marrying at a younger age. Regardless of the higher divorce propensity, women in the U.S. spent more time being married than their German counterparts (36.7 years in the U.S. compared to 34.2 years in Germany).[42] In the U.S., the time being divorced is on average more than one year longer than in Germany (3.9 vs. 2.7 years, respectively).[43] Widowhood plays only a minor role, which is due to the fact that widowhood starts to become more prevalent at higher ages.

The higher prevalence of divorce in the U.S. does not go along with a shorter duration of marriages. On average, first marriages last about 32 years in the U.S., and 35 years in Germany. Clearly, first marriages that end in divorce are significantly shorter (14.8 years in the U.S. and 16.4 years in Germany). The average duration of marriages decreases for higher parity marriages in both countries. Differences in the average length of marriages between the U.S. and Germany are negligible.[44]

---

[42] An explanation for this somewhat surprising finding is that women in the U.S. have higher divorce, but also higher remarriage rates. In this case, divorce and widowhood are an interruption of two marriage sequences. In Germany, divorce and widowhood are more often absorbing states, which implies that after a divorce or widowhood experience, women are not as likely to remarry, but remain in this state (Sackmann and Wingens 2003).

[43] Note that not all individuals in the sample population experienced a divorce. Even though the prevalence of divorce is higher in the U.S., the average time spent being divorced for those who got divorced is significantly higher in Germany than in the U.S. (17.6 vs. 12.9 years, respectively).

[44] On average, individuals marry at a younger age in the U.S. than in Germany (23 years compared to 25 years). The difference in the average age at marriage increases for higher-order marriages. Individuals that enter a second marriage in the U.S. are more than five years younger than in Germany (40 years vs. 45.6 years). For the third marriage this differences increases to more than 7 years (46.8 in the U.S. vs. 53.9 years in Germany).

5.2   Clusters of Marital Trajectories

After examining the differences in marital dynamics of the retirement sample, this Section focuses on similarities in marital patterns among women in Germany and the U.S. using cluster analysis to group similar marital sequences based on the timing, order and length of marital episodes. This analysis clusters the marital trajectories of women in Germany and the U.S. jointly. This proceeding allows for the comparison of retirement outcomes across the same marital clusters that are embedded in two different welfare state contexts. The cluster analysis identifies a total of six clusters that are displayed in *Table 4*.[45]

The reference cluster consists of individuals with the lowest attachment to marriage, namely women who were not married during the entire observation period (*never married*).[46] Characterizing for the second cluster (*late spouses*) are two long sequences: never been married and married. Individuals that fall in this cluster spend an average time of 35.7 years in the status never married, and 12.1 years in the status married. Divorce and widowhood sequences are negligible in the second cluster. Cluster 3 covers *early-life divorcees* that spent most of the time between ages 15 and 65 being divorced (29.1 years). Women in this cluster get married around age 22 and spend less than five years being married. The fourth cluster (*mid-/late-life widows*) consists of individuals that experience widowhood between ages 15 and 65. Women in cluster 4 spend an average time of 25 years being married and almost 18 years being widowed. A significant share of women in this cluster experience widowhood at a relatively young age. The fifth cluster covers *late-life divorcees*. These women are married for more than 30 years and spend almost 14 years being divorced. The most dominant cluster contains *continuously married* women (cluster 5). Individuals in this cluster

---

[45]   For a graphical display of the six clusters see *Figure A3* in the Appendix.
[46]   In the remainder of the paper, I refer to the cluster name given in parenthesis.

enter marriage at a relatively young age and stay continuously married. On average, this cluster is married for 42.1 years. If they interrupt marriage because of divorce or widowhood, they tend to remarry quickly.

Table 4   Clusters of Marital Trajectories and their Prevalence in Germany and the U.S., Retiree Population

	Cluster 1 Never Married	Cluster 2 Late Spouses	Cluster 3 Early-Life Divorcees	Cluster 4 Mid- /Late-life Widows	Cluster 5 Late-Life Divorcees	Cluster 6 Continuously Married
Average Duration ...						
Never Married	51.0	35.7	7.2	7.7	6.6	7.4
Married	0	12.1	4.6	25.1	30.7	42.1
Divorced	0	2.5	29.1	0.5	13.6	0.8
Widowed	0	0.7	0.1	17.7	0.1	0.6
Average Number of Marital Episodes	1	2.4	3.7	3.1	3.7	2.6
Prevalence of Cluster ...						
Germany Share in Percent/(n)	6.4 (85)	1.3 (27)	6.3 (105)	11.9 (209)	3.0 (52)	71.1 (1,620)
U.S. Share in Percent/(n)	4.0 (76)	1.4 (32)	8.0 (156)	8.3 (161)	5.3 (94)	73.1 (1,315)

Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

Table 4 also provides information on the distribution of clusters among women in Germany and the U.S. including the number of observations in parentheses. The continuously married cluster is the most dominant across all groups, but more so among women in the U.S. than in Germany. The higher remarriage rates in the U.S. might be one explanation for this finding. In case of a marital split, women in the U.S. tend to remarry instead of staying divorced. Never married women are more common in Germany than in the U.S., whereas late spouses are equally rare in both countries. Because of the higher divorce propensity in the U.S., it is not surprising that women in the U.S. are more likely to fall in one of the two divorcee clusters. It applies to both countries that the share of early-life divorcees is higher than that of late-life divorce. The pattern of widowhood in mid- or late-life without remarriage is more common among women in Germany than in the U.S. The average number of episodes in each cluster ranges from 1 in the never married cluster to almost 4 differ-

ent marital episodes in the both divorcee clusters, which underlines that some marital trajectories are more dynamic than others. Overall, the number of observations in each cluster is sufficiently high to analyze marital trajectories and retirement outcomes of women in Germany and the U.S. The cluster covering late spouses is the only exception; hence results have to be interpreted with caution.

5.3 Retirement Outcomes and Marital Trajectories

5.3.1 Descriptive Findings

Can we observe differences in retirement outcomes across marital trajectory clusters? This section compares two indicators for retirement outcomes, namely 1) the average social security benefit (*Figure 1*) and 2) average total retirement income[47] (*Figure 2*) across the six marital clusters.[48] The never married cluster is the reference cluster to which the other clusters relate to (see ratio columns). In line with the research hypotheses set out in *Section 3.5*, marital cluster differ greatly with respect to their retirement outcomes, with differences being more pronounced in Germany than in the U.S. Overall, women in the never married cluster fare best when compared to women in the other clusters. This finding applies to Germany and the U.S. and holds for social security as well as total retirement income. In Germany, there is a clear tendency that clusters with longer episodes of marriage have lower levels of social security benefits, which does not apply to women in the U.S.

---

[47] The total retirement income includes benefits from the public pension scheme (own retired-workers and survivor's benefits), employers' pensions as well as annuities from private pension funds.

[48] The tables provide annual benefit and income information as of 2004 for the U.S. and 2007 for Germany, respectively. Differences in years of data collection and currencies are of no concern, because the paper's focus is on within- instead of between-country differences.

Figure 1   Average Public Pension Benefit across Marital Clusters in Germany and the U.S.
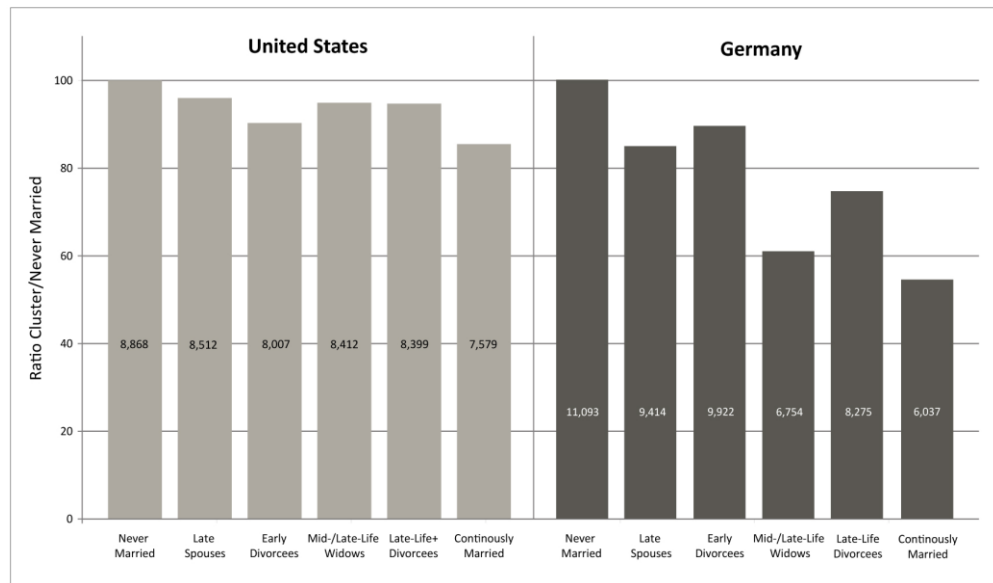
Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

In both countries, the social security benefit gap is widest between the continuously married and never married cluster. However, with 46 percent the gap is far more pronounced in Germany than in U.S. (15 percent). The strikingly low social security benefits of continuously married women in Germany indicate a weak labor market attachment and go along with a strong financial dependence on their husband. In contrast, continuously married women in the U.S. with low retired worker pensions on their own, benefit from the payment of spousal benefits, whereas women in Germany don't. Unfortunately, the U.S. data does not allow for a separation of benefits from own contributions and benefits from the (deceased) spouse or ex-husband of dually entitled women. However, statistics from the Social Security Administration provide valuable insights.[49]

---

[49]   Of all women aged 65 to 80 in 2004, more than 70 percent are entitled as workers and 30 percent as wives only (14 percent as wives and 16 percent as widows). Of the women who are entitled as workers, 61 percent are entitled as workers only, 22 percent receive a combined retired-worker benefit and secondary spousal benefit and 17 percent receive a combined retired-worker benefit and secondary widow's benefit. Women eligible for worker benefits only, receive on average $800, whereas dually entitled wives receive an average benefit of $570 with 66 percent of this benefit coming

These numbers indicate that about 28 percent of women receive spousal benefits, either as a combined or exclusive benefit. The benefit amounts of these women are below average with the retired-worker benefit being much higher than the secondary spousal benefits. Hence, spousal benefits are not the only explanation for the better financial position of continuously married women in the U.S., but also their stronger labor market attachment.[50] The on average significantly higher age at first marriage of women in the late spouses cluster in Germany makes them more similar to never married women. In the U.S., late spouses fare even better because they are potentially eligible for spousal benefits on top of their own social security benefit.[51] For the U.S., women in the mid-/late-life widows cluster benefit from the payment of survivor's benefits, which explains why average social security benefits of this cluster come close to the benefits of never married women in the U.S. Dually entitled widows receive almost $1,200 in monthly social security benefits (Social Security Administration 2006). The average benefit of the German cluster of mid-/ late-life widows is only slightly higher than that of continuously married women. They receive 60 percent of never married women. If survivor's benefits were included, the average social security benefit of mid-/late life widows in Germany would increase from 6,755 to 12,410 Euro, topping the average benefit of the never married cluster by 12 percent.

