MAX PLANCK INSTITUTE
FOR DEMOGRAPHIC RESEARCH

Konrad-Zuse-Strasse 1 · D-18057 Rostock · Germany · Tel +49 (0) 3 81 20 81 - 0 · Fax +49 (0) 3 81 20 81 - 202 · www.demogr.mpg.de

MPIDR Working Paper WP 2022-035 I December 2022
https://doi.org/10.4054/MPIDR-WP-2022-035

Stable marital histories predict happiness and health across educational groups

Miika Mäki I miika.maki@vaestoliitto.fi
Anna Erika Hägglund I anna.hagglund@utu.fi
Anna Rotkirch I anna.rotkirch@vaestoliitto.fi
Sangita Kulathinal I sangita.kulathinal@helsinki.fi
Mikko Myrskylä I myrskyla@demogr.mpg.de

© **Copyright is held by the authors.**

Working papers of the Max Planck Institute for Demographic Research receive only limited review. Views or opinions expressed in working papers are attributable to the authors and do not necessarily reflect those of the Institute.

Stable marital histories predict happiness and health across educational groups

Miika Mäki[1,2,*], Anna Erika Hägglund[1,3], Anna Rotkirch[1], Sangita Kulathinal[4], and Mikko Myrskylä[2,5]

[1]*Population Research Institute at the Family Federation of Finland*
[2]*Center for Social Data Science and Population Research Unit, University of Helsinki*
[3]*University of Turku*
[4]*Department of Mathematics and Statistics, University of Helsinki*
[5]*Max Planck Institute for Demographic Research*

[*]*Corresponding author: miika.maki@vaestoliitto.fi*
Contributing authors: anna.hagglund@utu.fi, anna.rotkirch@vaestoliitto.fi,sangita.kulathinal@helsinki.fi, myrskyla@demogr.mpg.de

December 7, 2022 10:47am

Abstract Couple relations are a key determinant of mental and physical well-being in old age. However, we do not know how the advantages and disadvantages associated with partnership histories vary between socioeconomic groups. We create relationship history typologies for the cohorts 1945-1957 using the Survey of Health, Ageing, and Retirement in Europe, and examine, for the first time, how relationship histories relate to multiple indicators of well-being by educational attainment. Results show that stable marriages co-occur with higher well-being, compared to single and less stable partnership histories. All educational groups experience clear and similar benefits from stable unions. The adverse outcomes of union dissolution are more pronounced for those with lower education. The larger drawbacks on well-being among the less educated, especially among men, suggest that those with fewer resources suffer more from losing a partner. The findings underscore that current and past romantic relations predict well-being in old age and help policymakers in identifying vulnerable subgroups among the aging population.

Keywords partnership history · cumulative disadvantage · health · quality of life · aging

Introduction

Romantic couple relations are among the most intimate, lasting, and important relationships in our lives and a cornerstone of emotional, social, and economic wellbeing (Wängqvist et al. 2016; Luyckx et al. 2014). Previous research has exhaustively shown that having a partner is positively associated with a multitude of well-being outcomes in later life, such as life satisfaction, quality of life, health, morbidity, and mortality (Wong and Waite 2015; Han et al. 2014; Holt-Lunstad et al. 2008; Coombs 1991; Manzoli et al. 2007; Waite 1995; Wang et al. 2022; Reneflot and Mamelund 2012). Indeed, having a spouse is arguably one of the single most important factors for healthy aging (Wood et al. 2009). At the same time, the proportions of single, divorced, or remarried elderly have increased (Cherlin 2017). To support well-being in old age, it is crucial to identify what types of partnership histories are related to increased vulnerability, and to what extent lacking or losing a partner can be compensated for. In this study, we focus on two such dimensions that have not been studied jointly before: whether particular relationship histories predict well-being and whether the well-being implications of those histories vary by education.

Having a partner as such may not enhance well-being. Both cumulative advantage and disadvantage theories imply that the association between well-being and partnerships depends not only on the current status but also and perhaps in particular on the partnership history (DiPrete and Eirich 2006). Existing literature tends to focus either on single relationship events, such as marriage or divorce, or on static ways of depicting life course events that simplify partnership histories (Sassler 2010; Schütz 2019; Gumà et al. 2014). A handful of studies have created partnership history trajectories to study later life outcomes (Zimmermann and Hameister 2019; Roberson et al. 2018), and O'flaherty et al. (2016) complement the relationship histories with fertility histories.

Several scholars, including Becker (1973), have stressed that the gains from marriage are likely to depend on individual traits, such as attractiveness, intelligence, and education. These different gains may arise because of homogamy, higher marital satisfaction, and more fullfilling family life and ties. A series of studies has investigated how the relationship between marital status and well-being varies by personality traits (Boyce et al. 2016), relationship quality (Ren 1997), ethnicity, or financial situation (Mookherjee 1997). So far, scholars have not considered education in greater detail.

The gains from a partnership might follow an educational gradient. On the one hand, highly-educated individuals might be able to get more out of family life, which requires resources and personal sacrifices. This would suggest a cumulative advantage. On the other hand, those with a lower educational level might rely more heavily on a spouse. This, in turn, would indicate that spousal loss has more detrimental consequences for those with fewer resources, pointing to a cumulative disadvantage. (DiPrete and Eirich 2006) In other words, partnerships could compensate for a lack of other resources.

When examining the association between well-being and partnership status, educational attainment is usually treated as a control rather than a stratifying feature (Boyce et al. 2016; Han et al. 2014; Wong and Waite 2015). To our knowledge, only one study in recent decades has examined whether the association between marital status and well-being indicators varies by education: Øien-Ødegaard et al. (2021) found that low education increased the suicide risk of the separated.

We investigate whether partnership biographies are associated with health and quality of life for men and women and how the associations differ between educational groups of Northern and Western Europeans in third age. Specifically, we are interested in signs of cumulative advantage or disadvantage: does having a certain educational level amplify the benefits or aggravate the

disadvantages of specific trajectories?

Our work contributes to the existing literature on the marriage well-being premium by conceptualizing relationship statuses as trajectories and examining the educational gradient in the association between the trajectories and well-being. Empirically, we create partnership history typologies using data from the Survey of Health, Ageing, and Retirement in Europe (SHARE) from 13 European countries. We measure well-being using multiple indicators, and our analyses control for several confounding measures including childhood conditions, income, and number of children.

Why are relationship status and well-being linked?

The empirical evidence for the interconnectedness of marital status and well-being is conclusive. Current marital status, partnership histories, and the quality of couple relationships are all typically linked to wellbeing. (see review in Wood et al. 2009)

What explains the consistency of these findings? Previous research points to three mechanisms, namely selection into marriage, marriage as a key social role, and the everyday social support of living with a spouse (cf. Dush and Amato 2005; Averett et al. 2013).

First, those with more resources tend to be selected into marriages. This could indicate that it is not marriage itself that makes people happy, but that happy people get married (Koball et al. 2010). While some selection effects are at play (see Goldman 1993 for a theoretical overview), the majority of longitudinal studies suggest that selection alone does not account for all positive effects of relationships on well-being (Horwitz et al. 1996; Wood et al. 2009; Fu and Noguchi 2018; Ginther and Zavodny 2001). Yet not all studies agree (Mastekaasa 1992; Ludwig and Brüderl 2018), highlighting that results may vary with country context and methodological decisions.

Second, the structural symbolic interactionist perspective argues that roles with a high level of commitment result in high levels of identity and self-worth (Stryker & Statham 1985, as cited in Dush and Amato 2005). Internalizing the role of a wife or husband (or parent) shapes both the behavior and self-perception of an individual, and consequently enhances well-being, although this is dependent on their commitment to the given identities (Stryker 1959). The roles of a couple are reproduced in everyday encounters (Goffman 1959; Mead 1934:377) and rewarded by others (Leary 1999). The fact that few wish to live without a long-term romantic partner even in wealthy, individualized, and liberal societies (Kontula 2016; Rotkirch 2020:40-41) demonstrates the high value attached to couple relations.

Although norms are important, it seems plausible that relationship structures as such could impact well-being directly: Diener et al. (2000) studied the relationship between marital status and subjective well-being in 42 countries and found that differences in effect sizes between collectivist and individual cultures were tiny compared with the main effect of marital status. Verbakel (2012) concludes with a similar study design that "normative climate appears to hardly affect well-being gaps between partnership statuses". In line with empirical evidence, we expect the impact of social norms to be similar across our study population.