Figure 1 reveals interesting differences in the two divorcee clusters. When compared to the cluster of never married women, early divorcees fare better than late divorcees in Germany, whereas it is the other way around in

---

from own contributions and 34 percent from the spousal benefit. Women who receive spousal benefits exclusively receive an average payment of $480 (Social Security Administration 2006).

[50] The analysis on pension building in the preretirement sample will shed more light on this question.

[51] However, if late spouses have high retired-workers benefits they might not be eligible for additional spousal benefits.

the U.S., even though differences are rather negligible. For Germany, findings for the two divorcee clusters highlight again that benefit levels decrease with an increasing duration of marriage. Women who experience divorce early and then stay divorced have to provide for themselves because they can no longer rely on the sharing of financial resources with their husband. Hence, an increase in labor supply equally boosts their social security entitlements. In contrast, women who experience divorce later in life, often have little time to catch up in making provisions for retirement if they (partially) withdrew from the labor market during their marriage. The splitting of pension rights between ex-spouses upon divorce results in higher pension rights with divorced women being the primary beneficiaries. However, not all women in this cluster benefit from the splitting because the policy was not introduced until 1977. Late divorcees in the U.S. fare better than their counterparts in Germany. Because the majority of these women are eligible for the receipt of divorced spousal benefits, whereas early divorcees possibly forego eligibility because their marriage lasted less than 10 years and they cannot collect benefits from their ex-husbands record. Late-life divorcees might also benefit from the even higher widow's benefits if their ex-spouse deceased.

Figure 2 compares results for the total retirement income of the six clusters. The overall rank order within each country stays more or less the same after the inclusion of retirement income from employer's pensions and annuities. Across the board, U.S. women benefit to a greater extent from this inclusion than German women, who obviously have limited access to additional forms of old-age provision. For the U.S., differences between the clusters become more pronounced when looking at total retirement income instead of social security benefits alone. Never married women are still on top and continuously married women at the bottom of the distribution with the gap between the two clusters being much larger (33 percent). Taking the total retirement income into account almost doubles the benefits (+99 percent) of never married women indicating good coverage with employer's pensions and annuities. In contrast, mid-/ late-life wid-

ows lose ground when compared to the other clusters. Income from employers' pensions and annuities increases the total retirement income by 55 percent. The same applies to the cluster of continuously married women. Both clusters – mid-/ late-life widows and continuously married - don't gain much through the inclusion of occupational and private pension funds, which illustrates that the majority of women in these clusters not only have low social security benefits, but also insufficient coverage or access to occupational and private pensions.

Figure 2   Average Total Retirement Income across Marital Clusters in Germany and the U.S.
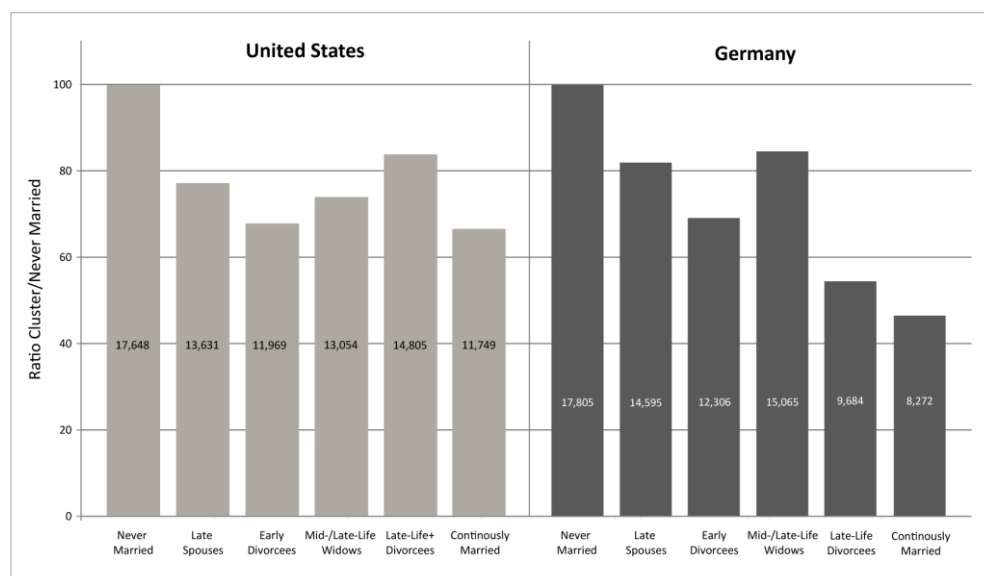
Late-life divorcees come closest to the average total retirement income of never married women in the U.S. The relatively favorable position of this cluster is mainly due to the high average social security benefits, but on top they also have better access to additional retirement income when compared to the widows and continuously married cluster (+ 76 percent). Early divorcees have a less favorable position. Their total retirement income goes up by only 50 percent when additional sources of old-age income are included. Women who divorce at a young age are more likely to have young children to care for, which largely limits their employment capacities, especially their ability to work full-time. Hence, care responsibilities also have repercussions for pension building in the public pension

scheme as well as for the access to employer's and private pensions.

The distribution of total retirement income across marital clusters in Germany reveals even larger disparities. Continuously married women have only 46 percent of the total retirement income of never married women. With the inclusion of employers and occupational pensions, continuously married women gain only 37 percent, whereas never married women gain 61 percent from these additional forms of old-age provision. Mid-/late-life widows benefit most. This improvement is not due to their good coverage with employer's pensions and annuities, but mainly because of the inclusion of survivor's benefits. Otherwise, their gain from total retirement income would be even lower than the levels of continuously married women. Unlike late-life divorcees in the U.S., the German counterparts fall way behind. They gain only 17 percent through the inclusion of occupational and private pensions. Late-life divorcees in Germany cannot rely on the payment of divorced spousal or widow's benefits as do women in the U.S. After being married for most of time between age 15 and 65, they divorce at a relatively high age. This situation does not give these women enough time to catch up in pension building. If they had not started an occupational or private pension plan while being married, they face substantial access barriers to these sources of old-age provision after divorce. Early-life divorcees face a better situation than late-life divorcees, which is mainly due to their high social security benefits and not because of their better coverage with employer's and private pensions. For example, early-life divorcees have more in social security benefits than late-life divorcees have in total retirement income. With the inclusion of additional retirement income, early-life divorcees gain another 24 percent on top of their social security benefit.

These first descriptive findings confirm the hypothesis that marital trajectories have a significant impact on retirement outcomes in both countries. The effects are much more pronounced in Germany, where the strong carer notion embedded in its welfare state sets strong disincentives for

married, especially continuously married women to work and make provisions for their own retirement. In the U.S., the picture is less clear-cut. The less marked differences might be either due to the higher labor market attachment of U.S. women irrespective from their marital choices or due to the potential availability of spousal and divorced spousal benefits as well as generous survivor's benefits that extenuate differences across marital clusters. The multivariate analysis might shed more light on this question.

5.3.2 Multivariate Analyses

By and large, the multivariate analyses confirm the descriptive findings. This section presents results of two multivariate OLS regression models for Germany and the U.S. with annual public pension benefits being the dependent variable.[52] Unlike other income measures, the distribution of public pension benefits is not largely skewed in both sample populations. Therefore, there is no need for a logarithmic transformation of the dependent variable.

The main explanatory variables are the six marital clusters with the never married cluster being the reference cluster. Two dummy variables indicate whether a woman experienced a divorce or widowhood if they do not fall

---

[52] By definition, public pension benefits have a lower and upper limit with the lower limit being equal to zero. The maximum contribution ceiling in Germany and the taxable maximum in the U.S. not only limits the amount of contributions and payroll taxes an individual pays, but also mark the upper limit of pension payments. This limited dependent variable calls for a *tobit* instead of an *OLS regression*, because OLS is likely to produce inconsistent estimates (Wooldridge 2002). However, robustness checks did not reveal substantial differences in coefficients and standards errors from OLS or tobit regression, which justifies the presentation of OLS results in this paper. The lack of differences in standard errors might be due to the fact that only a small share of women reaches the upper limit of pension benefits, because they typically earn less and have less continuous employment careers. In contrast, the public pension benefits of men will have positive probability mass at one or more points of the distribution.

in the widow and the two divorce clusters.[53] The model also controls for post-retirement changes in marital status, namely the transition to widowhood. This control variable should have a strong positive effect in the U.S., but not in the German model.[54] The variable indicating whether the spouse receives a social security benefit also takes into account that it is impossible to separate own retired-workers benefits from spousal benefits. The variable number of children and its interpretation is straightforward: the more children a woman gave birth to, the lower her public pension benefit. The categorical variable educational attainment takes differences in the educational system in Germany and the U.S. into account. The German variable for educational attainment distinguishes six categories: lower secondary education (*Hauptschule*), medium secondary education (*Realschule*), A-levels (*Abitur*), college degree, no degree, degree unknown. The U.S. variable for educational attainment distinguishes five categories: less than high school, General Education Development (GED), high school, some college, college degree.[55] The model also controls for vocational training, which is a particularly relevant for Germany where the institutionalized vocational education system serves as a bridge between school and labor market (Brzinsky-Fay 2007). Because social security systems in both countries are employment-centered, the models control for the years of employment, but also whether a person is still working.[56] The U.S. model controls for race and the German model for migration history and

---

[53] This situation pertains to marital trajectories where divorce or widowhood constitutes an interruption of two marriages sequences, but no permanent state. Both variables are set to zero for women who belong to the *early* or *late-life divorcee* as well as the *mid-/late-life widows* cluster.

[54] Remember that the optimal matching only considers marital status information between ages 15 to 65. A transition to widowhood after age 65 makes women in both countries eligible for survivor's benefits. However, German data allows for a separation of own and survivor's benefits, whereas U.S. data doesn't. Hence, the coefficient of the variable *post-retirement widowhood* gives an indication to what extent women benefit from survivor's benefits on top of their own benefit in the U.S.

[55] Please note these differences in the educational attainment categories in *Table 5*.

[56] Restrictions in HRS data don't allow for more detailed measures of the women's employment biographies.

whether a woman lived in East or West Germany at the time of German reunification, because I expect systematic differences between these groups (Hanel and Riphahn 2011). *Table 5* presents coefficients and standard errors that come from two separate estimations, but are arranged in one table to provide a better overview.