Third, marriage tends to provide social support and regulation beyond any other relationship form (Ross 1995; Coombs 1991; Scott 2000). Especially in high-income societies, unions are the primary household unit for bread-winning, consumption, and intimacy. Although multi-generational households and communal living are not uncommon, the typical alternative to living with a romantic partner is to live alone, particularly among the aging population (Rindfuss and Vandenheuvel 2022; Becker 1991; Rotkirch 2020). Individuals who are attached to social networks are healthier and live longer (House et al. 1988); those with a spouse have

someone in the same household to share the joys and sorrows of life in the long term, which single adults often lack.

Previous empirical research highlights that the implications of having romantic relationships differ by gender. Partnerships are protective, especially for men (Coombs 1991; Metsä-Simola and Martikainen 2013). Although the gender health gap seems to be narrowing over time (Liu and Umberson 2008), women still avoid behavior that is bad for health more often than men. Women are also more likely to control the health behavior of their partners (Reczek et al. 2016; Umberson 1992; Westmaas et al. 2002; Lewis and Butterfield 2007). Men tend to have smaller and less intimate social networks in later life (Ajrouch et al. 2005). Women tend to suffer more from living in a marriage with low relationship quality (Bulanda et al. 2016; Brown and Wright 2017; Carr and Utz 2020).

Overall, these considerations imply that the benefits of a stable union are expected to be more pronounced for men, while unstable unions should not necessarily have as large of an impact on women. The difference between well-being outcomes is pronounced in studies that examine relationships from a life course perspective for men, but near non-existent for women: O'flaherty et al. (2016) found no physical health outcomes for the partnership histories of women unless their marital history was disrupted and they had many children. Likewise, Zimmermann and Hameister (2019) found only modest evidence that relationship histories are linked with self-assessed mental health and quality of life measures among women. Both authors found relatively strong evidence that the association holds among men.

It seems that studying relationship *histories* could reveal dynamics that are concealed in analyses focusing on relationship *statuses*.

Conceptualizing relationship histories and statuses

Well-being in old age is comprised of the combined experiences over the course of the entire life, not just at the present moment. Studying sequences of relationship statutes informs holistically how romantic relationships have been part of the life course.

Being single, divorced, or widowed is qualitatively quite different from living with a partner. The experience and well-being outcomes of even the unpartnered groups can nevertheless be very different and should thus be treated separately (Næss et al. 2021; Pinquart 2003).

Although cohabitation and marriage are starting to resemble each other both legally and socially (Cherlin 2020; Perelli-Harris and Amos 2015), there is still a clear difference in terms of commitment, longevity, and symbolic importance (Barlow et al. 2001; Cherlin 2004; Rault 2019; Brown and Wright 2017).

Similarly, first and higher-order marriages differ in terms of stability, relationship satisfaction, and demographic make-up (Zahl-Olsen et al. 2019; Hägglund et al. 2021; Booth and Edwards 1992), which is why later life outcomes could be different as well.

Here, we thus categorize partnership statuses into singlehood, first and higher-order marriages, dating, cohabitation, divorce, and widowhood. By partnership history we mean the ordered series of relationship statuses from teenage to old age (cf. Cornwell 2015:21). We use the terms partnership histories and partnership trajectories interchangeably throughout this article.

Cumulative advantage and disadvantage over the life course

The association between partnership histories and well-being may increase with age, since inequalities in health, but also to some extent in subjective well-being, tend to accumulate as individuals age (Kratz and Patzina 2020; Ross and Wu 1996; Prus 2007; Headey 2010). Among

the oldest old, health inequalities seem to converge rather than diverge, but research is not unanimous on the mechanisms (Beckett 2000; Kulminski et al. 2006; Herd 2006). Mehta et al. (2019) suggest that the choice of the measurement scale explains the apparent convergence: on an additive—as opposed to multiplicative—scale, the excess death risk due to behavioral risk factors increased with age. If the inequalities do diverge, they should be further pronounced when multiple domains of life—in our case partnership histories and education—are taken into account (Mirowsky and Ross 2008; Ross and Wu 1996).

The theory of cumulative advantage and disadvantage falls within the larger framework of life course studies (Hutchison 2011) wherein it is thought that events early on can have lasting consequences unto later life. The aging process is a result of accumulated dis/advantages over the years (Melo et al. 2019). Cumulative dis/advantage means that the negative/positive implications of one aspect of life increase over time (Dannefer 2003). One advantage or disadvantage tends to increase the benefit or harm of another (Pampel and Rogers 2004), which is why it is informative to study more than one possible source of dis/advantage. The theory was initially conceptualized by Price (1965) and Merton (1968, 1988), who observed that citations and publications start to accumulate for certain researchers.