The results confirm that marital trajectories matter more in Germany than in the U.S. When compared to the never married, continuously married women in Germany accumulate significantly less in public pension benefits. The same is true for mid- and late-life widows who fare only slightly better than continuously married women. Both clusters are highly financially dependent on their husband's retirement income or in case he dies on the resulting survivor's benefits. Pension benefits of women in the two divorcee clusters and the late spouses cluster are not significantly different from the never married. In the U.S., only the cluster of continuously married women fares significantly worse than never married women. The models include further controls concerning the women's marital history. In the descriptive analyses, it was impossible to separate own retired-workers benefits from spousal or survivor's pensions in the U.S. Controlling for widowhood after age 65 provides a rough estimate of what women gain from receiving survivor's benefits on top of their own pension. The positive significant effect of widowhood after age 65 is therefore in line with the expectation given that women are the primary beneficiaries of survivor's benefits. Women in Germany benefit to the same or even higher extent from survivor's pensions. However, German data allows for a separation of both benefit types, which explains why the coefficient is not significant. In contrast, experiencing divorce has a strong positive effect on pension benefits in Germany.[57] One possible explanation is that women benefit from the pension splitting in case of a divorce. However,

---

[57] Note that the variable is set to zero for women in the two divorcee clusters.

it is also possible that women who once experience a marital split will no longer rely on their husband's financial resources but provide for themselves.

The strong link between marital trajectories and the level of public pension benefits in Germany holds even if the model controls for education- and employment-related variables, the number of children and additional demographic information. The completion of vocational training has a strong positive effect on the level of pension benefits in Germany but not in the U.S. This finding underscores the relevance of this institutionalized system for the school-to-work transition and women's later labor market attachment in Germany. Women in the birth cohorts under investigation were more likely to complete a vocational training than a college degree. For this reason, there is a positive and significant effect of having intermediate secondary education or completed A-levels when compared to women with lower secondary education, whereas a college degree does not bring about significantly higher pension benefit. In the U.S., higher educational attainment results in higher average pension benefits. Hence, women with some college or a completed college degree have significantly higher pension benefits than women who have less than high school. The number of years worked has a strong positive effect on the level of benefits, which is in line with the expectation given that both countries have an employment-centered public pension scheme. The progressive benefit formula in the U.S. might explain the somewhat weaker effect of years worked in the U.S. Working past age 65 has a negative significant effect in both countries. The coefficient might capture two phenomena: First, women who have to work past age 65 because they have insufficient funds for old-age. Or second, women who want to work past age 65 and take partial retirement. Both types of women either did not start to collect pension benefits yet or only draw partial benefits.

Table 5 Determinants of Monthly Pension Benefits of Retired Women in Germany and the U.S.

	Germany		U.S.	
	b	se	b	se
Marital Clusters (Ref.: Never Married)				
Late Spouses	-93.54	(70.35)	-45.54	(69.09)
Early Divorcees	-2.25	(49.23)	32.44	(47.35)
Mid/Late-Life Widows	-167.76***	(44.56)	92.17	(47.24)
Late Divorcees	1.6	(58.86)	1.21	(51.57)
Continuously Married	-243.67***	(39.71)	-90.87*	(46.24)
Experienced Widowhood	35.33	(29.57)	-29.87	(26.63)
Experienced Divorce	147.84***	(27.29)	36.64	(20.32)
Widowed after Age 65	-18.71	(23.68)	289.46***	(29.57)
Number of Children (Ref.: No Children)				
One Child	-56.78*	(27.29)	-59.54	(35.86)
Two Children	-72.22**	(26.36)	-69.21*	(31.83)
Three + Children	-45.54	(27.12)	-82.28**	(29.69)
Educational Attainment[1]				
No Degree	44.51	(42.66)	n/a	
Degree Unknown	5.17	(49.87)	n/a	
Intermediate Secondary School/GED	97.96***	(18.74)	3.05	(37.86)
A-Levels/High school	131.66***	(37.16)	39.72	(21.15)
Some College	n/a		99.72***	(23.81)
College Degree	54.05	(27.77)	93.55***	(26.69)
Received Vocational Training	61.61***	(16.46)	-22.45	(20.23)
Number of Years Worked	10.96***	(0.56)	4.29***	(0.52)
Working Past Age 65	-201.73***	(34.93)	-55.89*	(23.09)
Lived in East Germany	174.77***	(17.02)	n/a	
Migrant	-67.69	(40.68)	21.45	(28.10)
Race (Ref.: Non-Hispanic Black)				
Non-Hispanic White	n/a		61.36**	(22.71)
Hispanic	n/a		-24.87	(35.41)
Other	n/a		-21.98	(54.03)
Constant	425.648***	(42.72)	565.941***	(45.43)
R-Squared	0.377		0.197	
N	2098		1834	

Note: [1]The reference category for educational attainment is lower secondary school (Hauptschule) for Germany and less than high school in the U.S. Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Selected parameter estimates only. Abbreviations: n/a = not applicable. Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

To have children results in significantly lower pension benefits, because women are the primary caregivers in both countries and hence, cut back on their labor supply. In the U.S., results show that the higher the num-

ber of children, the lower the monthly benefit. Having three or more children in Germany does not have a significant negative effect on the level of pension benefits. Separate estimations for East and West Germany can explain this somewhat surprising finding.[58] The coefficients for West Germany are negative and significant, whereas those for East Germany are positive and only partially significant. Hence, in the joint estimation of East and West the opposing effects cancel each other out. This outcome provides evidence that the welfare state context matters. West Germany promoted the division of labor and home production with women being the primary caretaker and if working than mostly as co-earners. Institutionalized child care facilities were available for children aged three years and older, but mainly part-time. The former GDR subsidized families with children, but also promoted full-time employment of both husband and wife enabled by the broad availability of all day child care facilities starting for newborn babies. Consequently, neither the marital trajectory nor the presence of children had negative repercussions for the accumulation of pension rights. This background information explains the strong positive coefficient for living in East Germany at the time of reunification. Migration history has no effect in Germany and the U.S. Effects along racial lines are rather moderate in the U.S. Only non-Hispanic white women have significantly higher monthly pension benefits than Non-Hispanic black women. Overall, the selected variables explain more variation in the monthly public pension benefits of women in Germany than in the U.S.

---

[58] *Table A4* provides the results of separate estimations for East and West German women.

6 Marital Trajectories & Pension Building in the Pre-Retirement Cohorts

6.1   Marriage Patterns and Marital Clusters

Changes in partnership patterns and increasing divorce rates are even more pronounced in the preretirement cohorts. *Table 6* provides summary statistics.[59] Concerning the current marital status, more than two thirds of women in both countries are married either in their first or a higher order marriage. Women in the U.S. are far less likely to be in their first marriage than women in Germany (43.3 vs. 57.4 percent). The share of women who is divorced for the first time is quite similar, whereas the share of women in a second or higher order divorce is higher in the U.S. (6.8 percent) when compared to Germany (3.6 percent). Obviously, widows are not very common because women in the pre-retirement population are still young.

The empirical evidence concerning the marital dynamics reveals that the prevalence of divorce and remarriage is even higher in the pre-retirement than in the retiree population. In the U.S., more than 47 percent of first marriages end in divorce compared to almost 30 percent in Germany. Relative to the retiree cohorts, the divorce risk increases by 55 percent in the U.S. and 76 percent in Germany. First marriages that end in widowhood are far less common in the preretirement cohorts. Not only divorce, but also remarriage rates are higher among pre-retirement women. In the U.S., remarriage rates were already high for the retiree population (58.1 percent), but in the pre-retirement population the rate amounts to 65 percent. However, in Germany only 25 percent of women in the retiree population remarried after their first marriage ended in a divorce compared to 47 percent in the pre-retirement sample. Hence, remarriage be-

---

[59]   For reference information on the retiree population, compare to *Table 3*.

comes more common in Germany as well. The share of women who stay married in their second marriage is higher in Germany than in the U.S. (70.6 vs. 54.6 percent). Consequently, women in the U.S. are more likely to get a divorce or experience widowhood in their second marriage than women in Germany.

Table 6   Marital Status and Marital Transitions of Women in Germany & the U.S., Preretirement Population

Variables	HRS-SSA	SOEP-SAPA
Marital Status at Age 65 (in %)		
Never Married	5.8	6.3
First Marriage	43.3	57.4
Second+ Marriage	23.4	11.6
First Divorce	13.5	12.6
Second+ Divorce	6.8	3.6
First Widowhood	4.5	7.8
Second+ Widowhood	2.8	0.6
Marital Dynamics (in %)		
First Marriage	94.2	93.7
→ Stays Married	45.9	61.4
→ Transition into Divorce	47.2	29.4
→ Transition into Widowhood	6.9	9.1
Second Marriage	64.8	47.0
→ Stays Married	54.6	70.6
→ Transition into Divorce	37.4	26.8
→ Transition into Widowhood	8.0	2.7
Third Marriage	48.8	22.6
→ Stays Married	58.5	79.7
→ Transition into Divorce	36.2	15.2
→ Transition into Widowhood	5.4	5.1
Time Spent in Marital States and Length of Marriage (Average number of years)		
Never Married	9.0	10.1
Married	27.8	27.5
Divorced	5.0	3.9
Widowed	0.9	1.0
Length of 1st Marriage (all 1st Marriages)	23.2	26.7
1st Marriage → Divorce	12.0	12.0
Length of 2nd Marriage (all 2nd Marriages)	15.2	13.8
2nd Marriage → Divorce	7.8	8.9
Length of 3rd Marriage (all 3rd Marriages)	10.2	9.2
3rd Marriage → Divorce	5.6	7.2
n	1,989	2,679

Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

Differences are negligible concerning the time women spend in different marital states. On average, women spend 10 years being never married

and almost 28 years being married. The number of years a women is divorced is on the rise, when compared to the retiree sample.[60] Two factors contribute to the shorter average length of marriages. First, the sample population is younger and the period of observation only goes from age 15 to 50, hence, marriages are shorter. Second, more marriages end in divorce. On average, first marriages that end in divorce last 12 years in the U.S. and in Germany. In the retiree population, the average duration was 14.8 and 16.4 years, respectively. Overall, the results indicate that the propensity to divorce and to remarry is higher in the pre-retirement than in the retiree cohorts (for reference cp. to *Table 3*). These marital patterns are still more prevalent in the U.S. than in Germany, however trends slowly start to converge.

The cluster analysis reflects the changes in marital patterns in the pre-retirement cohort and reveals interesting differences with respect to the number of clusters, the distribution across marital cluster and the prevalence of marital clusters in Germany and the U.S. First, the sequence analysis and optimal matching results in seven distinct marital clusters, adding one more cluster the so-called *remarriage cluster*. The first marriage of women in the remarriage cluster ends at an early age. After some years being divorced, they remarry and stay married. Because of the higher prevalence of divorce and remarriage in the U.S., this new cluster is more common in the U.S. than in Germany (6.5 vs. 2.8 percent). Second, the analysis brings about significant changes in the distribution of women's marital trajectories across marital clusters. The optimal matching for the preretirement cohorts considers marital status information only for ages 15 to 50, because information on marital status and pension-relevant income is right-censored at age 50 for the youngest birth cohort.[61] *Table 7* il-

---

[60] These numbers are not comparable to those of the retiree population because the sample is right-censored.
[61] The decision to right-censor age-specific marital status information at age 50 to per-

lustrates the distribution of marital clusters in Germany and the U.S.

Table 7 Distribution of Cluster of Women's Marital Trajectories in Preretirement Population

Cluster of Marital Trajectories	Germany Share in %	n	U.S. Share in %	n
1_Never Married	4.3	(114)	5.9	(117)
2_Late Spouses	34.6	(927)	22.4	(446)
3_Early Divorcees	2.8	(74)	4.0	(80)
4_Widows	1.8	(48)	2.2	(44)
5_Late Divorcees	7.7	(207)	10.6	(210)
6_Continuously Married	46.1	(1,235)	48.4	(963)
7_Remarriage	2.8	(74)	6.5	(129)

Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

In the retiree cohorts, the continuously married cluster was the dominant marital pattern for more than 70 percent of women in both countries. This finding is also true for the pre-retirement cohorts, but to a lesser extent. In the younger cohorts, more individuals fall in the late spouses cluster reflecting a general trend of women postponing their first marriage to a higher age. The graphical display (compare to *Figure A4* in the Appendix) of the cluster illustrates that late spouses in the pre-retirement sample are not marrying as late as late spouses in the retirement sample, however later than continuously married women.[62] The average age at first marriage of late spouses is 28 years compared to 20 years of continuously married women. More women in the German sample fall in the late spouses cluster, because they tend to marry at a higher age than women in the U.S. (34.6 vs. 22.4 percent, respectively). Permanent widowhood is rare in the pre-retirement cohorts in both countries and much less common than in

---

form the sequence analysis avoids that the missing years influence the distance between sequences of different length and hence, the cluster solution (Brzinsky-Fay et al. 2006). Changes in the distribution across marital cluster are - at least - partly driven by the shorter period of observation.

[62] The increase in the share of women who fall in the *late spouses* cluster is mainly due to the shorter period of observation, which drives the distance measure between the marital sequences.

the retiree cohorts. Late-life divorcees become more common in the pre-retirement cohorts, whereas early-life divorcees are less common when compared to the retiree population. Note that the shorter period of observation also contributes to the changes in the distribution across the two divorcee clusters with the average age at which divorce occurs being significantly lower in the pre-retirement cohort. The share of never married women increases in the U.S., whereas it decreases in Germany. In addition to the changes in the distribution across marital clusters, *Table 7* also illustrates that clusters are less evenly distributed across the two countries of study.

6.2 Paths of Pension Building

The analysis now turns to the process of pension building. In both countries, women accumulate pension entitlements through the payment of payroll taxes or insurance contributions from pension-relevant earnings. Taking on this perspective allows us to compare the paths of pension building over the adult's working life across different marital trajectories.[63] The advantage of this perspective is that pension building only reflects pension rights women accrue from own employment, therefore factoring out any kind of divorced (spousal) or survivor's benefits or redistributive elements, such as child care credits or redistribution between high and low earners. It allows for a straight view on how marital trajectories and women's employment interact.

Figure 3 compares the paths of pension building between ages 25 and 50 across marital clusters in Germany and the U.S. Instead of using age-specific nominal earnings, we calculate the women's relative income posi-

---

[63]   In both datasets, year-specific pension-relevant earnings are available. For the analysis, these earnings are indexed to 2004 dollars and 2007 Euros, respectively and then transformed into age-specific earnings.

tion for each year, which relates the women's pension-relevant income in year x to the average pension-relevant income in this year.[64] Like in previous analyses, the cluster of never married women is the reference group constantly set to 100 to which we compare all other marital clusters. Plotting the upper and lower bound of the 95% confidence interval of never married women, shows whether differences to the other clusters are statistically significant. Never married women fare best in the pre-retirement sample. Overall, their pension-relevant earnings are higher than for any other marital cluster. This finding applies to Germany and the U.S. In Germany, the path of pension building of never married women differs significantly from the paths of all other marital clusters, except for early divorcees. They come close to the path of never married women. Early divorcees have a good chance to eventually to outperform never married women until retirement. In the U.S., only continuously married women and widows have significantly different paths of pension building when compared to the never married. The other clusters end up within the upper and lower bound of the 95% confidence interval of the never married.

Also in the pre-retirement sample, differences across marital clusters are more pronounced in Germany than in the U.S. However, at age 50, the gap between the top and bottom cluster is the same in both countries with more than 40 percent between widows and never married women. The gap between continuously married and never married women is also quite substantial in both countries: at age 50, they have accumulated slightly more than 60 percent of pension-relevant earnings of never married women. However, there is a clearer upward trend in pension building of continuously married women in the U.S. The path of pension building of late

---

[64] The year-specific average pension-relevant income comes from the National Average Wage Index in the U.S. and the *Sozialversicherung-Rechengrößenverordnung* (SGB VI Anlage 1) in Germany (Deutsche Rentenversicherung 2010; Social Security Administration 2011).

spouses in Germany is similar to that of continuously married women; however, with a five year time shift which is a consequence of the higher age at first marriage. At age 50, late spouses end up at the same level as continuously married women. In contrast, pension-relevant earnings of late spouses in the U.S. exceed those of the never married until the late 20s and then fall below. At age 50, the gap amounts to 17 percent between late spouses and never married women. Their accumulated pension-relevant earnings are within the 95% confidence interval.

Figure 3   *Pension-Relevant Earnings between Ages 25 and 50 across Marital Clusters in Germany and the U.S.*
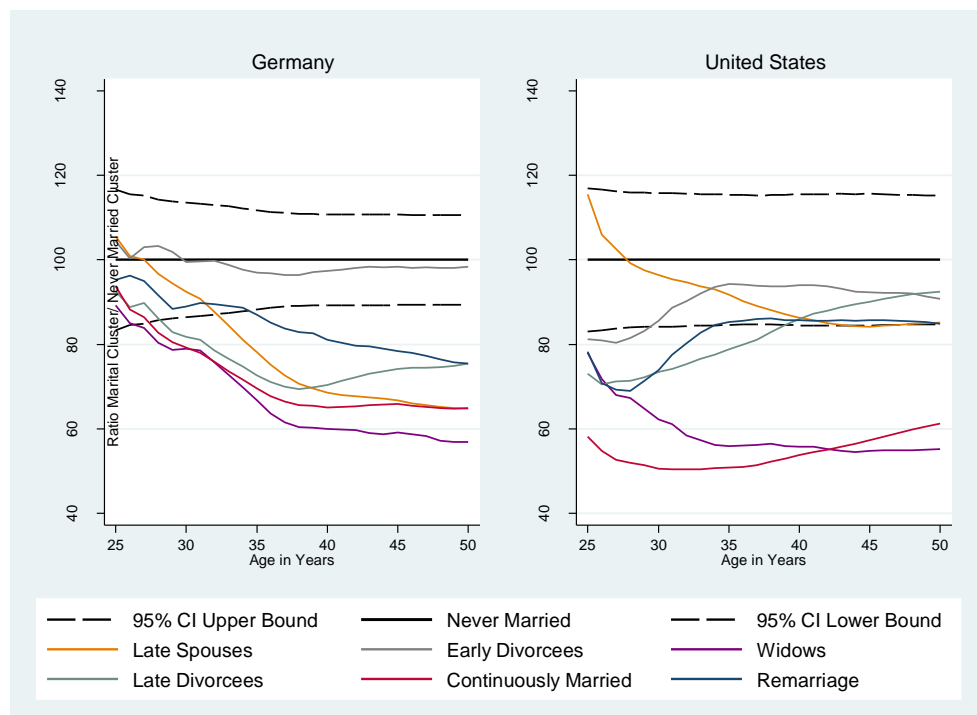
Source: HRS Permissions 2004 and SOEP 2007; Author's Calculations

The results for the two divorce clusters illustrate that the timing of divorce matters in both countries. For early divorcees in the U.S., the gap relative to the never married women is largest around the time of divorce. The same applies to late divorcees in Germany with the gap being signifi-

cantly larger.[65] Obviously, the smaller gap in the U.S. allows divorced women to catch up more easily in pension building despite the clear upward trend following a divorce in both countries. At age 50, the gap between never married and early divorcees amounts to 9 percent in the U.S. and only 3 percent in Germany.[66] For late divorcees, the gap equals only 7 percent in the U.S., but 31 percent in Germany, which indicates that late divorcees in Germany have trouble catching up in pension building. The later the divorce, the more vulnerable women are and the higher their risk of insufficient provisions for old-age.

Marital trajectories also matter in the U.S. when it comes to pension building. Continuously married women and widows lag considerably behind never married women in terms of pension building. It's the contrast with the retirement cohorts that makes evident to what extent, in particular the groups benefit from the payment of spousal and survivor's benefits. The auxiliary benefits they are eligible for almost close the existing gap between continuously married women and widows on the one side and never married women on the other side. It is also important to remember that women in the U.S. benefit from the best 35 years rule. Only their best 35 years count in the pension benefit calculation. This rule compensates for their weak earnings position between the mid-20s and mid-30s. German women, in turn, benefit from caregiver credits.

7 Conclusion

This paper analyzed the impact marital trajectories have on retirement outcomes and the process of pension building of women in Germany and

---

[65] According to the summary statistics in *Table A5* in the Appendix, early divorcees experience the marital split in their late 20s and late divorcees in their late 30s.

[66] Early divorcees in East drive this result. They have a stronger labor market attachment to begin with. The small number of observations does not allow a

the U.S. The distinction between retirement outcomes and the dynamic process of pension building for retirement and pre-retirement cohorts provided valuable insights into the interplay of individual-level and institutional factors in Germany and the U.S. Differences in retirement outcomes and pension building across marital trajectories exist in Germany and the U.S. with differences being more pronounced in Germany.

For the U.S., the comparison of retirement and pre-retirement cohorts reveals greater differences in pension building among the younger cohorts, whereas differences level off when looking at the retirement outcomes of the older cohorts. Obviously, retired women benefit from the payment of (divorced) spousal and survivor's benefits on top of their own-retired worker benefits. These auxiliary provisions make women less vulnerable to the effects of marital transitions, because they compensate women, at least partially, for their weaker labor market attachment, their larger share in home and care work and the resulting financial dependency on their husband during married life. Hence, the U.S. social security system compensates women for potential disincentives embedded in the welfare state set-up. Women who got a divorce also benefit from these auxiliary benefits in case they were married for more than ten years, because they continue to be eligible for spousal and survivor's benefits despite of the marital split. This rule has two positive implications: First, in general, women have to rely to a lesser extent on the equal sharing of resources with their husbands. Second, these provisions allow women in the U.S. to opt out of marriage even at higher ages, because they do not lose eligibility.