Ferraro et al. (2009) outlines possible mechanisms for how the dis/advantages accumulate: disadvantage exposes to risks while advantage exposes to opportunities; perceptions of trajectories could influence subsequent biographies; social environments limit agency, yet resources may help battle structural barriers. Overall, cumulative disadvantage tends to be more prevalent than cumulative advantage (Pampel and Rogers 2004). Moreover, in our operationalization of cumulative dis/advantage, cumulative advantage and disadvantage cannot co-exist: either the benefits (or damages) are relatively greater for the advantageous or the damages (or benefits) are greater for the already vulnerable.

To capture the development of cumulative advantages and disadvantages, it is not enough to look at the present moment or single domains, but rather to study multiple sources of dis/advantages over time. Here we are interested in the interplay of relationship histories with educational attainment.

The accumulation of human, social and personal capital is anchored in educational attainment in adolescence (O'Rand 2001). Education is associated with a multitude of well-being outcomes and is an indicator of social status (see Zajacova and Lawrence 2018 for review). Mirowsky and Ross (2005) argue that this is because education transforms individuals and puts their lives on a different track. Although education is linked to social and hereditary characteristics, it also tends to promote well-being through three main pathways (Ross and Wu 1995): work-related resources, such as low economic hardship and fulfilling full-time jobs; social-psychological resources such as a sense of control and social support; and health behavior.

On the one hand, the highly educated could gain greater benefits from stable relationship histories. Educational attainment reproduces and amplifies the ramifications of social background (Melo et al. 2019). Those in a high socioeconomic position are more likely to partner with similarly positioned individuals (Schartz 2010) and their unions tend to be happier (Tavakol et al. 2017). The benefits of a happy family life, such as fulfilling relationships with kin-network (Roberts and Dunbar 2011) and the joys of raising children, could be more pronounced for those with higher educational attainment (Margolis and Myrskylä 2011). This would suggest further accumulation of well-being.

Alternatively, the social support and internalized roles could benefit the low-educated in particular. As they tend to have fewer resources, they are more reliant on single assets, such as stable partnership histories. Put differently, the highly educated can utilize other social, economic, and psychological resources that buffer the negative consequences of union

dissolution and living alone (Ferraro et al. 2009). This is what Mirowsky and Ross (2005) calls resource substitution: an ability to acquire or invent ways in which to withstand difficulties. According to the resource substitution theory, stable union histories have stronger benefits, or conversely single or fragmented union histories have stronger disadvantages among low-educated individuals, as they have fewer resources of resilience.

Evidence for cumulative advantage in our study would support the selection hypothesis: higher social status would predict success in gaining and retaining a partner, which in turn would lead to further well-being. Results in favor of cumulative disadvantage would, on the contrary, argue for the explanatory powers of symbolic interaction and social support theories: not enjoying the compensatory mechanisms of stable unions would place those who are already vulnerable at a higher risk of adversity. Likewise, the highly educated would not gain equally from internalized roles or social support as education itself provides similar benefits. That said, identifying which mechanism is driving the association between partnership and well-being is challenging with retrospective survey data. While our empirical models took some selection into consideration, it is difficult to distinguish between different pathways, especially between role conformity and social support.

Hypotheses

Based on the previous research outlined above, we hypothesize that (1a) stable marital relationship histories are associated with well-being after age 60. We also predict that (1b) individuals with more unstable relationship histories tend to be less well off. In addition, we expect (1c) more robust and consistent results for men, but possibly also some associations for women.

We expect that the association between partnership histories and well-being will vary by education, but the direction is not clear. If the educational gradient is in line with cumulative advantage, we expect high education to strengthen the positive associations between stable partnership histories and well-being (2a). If cumulative disadvantage occurs, we expect low education to strengthen the negative association between unstable partnership histories and well-being (2b).