For Germany, we found pronounced differences in the paths of pension building by marital trajectories. These differences also prevail for the retirement outcomes of older cohorts. This finding indicates that the German public pension program has almost no provisions to compensate women for their role as primary caretakers, except for the survivor's benefits they receive if their husband dies. Continuously married women

have significantly lower retirement income when compared to women with other marital trajectories, but also relative to their continuously married U.S. counterparts. The lack of effective incentives embedded in the German welfare state that promote married women's labor supply has detrimental effects for successful pension building. The interplay of welfare state settings and individual behavior makes women in Germany particularly vulnerable to marital shocks. This vulnerability grows with every additional year of marriage. Hence, the strong economic dependency on their spouse and the lack of adequate compensating provisions in the German social security scheme might prevent some women who are continuously married from getting a divorce, even though this study does not provide any explicit empirical evidence to support this hypothesis. Possibly, women with low pension benefits on their own stay married because otherwise, they also forego eligibility for survivor's benefits. The empirical evidence illustrates the high economic risk women bear that opt out of marriage later in life. The pension splitting between ex-spouses appears to be a less effective instrument than the divorced spousal and survivor's benefits in the U.S. Late divorcees in Germany have not enough time to catch up in pension building and fail to close the gap to never married women. They still fare better than continuously married women, but typically they have few other income sources to rely on.[67] In turn, women who get a divorce early on in life, succeed to catch up.

From this analysis, it becomes obvious that the German approach to social security simply prolongs the strong financial dependency of women on their husbands into the retirement phase. Hence, continuously married women with low benefits on their own have to rely on the equal sharing of pension benefits with their husband. Even though, evidence on the

---

[67]   Younger birth cohorts will benefit to a greater extent from the pension splitting in case of a divorce. Some women in the retirement cohort did not benefit this provision, because it was only introduced in 1977.

gender wealth gap raises doubts, whether resources in couples are truly equally shared (Sierminska et al. 2010). The situation of married women in Germany can only improve with targeted work incentives that put them in the position to have continuous employment careers. For divorced women might change significantly over the next years in the light of the new German divorce legislation. This new legislation shifts the emphasis from the welfare of ex-wives to the welfare of children. Hence, the law considers it just and reasonable that women with young children have to work and achieve financial independence. This ruling will also have repercussions for the old-age provisions of divorced women.

Despite of the comparative advantage of women in the U.S. and the less strong impact of marital trajectories on retirement outcomes, it is important to keep in mind that spousal and survivor's benefits in both countries come from general tax revenues. Workers pay no extra payroll taxes or social insurance contributions for spousal benefits in the U.S. and survivor's benefits in both countries. From the perspective of women, the current legislation raises questions as to whether it is safe to rely on spousal and survivor's benefits. Given that these benefits are not financed over additional taxes makes it easier for policymakers to cut spousal and survivor's benefits. In the light of population aging, these benefits can become a substantial cost driver that easily overstrains national budgets. From the perspective of policymakers, the payment of spousal and survivor's benefits raises equity concerns. For example, never married individuals with continuous work histories might end up with lower social security benefits than continuously married individuals or widows with a weak lifetime labor market attachment who benefit from the high retired-workers benefit of their husband. These outcomes raise questions whether a more equitable allocation of benefits is feasible. Burkhauser and Duncan wrote that "one method by which women can reduce the relative risk of dramatic drops in well-being is to become more like men" (Burkhauser and Duncan 1989, p. 20). This statement clearly refers to women's employment behavior, but dismisses how marital status and marital history

affect their labor supply and consequently pension building.

References

Abbott, Andrew. 1995. "Sequence Analysis: New Methods for Old Ideas." *Annual Review of Sociology* 21: 93-113.

Abbott, Andrew and Angela Tsay. 2000. "Sequence Analysis and Optimal Matching Methods in Sociology." *Sociological Methods & Research* 29 (1): 3-33.

Andreß, Hans-Jürgen, Barbara Borgloh, Miriam Bröckel, Marco Giesselmann, and Dina Hummelsheim. 2006. "The Economic Consequences of Partnership Dissolution - A Comparative Analysis of Panel Studies from Belgium, Germany, Great Britain, Italy, and Sweden." *European Sociological Review* 22 (5): 533-560.

Arza, Camila. 2008. "Changing European Welfare: the New Distributional Principles of Pension Policy", pp. 109-131. In: *Pension Reform in Europe: Politics, Policies and Outcomes*, edited by Camila Arza and Martin Kohli. London: Routledge.

Aughinbaugh, Alison. 2010. "The Effects of Remarriage on Women's Labor Supply." *Journal of Population Economics* 23 (4): 1151-1176.

Barr, Nicholas. 2006. "Pensions: Overview of the Issues." *Oxford Review of Economic Policy* 22 (1): 1-14.

Barr, Nicholas and Peter Diamond. 2006. "The Economics of Pensions." *Oxford Review of Economic Policy* 22 (1): 15-39.

Berghahn, Sabine. 2003. "Der Ehegattenunterhalt und seine Überwindung auf dem Weg zur individualisierten Existenzsicherung", pp. 105-131. In: *Wohlfahrtsstaat und Geschlechterverhältnis im Umbruch: Was kommt nach dem Ernährermodell?, Jahrbuch für Europa- und Nordamerika-Studien*, edited by Sigrid Leitner, Ilona Ostner, and Margit Schratzenstaller. Wiesbaden: VS Verlag für Sozialwissenschaften.

Blossfeld, Hans-Peter and Götz Rohwer. 1997. "Part-Time Work in West Germany", pp. 164-190. In: *Between Equalization and Marginalization. Women Working Part-Time in Europe and the United States*, edited by H.-P. Blossfeld and C. Hakim. Oxford: Oxford University Press.

Boele-Woelki, Katharina, Frédérique Ferrand, Cristina González Beilfuss, Maarit Jänterä-Jareborg, Nigel Lowe, Dieter Martiny, and Walter Pintens. 2004. *Principles of European family law regarding divorce and maintenance between former spouses*. Antwerpen: Intersentia.

Brzinsky-Fay, Christian. 2007. "Lost in Transition? Labour Market Entry Sequences of School Leavers in Europe." *European Sociological Review* 23 (4): 409-422.

Brzinsky-Fay, Christian, Ulrich Kohler, and Magdalena Luniak. 2006. "Sequence Analysis with Stata." *The Stata Journal* 6 (4): 435-460.

Budig, Michelle J. and Paula England. 2001. "The Wage Penalty for Motherhood." *American Sociological Review* 66: 204-225.

Bundesgesetzblatt I vom 15. Juni 1976. "Erstes Gesetz zur Reform des Ehe- und Familienrechts (1. EheRG)", Seite 1421.

Bundesregierung. 2008. "Lebenslagen in Deutschland: Der dritte Armuts- und Reichtumsbericht der Bundesregierung."228. Bundesministerium für Arbeit und Soziales, Berlin.

Burkhauser, Richard V. and Greg J. Duncan. 1988. "Life Events, Public Policy, and the Economic Vulnerability of Children and the Elderly", pp. 55-88. In: *The Vulnerable*, edited by John L. Palmer, Timothy S. Smeeding, and Barbara B Torrey. Washington D.C.: The Urban Institute Press.

Burkhauser, Richard V. and Greg J. Duncan. 1989. "Economic Risks of Gender Roles: Income Loss and Life Events over the Life Course." *Social Science Quarterly* 70 (1): 3-23.

Burkhauser, Richard V., Greg J. Duncan, and Richard Hauser. 1994. "Sharing Prosperity Across the Age Distribution: A Comparison of the United States and Germany in the 1980s." *The Gerontologist* 34 (2): 150-160.

Burkhauser, Richard V., Greg J. Duncan, Richard Hauser, and Roland Berntsen. 1991. "Wife or Frau, Women Do Worse: A Comparison of Men and Women in the United States and Germany after Marital Dissolution." *Demography* 28 (3): 353-360.

Butrica, Barbara and Howard Iams. 2000. "Divorced Women at Retirement: Projections of Economic Well-Being in the Near Future." *Social Security Bulletin* 63 (3): 3-12.

Deutsche Rentenversicherung. 2010. *Rentenversicherung in Zeitreihen*. Vol. Band 22. Berlin.

Deutsche Rentenversicherung. 2011. "Hinterbliebenenrente: Hilfe in schweren Zeiten." Berlin.

Dickert-Conlin, Stacey and Christian Meghea. 2008. "The Effect of Social Security on Divorce and Remarriage Behavior."45.

DiPrete, Thomas A. and Patricia A. McManus. 2000. "Family Change, Employment Transitions, and the Welfare State: Household Income Dynamics in the United States and Germany." *American Sociological Review* 65 (3): 343-370.

Drobnic, Sonja, Hans-Peter Blossfeld, and Götz Rohwer. 1999. "Dynamics of Women's Employment Patterns over the Family Life Course: A Comparison of the United States and Germany." *Journal of Marriage and Family* 61 (1): 133-146.

Duncan, Greg J. and Saul D. Hoffman. 1985. "A Reconsideration of the Economic Consequences of Marital Dissolution." *Demography* 22: 485-497.

Esping-Andersen, Gøsta. 1990. *The Three Worlds of Welfare Capitalism*. Cambridge:

Polity Press.

Esping-Andersen, Gøsta. 1999. *Social Foundations of Postindustrial Economies*. Oxford: Oxford University Press.

Evers, Adalbert, Jane Lewis, and Birgit Riedel. 2005. "Developing Child-Care Provision in Germany and England: Problems of Governance." *Journal of European Social Policy* 15 (3): 195-209.

Favreault, Melissa M. and C. Eugene Steuerle. 2007. "Social Security Spouse and Survivor Benefits for the Modern Family."29. Center for Retirement Research, Boston.

Federal Republic of Germany. 1949. "Basic Law for the Federal Republic of Germany",

Fraser, Nancy. 1994. "After the Family Wage: Gender Equity and the Welfare State." *Political Theory* 22 (4): 591-618.

Frericks, Patricia, Robert Maier, and Willibrord De Graaf. 2007. "European Pension Reforms: Individualization, Privatization and Gender Pension Gaps." *Social Politics: International Studies in Gender, State & Society* 14 (2): 212-237.

Frick, Joachim R. and Markus M. Grabka. 2003. "Imputed rent and income inequality decomposition analysis for Great Britain, West Germany and the US." *Review of Income and Wealth* (4): 513-537.

Frick, Joachim R., Markus M. Grabka, Timothy M. Smeeding, and Panos Tsakloglou. 2010. "Distributional effects of imputed rents in five European countries." *Journal of Housing Economics* 19 (3): 167-179.

Gangl, Markus. 2006. "Scar Effects of Unemployment: An Assessment of Institutional Complementarities." *American Sociological Review* 71 (6): 986-1013.

Gangl, Markus and Andrea Ziefle. 2009. "Motherhood, Labor Force Behavior, and Women's Careers: An Empirical Assessment of the Wage Penalty for Motherhood in Britain, Germany and the United States." *Demography* 46 (2): 341-369.

Ginn, Jay. 2003. *Gender, Pensions, and the Lifecourse: How Pensions Need to Adapt to Changing Family Forms*. Bristol: Policy Press.

Ginn, Jay and Deborah Price. 2002. "Do Divorced Women Catch Up in Pension Building?" *Child and Family Law Quarterly* 14 (2): 157-173.

Gornick, Janet and Marcia Meyers. 2003. *Families that Work: Policies for Reconciling Parenthood and Employment*. New York City: Russell Sage.

Haardt, David. 2006. "Older Couples' Labour Market Reactions to Family Disruptions."27. Institute for Social & Economic Research, Essex.

Haider, Steven. J., Alison Jacknowitz, and Robert F. Schoeni. 2003. "The Economic Status of Elderly Divorced Women."39. Michigang

Retirement Research Center, Ann Arbor.

Hanel, Barbara and Regina T. Riphahn. 2011. "The Employment of Mothers: Recent Developments and Their Determinants in East and West Germany." IZA Discussion Paper No. 5752 Institute for the Study of Labor (IZA), Bonn.

Harrington Meyer, Madonna. 1996. "Making Claims as Workers or Wives: The Distribution of Social Security Benefits." *American Sociological Review* 61 (3): 449-465.

Haurin, Donald R. 1989. "Women's Labor Market Reactions to Family Disruptions." *Review of Economics and Statistics* 71 (1): 54-61.

Heckman, James J. and Thomas E. Macurdy. 1980. "A Life Cycle Model of Female Labour Supply." *The Review of Economic Studies* 47 (1): 47-74.

Immergut, Ellen M., Karen M. Anderson, and Isabelle Schulze. 2007. "The Handbook of West European Pension Politics." Oxford: Oxford University Press.

Jarvis, Sarah and Stephen P. Jenkins. 1999. "Marital Splits and Income Changes: Evidence from the British Household Panel Survey." *Population Studies* 53 (2): 237-254.

Jenkins, Stephen P. 2008. "Marital Splits and Income Changes over the Longer Term."25. Institute for Social & Economic Research, Essex.

Johnson, William R. and Jonathan Skinner. 1986. "Labor Supply and Marital Separation." *The American Economic Review* 76 (3): 455-469.

Joshi, Heather and Hugh Davies. 1991. "Pension Splitting and Divorce." *Fiscal Studies* 12 (4): 69-91.

Kalmijn, Matthijs. 2005. "The Effects of Divorce on Men's Employment and Social Security Histories." *European Journal of Population* 21: 347-366.

Köppen, Katja. 2010. "Marriage and Cohabitation in western Germany and France." Wirtschafts- und Sozialwissenschaftliche Fakultät, Universität Rostock, Rostock.

Kreyenfeld, Michaela and Esther Geisler. 2006. "Müttererwerbstätigkeit in Ost- und Westdeutschland." *Zeitschrift für Familienforschung* 18 (3): 333-360.

Kruse, Edgar. 2007. "Empirische Ergebnisse zur Erwerbsbeteiligung älterer Versicherter anhand der Statistiken der gesetzlichen Rentenversicherung." *Deutsche Rentenversicherung* (11-12): 716-750.

Leacock, Cindi. 2006. "Getting Started with the Health and Retirement Study." Ann Arbor: University of Michigan.

Levenshtein, Vladimir. 1966. "Binary Codes Capable of Correcting Deletions and Insertions, and Reversals." *Soviet Physics Doklady* 10 (8): 707-710.

Lillard, Dean R. and Linda Waite. 2000. "Marriage, Divorce and the Work and Earning Careers of Spouses."24. University of Michigan Retirement

Research Center, Ann Arbor.

Manning, Alan and Barbara Petrongolo. 2008. "The Part-Time Pay Penalty for Women in Britain." *The Economic Journal* 118 (2): F28-F51.

Mayer, Karl Ulrich and Michael Wagner. 1996. "Lebenslagen und soziale Ungleichheit im hohen Alter", pp. 251-275. In: *Die Berliner Altersstudie*, edited by Karl Ulrich Mayer and Paul B Baltes. Berlin: Akademie Verlag.

McManus, Patricia and Thomas DiPrete. 2001. "Losers and Winners: The Financial Consequences of Separation and Divorce for Men." *American Sociological Review* 66 (2): 246-268.

Mincer, Jacob and Haim Ofek. 1982. "Interrupted Work Careers: Depreciation and Restoration of Human Capital." *Journal of Human Resources* 17 (1): 3-24.

Mincer, Jacob and Polachek Solomon. 1978. "An Exchange: The Theory of Human Capital and the Earnings of Women: Women's Earnings Reexamined." *The Journal of Human Resources* 13 (1): 118-134.

Misra, Joya, Stephanie Moller, and Michelle J. Budig. 2007. "Work Family Policies and Poverty for Partnered and Single Women in Europe and North America." *Gender & Society* 21 (6): 804-827.

Munnell, Alicia H. 2004. "Why Are So Many Older Women Poor?" Just the Facts on Retirement Issues.8. Center for Retirement Research at Boston College, Boston.

Needleman, Saul B. and Christian D. Wunsch. 1970. "A General Method Applicable to the Search for Similarities in the Amino Acid Sequence of Two Proteins." *Journal of Molecular Biology* 48 (3): 443-453.

OECD. 2010. "OECD Family Database 2010." Paris: OECD.

Polachek, Solomon. 1975. "Discontinuous Labor Force Participation and its Effect on Women's Market Earnings", pp. 90-124. In: *Sex, Discrimination, and the Division of Labor*, edited by Cynthia B. Lloyd. New York: Columbia University Press.

Poortman, Anne-Rigt. 2000. "Sex Differences in the Economic Consequences of Separation: A Panel Study of the Netherlands." *European Sociological Review* 16 (4): 367-383.

Rasner, Anika. 2006. "Mind the Gap! Einbeziehung internationaler Benchmarks bei der Beurteilung der geschlechtsspezifischen Rentenlücke in Deutschland." *Deutsche Rentenversicherung* (11-12): 737-754.

Rasner, Anika, Joachim R. Frick, and Markus M. Grabka. 2011. "Extending the Empirical Basis for Wealth Inequality Research Using Statistical Matching of Administrative and Survey Data." SOEPpapers on Multidisciplinary Panel Data Research.44. DIW Berlin, Berlin.

Rat für Sozial- und Wirtschaftsdaten. 2010. "Building on Progress: Expanding the Research Infrastructure for the Social, Economic, and Behavioral

Sciences." vol. 1 & 2. Opladen & Farmington Hills: Budrich UniPress.

Sackmann, Reinhold and Matthias Wingens. 2003. "From Transitions to Trajectories: Sequence Types", pp. 93-116. In: *Social Dynamics of the Life Course*, edited by Walter R. Heinz and Victor W. Marshall. Hawthorne: Aldine de Gruyter.

Sainsbury, Diane. 1999. *Gender, Equality, and the Welfare State*. New York: Cambridge.

Shuey, Kim M. and Angela M. O'Rand. 2006. "Changing Demographics and New Pension Risks." *Research on Aging* 28 (3): 317-340.

Sierminska, Eva. M., Joachim R. Frick, and Markus M. Grabka. 2010. "Examining the Gender Wealth Gap." *Oxford Economic Papers-New Series* 62 (4): 669-690.

Simonson, Julia, Laura Romeu Gordo, and Nadiya Titova. 2011. "Changing Employment Patterns of Women in Germany: How do Baby Boomers Differ from Older Cohorts? A Comparison Using Sequence Analysis." *Advances in Life Course Research* 16 (2): 65-82.

Smeeding, Timothy M. and Susanna Sandstrom. 2005. "Poverty and Income Maintenance in Old Age: A Cross National View of Low Income Older Women."17. Center for Retirement Research, Boston.

Smock, Pamela J. 1993. "The Economic Costs of Marital Disruption for Young Women over the Past Two Decades." *Demography* 30 (3): 353-371.

Smock, Pamela J. 1994. "Gender and Short-Run Economic Consequences of Marital Disruption." *Social Forces* 73 (1): 243-262.

Smock, Pamela J., Wendy D. Manning, and Sanjiv Gupta. 1999. "The Effect of Marriage and Divorce on Women's Economic Well-Being." *American Sociological Review* 64 (6): 794-812.

Social Security Administration. 2006. "Annual Statistical Supplement to the Social Security Bulletin, 2005." edited by Office of Policy. Baltimore.

Social Security Administration. 2011. "National Average Wage Index." Retrieved June 17, 2011, 2011

Spieß, C. Katharina and Katharina Wrohlich. 2008. "The Parental Leave Benefit Reform in Germany: Costs and Labour Market Outcomes of Moving towards the Nordic Model." *Population Research Policy Review* 27 (5): 575-591.

Steiner, Viktor and Katharina Wrohlich. 2004. "Household Taxation, Income Splitting and Labor Supply Incentives - A Microsimulation Study for Germany." *CESifo Economic Studies* 50 (3): 541-568.

Steuerle, C. Eugene, Adam Carasso, and Lee Cohen. 2004. "How Progressive is Social Security and Why?" Straight Talk on Social Security and Retirement Policy.2. Urban Institute, Washington

Steuerle, C. Eugene and Christopher Spiero. 1999. "Does Social Security Treat

Spouses Fairly?" Retirement Policy Brief Nr. 12. Urban Institute, Washington, D.C. .

Stier, Haya, Noah Lewin-Epstein, and Michael Braun. 2001. "Welfare Regimes, Family-Supportive Policies, and Women's Employment along the Life-Course." *The American Journal of Sociology* 106 (6): 1731-1760.

Tamborini, Christopher R. 2007. "The Never-Married in Old Age: Projections and Concerns for the Near Future." *Social Security Bulletin* 67 (2): 25-40.

Tamborini, Christopher R., Howard M. Iams, and Kevin Whitman. 2009. "Marital History, Race, and Social Security Spouse and Widow Benefit Eligibility in the United States." *Research on Aging* 31 (5): 577-605.

The Urban Institute. 2009. "Reform Options for Social Security: Spouse and Survivor Benefits." Retrieved April 15, 2009, 2009 (http://www.urban.org/retirement_policy/ssspousesurvivor.cfm).

TNS Infratest. 2009. "Alterssicherung in Deutschland 2007 (ASID 2007) – Zusammenfassung wichtiger Untersuchungsergebnisse." Bundesministerium für Arbeit und Soziales, Bonn.

Uunk, Wilfred. 2004. "The Economic Consequences of Divorce for Women in the European Union: The Impact of Welfare State Arrangements." *European Journal of Population* 20: 251-285.

Vartanian, Thomas P. and Justine M. McNamara. 2002. "Older Women in Poverty: The Impact of Midlife Factors." *Journal of Marriage and Family* 64 (2): 532-548.