Data and methods

Life histories were generated with the help of the SHARELIFE interviews of the Survey of Health, Ageing, and Retirement in Europe (Börsch-Supan and Bergmann 2019)[1]. SHARE is a micro panel data infrastructure that covers households with at least one member aged 50 in all EU countries, Switzerland, and Israel. The survey collects both panel and retrospective life course data. The retrospective SHARELIFE pseudo-panel interviews were conducted in 2008 and 2017 (wave 3 and 7, respectively). Respondents were asked to report, amongst others, on their childhood circumstances as well as their past partners, including all cohabitational, marital, and dating relationships. If the life history interviews were conducted in 2008, any changes in relationship statuses were updated with subsequent panel interview data.

We selected a cohort born between 1945-1957 in Northern and Western Europe that were at least 60 years of age in 2017. By restricting the sample, we reduced the heterogeneity of the study population; by extending the life courses until the verge of retirement, we could study

[1]This paper uses data from SHARE Waves 1, 2, 3, 4, 5, 6, and 7 (DOIs: 10.6103/SHARE.w1.710, 10.6103/SHARE.w2.710, 10.6103/SHARE.w3.710, 10.6103/SHARE.w4.710, 10.6103/SHARE.w5.710, 10.6103/SHARE.w6.710, 10.6103/SHARE.w7.711). See Börsch-Supan et al. (2013) for methodological details.

the association between different relationship trajectories and health. The final sample size for analysis was 18,256 individuals. In order to obtain an adequate sample size, all couples were heterosexual.

The first part of the analyses was creating relationship history typologies that were created by sequence analysis or agglomerative hierarchical clustering (see Cornwell 2015 for a theoretical overview). We first created a distance matrix with the dynamic hamming method. The substitution costs of two states at position p are calculated as follows:

$$\begin{aligned} s_p(A,B) = 4 - \big(&pr(X_p = A|X_{p-1} = B) + pr(X_p = B|X_{p-1} = A) + \\ &pr(X_{p+1} = A|X_p = B) + pr(X_{p+1} = B|X_p = A)\big) \end{aligned} \tag{1}$$

where $s_p(A,B)$ is the substitution cost at position[2] p and X_p is the state[3] at the p^{th} position. The method assesses both the probability of being in state A and state B at position p as well as the transition probabilities from A to B at position p and vice versa. This means that both timing and order are taken into account. (Cornwell 2015:128) Thus the substitution costs are calculated automatically based on how common a certain transition is at a given age, rather than imposing subjective substitution costs that might not reflect reality.

The distance matrix between the individual trajectories was further analyzed using Ward's agglomerative clustering method to form groups (Ward 1963). The clusters are obtained by minimizing the within-cluster sum of squares, and hence produce groups with similar histories. We also experimented with other algorithms but the clustering alternatives with Ward's method made the most sense conceptually.

$$\begin{aligned} \Delta(J,K) &= \sum_{i \in \Lambda \cup B} \|\vec{x}_i - \vec{m}_{J \cup K}\|^2 - \sum_{i \in J} \|\vec{x}_i - \vec{m}_J\|^2 - \sum_{i \in K} \|\vec{x}_i - \vec{m}_K\|^2 \\ &= \frac{n_J n_K}{n_J + n_K} \|\vec{m}_J - \vec{m}_K\|^2 , \end{aligned} \tag{2}$$

where Δ is the merging cost of arbitrary clusters J and K, and $\vec{m}_J$,$\vec{m}_K$,$\vec{x}_i$ are the centers of individual and combined clusters. If there are n clusters at a given point of the process, $\binom{n}{2}$ distances are calculated and the clusters with the smallest distance d are merged. (Kaufman and Rousseeuw 1990:231)

We performed goodness-of-fit tests to decide how many clusters to choose: Average Silhouette Width (ASW) indicates high between-group dissimilarity and high within-group similarity; Hubert's Gamma (HG) measures the capacity of the clusters to reproduce the distances (Studer 2013). In addition, we corroborated the test statistics by inspecting the clustering trees visually.

Initially, we added a second sequence channel with offspring histories, but the clusters depended almost entirely on the completed number of children—regardless of which algorithm we used. Since we do not focus on the associations between childbearing and parenting here, we dropped the children channel and added the number of children as a control variable for our third and sixth models.

The typologies were created jointly for men and women for two reasons. First, we wanted to compare differences in well-being outcomes by gender, and having the same typologies for both groups made the comparison easier. Second, the relationship histories of men and women are interrelated by definition.