Wagner, Gert G., Joachim R. Frick, and Jürgen Schupp. 2007. "The German Socio-Economic Panel Study (SOEP) - Scope, Evolution and Enhancements." *Schmollers Jahrbuch* 127 (1): 139-169.

Wagner, Michael and Bernd Weiß. 2006. "On the Variation of Divorce Risks in Europe: Findings from a Meta-Analysis of European Longitudinal Studies." *European Sociological Review* 22 (5): 483-500.

Wilmoth, Janet and Gregor Koso. 2002. "Does Marital History Matter? Marital Status and Wealth Outcomes among Preretirement Adults." *Journal of Marriage and Family* 64 (1): 254-268.

Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge MA: The MIT Press.

Appendix

Figure A1 Crude Divorce Rate in Germany and the U.S. between 1970 and 2008
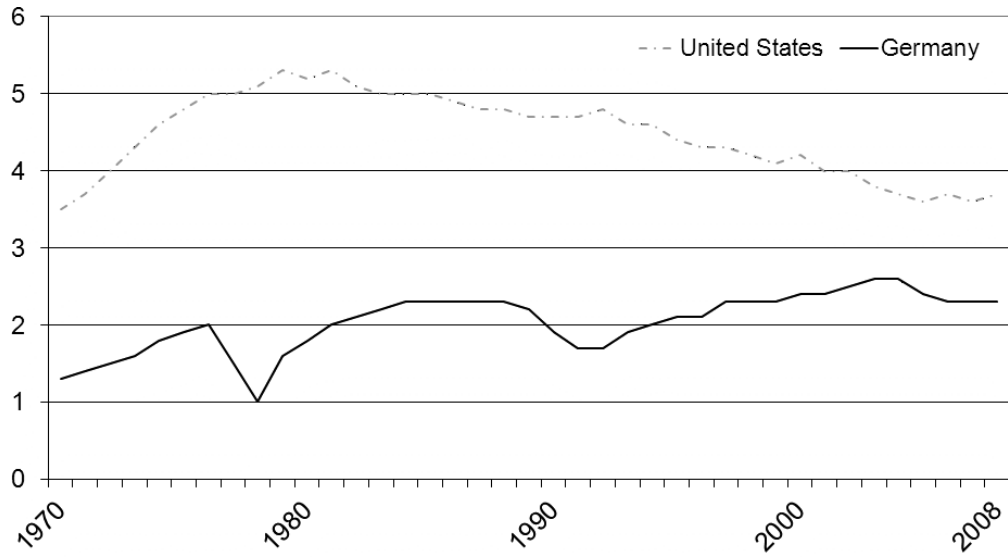
Source: OECD Family Database 2010

Source: OECD Family Database (2010)

Table A1   Synopsis of the German and U.S. Public Pension Scheme

| Criteria	Germany	United States
Type of Pension Scheme	Defined benefit (pay-as-you-go)	Defined benefit (pay-as-you go)
Insurance	Old-age, disability, and survivor's pensions	Old-age, disability, and survivor's pensions
Access	All employees (except for self-employed and civil servants)	All employees (including the self-employed)
Financing	Contributions (2010: 9.95 percent of monthly earnings paid by employee and employer – total of 19.9 percent)	Payroll taxes (2010: 6.2 percent of monthly earnings paid by employee and employer – total of 12.4 percent)
Maximum Contribution Ceiling/ Taxable Maximum	€64,800	$106,800
Eligibility	Minimum of five years (different rules for special pension schemes)	Minimum of ten years (40 quarters in total)
Basis for Benefit Calculation	All years	Best 35 years
Redistribution	Credits for caregiving (children and elderly family members in need of care) Upgrade of below average contributions (for periods of child-rearing or low earnings [only temporary])	Progressive benefit calculation formula beneficial to low earners (bending points)
Administration	statutory pension insurance	Social Security Administration

Source: Author's illustration

Table A2   Pension Benefit Calculation in the Public Pension Schemes in Germany and the U.S.

Criteria	Germany	United States
Benefit Calculation Formula	$PB = EP_i * PV_t * AA_i * PTF_i$	$PIA_i = 0.9 * 1^{st} BP_t + 0.32 * 2^{nd} BP_t + 0.15 * 3^{rd} BP_t$ BP_t refer to $AIME_i$
Factors of the Benefit Calculation Formula	Pension Benefit (PB): Is the monthly pension benefit a person receives. Sum of Earning Points (EPs): EPs describe the individual's earning position relative to the average earnings of all individuals that pay contributions into the public pension scheme in a given month. The EPs are summed up over the entire working life. Pension Type Factor (PTF): Depends on the type of pension a person applies for. The PTF ranges from one (old-age pension) to 0.25 (orphan's pension). Pension Value (PV): The PV serves the adjustment of past earnings to today's wage levels. The PV is equal for all individuals but is adjusted annually. For 2009, the PV amounts to € 27.20 in West and € 24.13 in East Germany. Actuarial Adjustment Factor (AAF): Factor reflects the age of retirement. The factor equals one if a person retires at the normal retirement age. For each month the person retires earlier the factor decreases by 0.3 percent. For each month the person retires later the factor increases by 0.5 percent.	Average Indexed Monthly Earnings (AIME): The AIME considers the 35 highest earning years indexed to growth in wages up to age 60. Best 35 years are first divided by 35 and then 12 in order to get workers average monthly earnings in today's wage levels. Primary Insurance Amount: Is the monthly benefit a person receives if he/she starts to draw benefits upon reaching the normal retirement age (no actuarial adjustment for early or delayed retirement). Bend points (BPs): Serve the purpose of calculating the primary insurance amount (PIA). The bend points decompose the AIME into three parts and assign weights to each respective part. The BPs are adjusted annually. For 2009 they amount to First BP: 90 percent of $0 to $744 of AIME Second BP: 32 percent of $745 to $4483 of AIME Third BP: 15 percent of $4484 > of AIME

Source: Author's illustration

*Figure A2 Marital Status across Age in Germany and the U.S., Retiree Population*
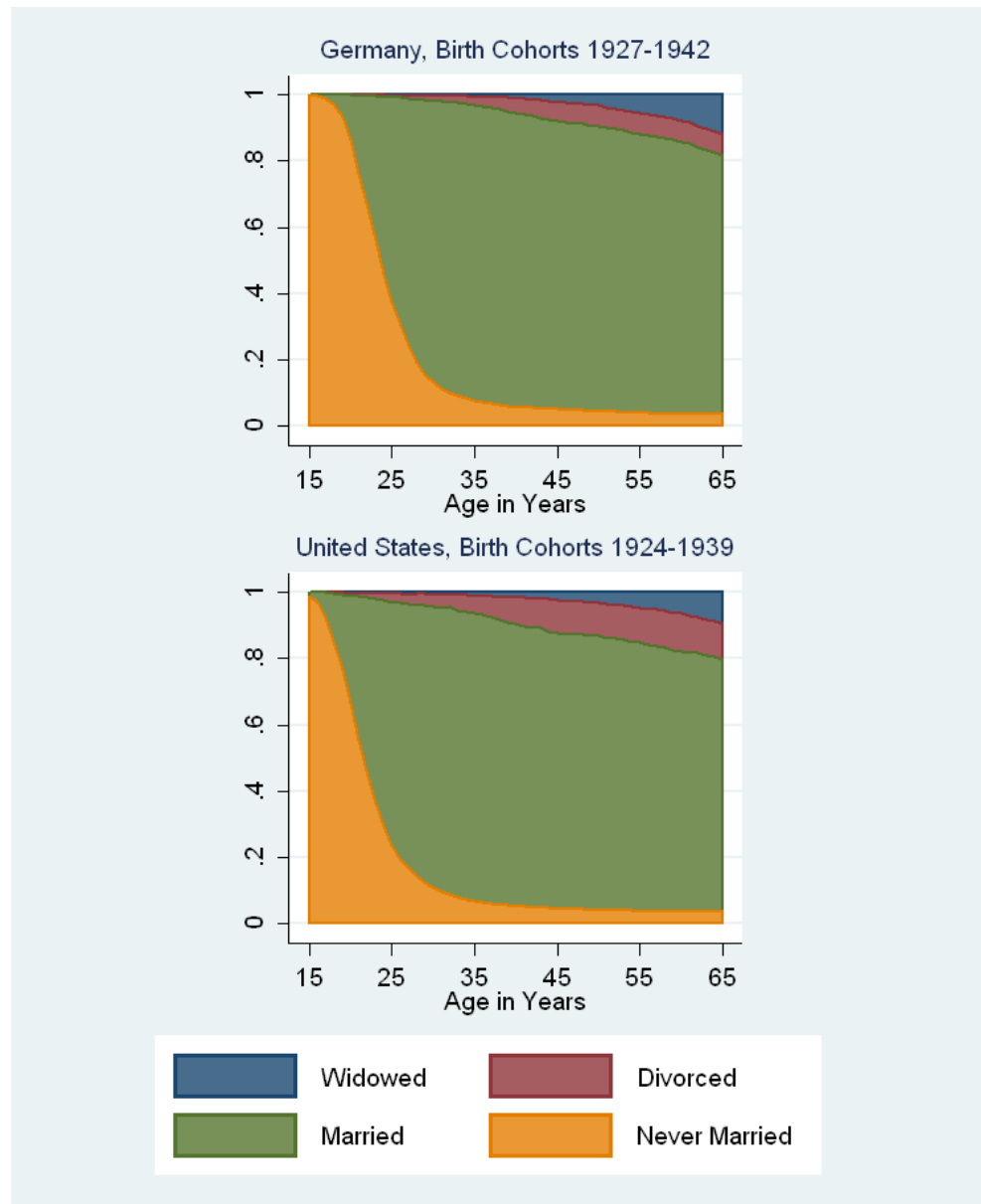
Note: Results are weighted with wave-specific individual-level weights in HRS and SOEP data.
Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

Table A3   Comparing Summary Statistics for HRS and SSA Permissions 2004

Variable	Label	HRS 2004 – No Permission	HRS 2004 – Permission
Gender (in percent)	Male	46.9	49.7
	Female	53.2	50.3
Race (in percent)	Non-Hispanic White	80.9	81.0
	Non-Hispanic Black	9.4	9.4
	Hispanic	7.5	7.1
	Other	3.0	2.6
Age in Years	Mean	62.3	62.3
Census Region (in percent)	North East	16.9	17.9
	Midwest	26.1	24.7
	South	38.0	37.2
	West	18.8	20.2
	Other	0.1	0.1
Years in Education	Mean	12.9	12.9
Education (in percent)	Less than High School	16.7	16.7
	GED	4.5	4.9
	High School Graduate	29.6	29.7
	Some College	23.8	24.6
	College and Above	25.4	25.2
Longest Job Tenure	Mean	18.3	18.0
Children (Average)	Number of Children	2.9	3.1
Marriages (Average)	Number of Marriages	1.4	1.4
Longest Marriage in Years	Mean	28.7	28.7
	Median	30.1	29.8
Never Married (in percent)	Ever Married	95.7	94.9
	Never Married	4.3	5.1
Number of Divorces (in percent)	Zero	63.9	60.2
	One	26.2	28.6
	Two	7.8	8.7
	Three or more	1.8	2.5
Living in Poverty (in percent)		0.09	0.08
Total Household Income	Mean	473,531	450,799
	Median	187,770	170,100
Social Security	Mean	7,734	7,965
	Median	7,800	8,358
Pensions and Annuities	Mean	8,636	8,841
Number of Observations	n	9,174	7,685

Notes: Deviations from 100 percent are due to rounding. The mean value for income from social security as well as pension and annuities only considers persons who report to be fully retired. The median for pension and annuities equals 0, indicating that more than 50 percent of all retired persons don't receive any income from these sources. Source: HRS 2004 and SSA Permissions 2004; Author's calculations

Figure A3 Clusters of Marital Trajectories in Germany and the U.S., Retiree Population
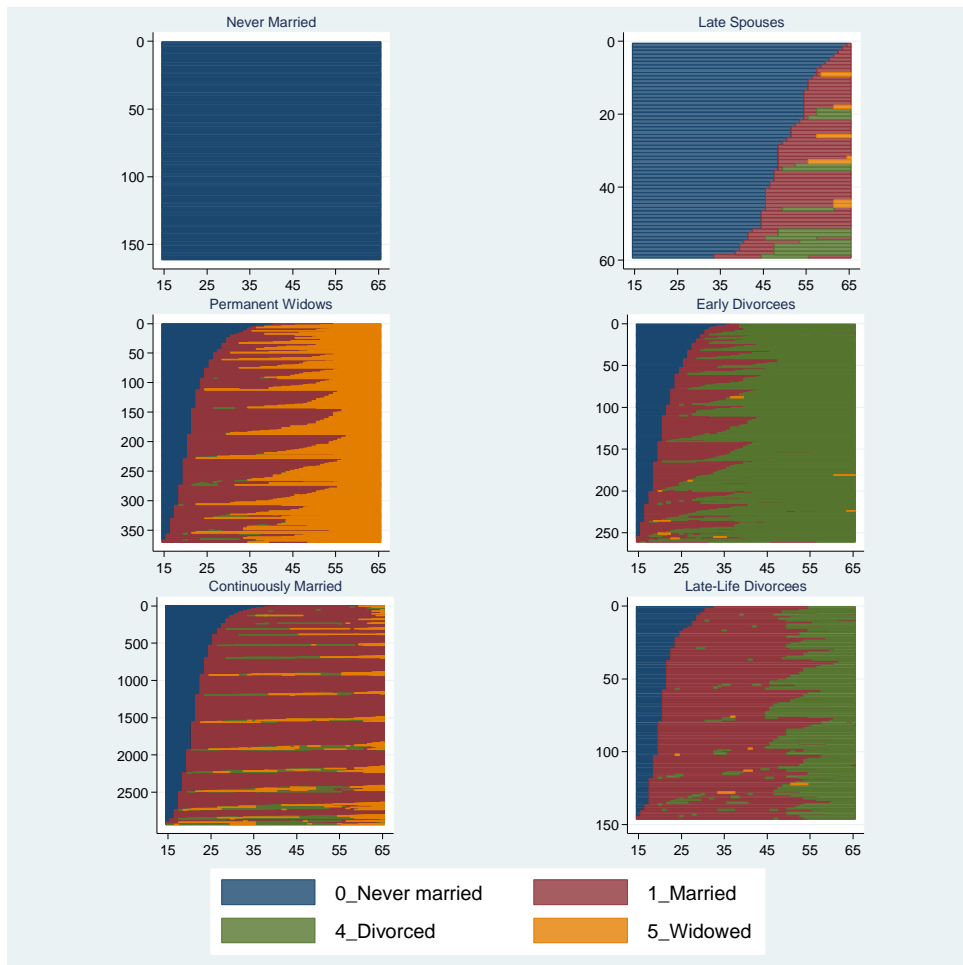

Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

Table A4   Determinants of Monthly Public Pension Benefits of Retired Women in East and West Germany

	East Germany		West Germany	
	b	se	b	se
Marital Clusters (Ref.: Never Married)				
Late Spouses	-145.395	(81.38)	-58.654	(130.77)
Early Divorcees	28.238	(62.37)	-68.856	(66.66)
Mid/Late-Life Widows	-205.995***	(54.47)	-107.617	(64.91)
Late Divorcees	13.593	(72.01)	-92.909	(86.39)
Continuously Married	-288.727***	(49.01)	-169.340**	(56.54)
Experienced Widowhood	56.659	(37.77)	-25.451	(38.48)
Experienced Divorce	213.629***	(33.85)	-14.161	(38.53)
Widowed after Age 65	-9.911	(29.66)	-12.634	(32.58)
Number of Children (Ref.: No Children)				
One Child	-90.655**	(33.97)	47.297	(38.93)
Two Children	-118.428***	(32.29)	67.497	(38.55)
Three + Children	-88.821**	(33.23)	100.455*	(39.66)
Educational Attainment				
No Degree	85.351***	(22.69)	119.459***	(28.15)
Degree Unknown	145.634***	(43.30)	68.069	(64.59)
Intermediate Secondary School	-74.485*	(34.04)	386.966***	(40.85)
A-Levels	49.473	(48.66)	11.015	(83.50)
College Degree	-1.808	(59.47)	10.052	(78.68)
Received Vocational Training	70.475***	(20.01)	58.406*	(24.96)
Number of Years Worked	10.678***	(0.64)	10.901***	(1.22)
Working Past Age 65	-192.631***	(39.13)	-130.076	(78.08)
Migrant	-63.479	(43.63)	.	.
Constant	506.541***	(51.02)	416.111***	(75.19)
R-Squared	0.342		0.29	
N	1529		569	

Notes: [1] The reference category for educational attainment is lower secondary school (Hauptschule). Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Selected parameter estimates only. Abbreviations: n/a = not applicable. Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

Figure A4 Clusters of Marital Trajectories in Germany & the U.S., Pre-Retirement Cohorts
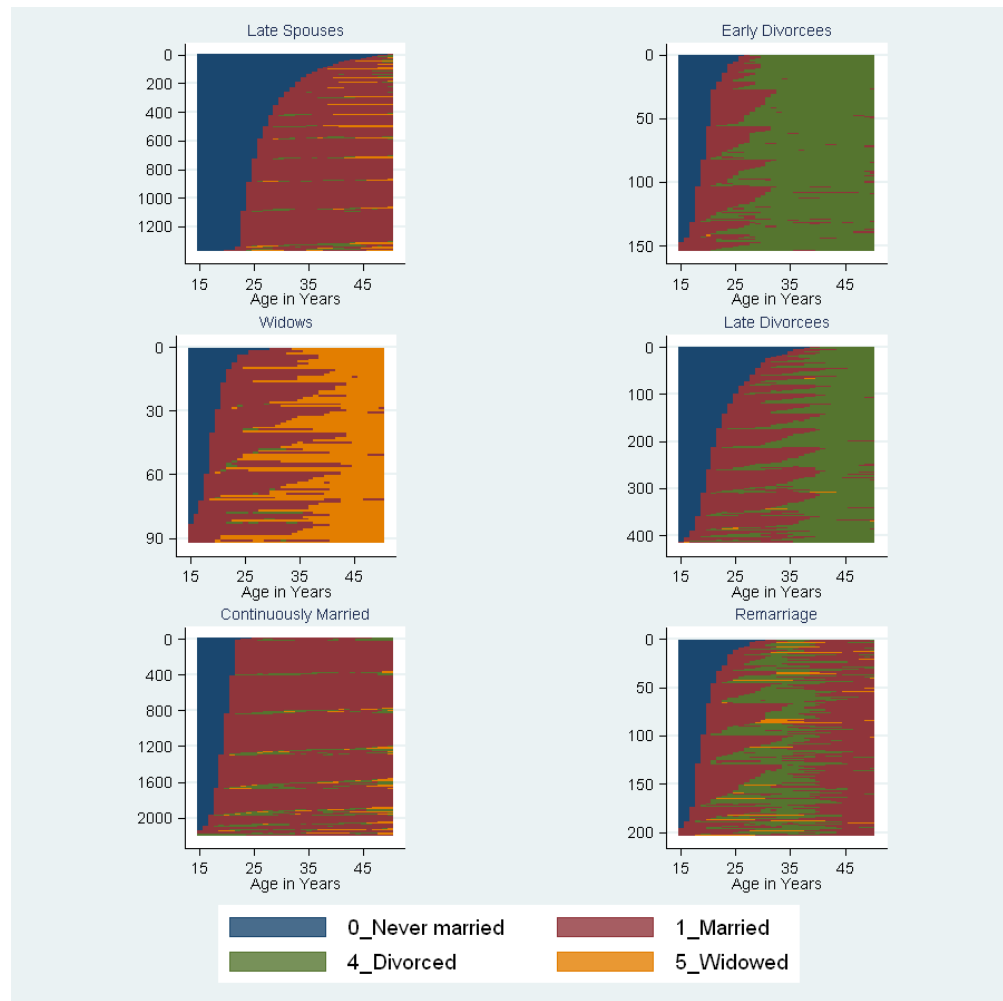
Notes: *Figure A4* omits the never married cluster because the sequence plot is the same as in *Figure A3*. Only the number of individuals that fall in the never married cluster is higher in the pre-retirement cohorts with 114 individuals in Germany and 117 in the U.S., respectively. Source: HRS Permissions 2004 and SOEP 2007; Author's calculations

Table A5   *Clusters of Marital Trajectories and their Prevalence in Germany and the U.S.,*
           Pre-Retirement Population

	Cluster 1 Never Married	Cluster 2 Late Spouses	Cluster 3 Early-Life Divorcees	Cluster 4 Mid-/Latelife Widows	Cluster 5 Late-Life Divorcees	Cluster 6 Continuously Married	Cluster 7 Remarriage
Average Duration being ...							
Never Married	36.0	13.0	4.9	4.2	7.7	4.8	5.1
Married	0	22.4	8.1	16.7	14.8	30.4	19.6
Divorced	0	0.3	23.0	0.5	13.4	0.8	10.5
Widowed	0	0.3	0	14.7	0	0.1	0.7
Prevalence of Cluster ...							
Germany Share in Percent/(n)	4.3 (114)	34.6 (927)	2.8 (74)	1.8 (48)	7.7 (207)	46.1 (1,235)	2.8 (74)
U.S. Share in Percent/(n)	5.9 (117)	22.4 (446)	4.0 (80)	2.2 (44)	10.6 (210)	48.4 (963)	6.5 (129)

Source: HRS Permissions 2004 and SOEP 2007; Author's calculations