Health was measured by a subjective health question[4] and well-being by self-reported life

[2] ages 15 to 60

[3] singlehood, first marriages, higher-order marriages, dating, cohabitation, divorce, or widowhood

[4] "Would you say your health is... 1. Excellent, 2. Very good, 3. Good, 4. Fair, 5. Poor"

satisfaction[5], as they are direct and established ways to estimate well-being (Fischer 2009; Jenkinson 2013).

Robustness checks were carried out with grip strength—an objective estimator for health that predicts a multitude of advantageous active aging outcomes (Bohannon 2019)—and CASP-12, an old age quality-of-life indicator with robust theoretical underpinnings[6] (Borrat-Besson et al. 2015). All well-being variables were measured at the most recent interview with the respondent, but no later than in 2017 (wave 7).

We treated subjective health and life satisfaction as continuous rather than ordinal to preserve comparability with Grip Strength and CASP-12. For the same reason, we standardized all continuous and ordinal variables. As Agresti (2015:214-215) points out, using OLS for ordinal response variables can lead to misleading results because of ceiling and floor effects. Consequently, we performed robustness checks with ordinal regression to ensure that such effects were not present.

We analyzed the associations between partnership histories and later life outcomes with six linear regression models. The first model had relationship clusters as independent variables, but did not have any controls other than age. In the second model, control variables that were exogenous to the clusters themselves were added to model 1: family composition at 10 years of age, and childhood socioeconomic background measured by the number of books, features, and rooms at home, and whether the respondent experienced hunger as a minor (see Havari and Mazzonna (2015) for a discussion about the reliability of these measures). The third model was an over-controlled one: it made sure that the cluster associations were not merely artifacts of the number of children, educational attainment, or income. For models 4, 5, and 6, we added interactions between educational attainment and the clusters. Otherwise they were identical to models 1, 2, and 3, respectively.

Missing values (please refer to Table 2 and Table 1) were handled with multiple imputation with 6 imputed datasets.

To further analyze the robustness of the associations, we examined how an unmeasured confounder would alter our results for the first three models. To do so, we computed an E-value (VanderWeele and Ding 2017) that approximates how strong an unmeasured confounder associated with both the independent and dependent, conditional on the covariates, would have to be in order to explain away their relationship. It does not make any assumptions about the confounder. However, it is no more conservative than other often used sensitivity analyses and it is straightforward to implement. (Ding and VanderWeele 2016)

E-value is calculated as:

$$\begin{aligned} E-value &= RR + \sqrt{RR \cdot (RR-1)} \quad if RR \geq 1 \\ &= RR' + \sqrt{RR' \cdot (RR'-1)} \quad if RR < 1 \end{aligned} \tag{3}$$

where RR stands for risk ratio and RR' its inverse $1/RR$. Before that, the estimates of linear regression are transformed to the risk ratio scale. The transformation takes into account effect sizes and standard errors:

[5] "On a scale from 0 to 10 where 0 means completely dissatisfied and 10 means completely satisfied, how satisfied are you with your life?"

[6] The SHARE version of CASP-12 includes 12 statements on control, autonomy, pleasure, and self-realization: My age prevents me from doing the things I would like to do; I feel that what happens to me is out of my control; I feel left out of things; I can do the things I want to do; Family responsibilities prevent me from doing the things I want to do; Shortage of money stops me from doing things I want to do; I look forward to each day; I feel that my life has meaning; On balance, I look back on my life with a sense of happiness; I feel full of energy these days; I feel that life is full of opportunities; I feel that the future looks good for me.

$$
\begin{aligned}
RR &\approx exp\{0.91 \cdot d\} \\
CI &\approx exp\{0.91 \cdot d \pm 1.78 \cdot se\}
\end{aligned}
\tag{4}
$$

where d is the standardized effect size and se the standard error of d (VanderWeele and Ding 2017). The approximation relies on assumptions from meta-analyses to convert standardized effect sizes into odds ratios and further the obtained odds ratios into risk ratios (VanderWeele 2017; Hasselblad and Hedges 1995; Borenstein et al. 2021). Note that by definition, E-value equals one if the upper and lower confidence bounds of the corresponding risk ratios are under and above one, respectively. This becomes evident when we look at the definition in Equation 3: if the confidence bounds of the E-values crossed one, the interpretation of the upper/lower tail would become meaningless.

All analyses were conducted with the Puhti supercomputer R singularity container (CSC 2021; R Core Team 2021): Sequence analyses and clustering trees with Graphviz and the R package TraMineR (Gabadinho et al. 2011; Gansner and North 2000); all other visualizations with ggplot2 and jtools (Wickham 2016; Long 2020); multiple imputations with mice (van Buuren and Groothuis-Oudshoorn 2011); unmeasured confounding with EValue (VanderWeele and Ding 2017); interaction forecasting with emmeans (Lenth 2021), and tables with table1 and stargazer (Rich 2021; Hlavac 2018).

Results

Taken together, our analyses identified five relationship history typologies, demonstrated that stable union trajectories had the best well-being associations and were similar across all educational groups, and that low education appeared to aggravate the well-being associations of trajectories characterized by divorce without remarriage.

Table 1 displays the descriptives of the regression covariates and an overview of the prevalence of relationship statuses between ages 15 and 60. The higher educated tend to have better well-being outcomes in later life and are more attached to romantic relationships.

Partnership typologies

We start by describing the relationship trajectories. Our analyses identified five distinct types of relationship trajectories. This five-cluster solution (Figure 1 & Figure A.4) was the most optimal according to both goodness-of-fit tests and visual inspection (Figure A.1 and Figure A.2). The *marriage* (1) cluster is characterized by a brief period of dating—and sometimes cohabitation—followed by a permanent first marriage, usually starting in the late 20s. The *remarriage* (2) cluster tended to marry around their 20s and divorce within the first ten years of marriage. Most would remarry in their 30s. The higher-order marriages were often preceded by cohabitation. The *union dissolution* (3) cluster is identical to the first two clusters until the mid-20s. However, unlike the remarriage cluster (2), people remained single or widowed, or started dating or cohabiting after divorce, but did not generally remarry. In the *serial cohabitation* (4) cluster, cohabiting and dating were prominent throughout the life course. Marriages, in turn, were rare, and usually ended in divorce. There was a considerable amount of variation in the relationship stages after the initial period of singlehood. The sequence index plot (see Figure A.4) reveals that this cluster was, indeed, characterized by serial as opposed to stable cohabitation. Finally, the vast majority in the *single* (5) cluster never dated or co-resided. Those who did, by and large, returned to singlehood in a few years.

Table 1: Descriptive Statistics by Gender and Education

	Male			Female		
ă	Higher	Secondary	Basic	Higher	Secondary	Basic
	(N=3171)	(N=3226)	(N=1738)	(N=3833)	(N=3735)	(N=2371)
Subjective health						
Mean (SD)	3.1 (1.1)	2.8 (1.0)	2.7 (1.0)	3.0 (1.0)	2.8 (1.0)	2.7 (1.0)
Missing	10 (0.3%)	13 (0.4%)	4 (0.2%)	6 (0.2%)	4 (0.1%)	4 (0.2%)
Life satisfaction						
Mean (SD)	8.1 (1.5)	7.8 (1.7)	7.6 (1.8)	7.9 (1.6)	7.7 (1.8)	7.7 (1.8)
Missing	69 (2.2%)	106 (3.3%)	55 (3.2%)	56 (1.5%)	52 (1.4%)	45 (1.9%)
Grip strength						
Mean (SD)	45.6 (8.4)	45.2 (8.6)	43.8 (9.0)	28.4 (5.7)	27.7 (6.0)	26.8 (5.9)
Missing	46 (1.5%)	45 (1.4%)	28 (1.6%)	53 (1.4%)	49 (1.3%)	45 (1.9%)
CASP-12						
Mean (SD)	40.1 (5.2)	39.2 (5.8)	37.8 (6.2)	39.5 (5.6)	38.6 (6.0)	37.9 (6.5)
Missing	44 (1.4%)	51 (1.6%)	45 (2.6%)	60 (1.6%)	43 (1.2%)	32 (1.3%)
No. of rooms (aet. 10)						
Mean (SD)	4.4 (2.5)	3.9 (1.9)	3.9 (1.7)	4.1 (2.2)	3.8 (1.8)	3.9 (1.8)
Missing	144 (4.5%)	163 (5.1%)	69 (4.0%)	201 (5.2%)	157 (4.2%)	88 (3.7%)
No. of features at home (aet. 10)						
Mean (SD)	3.2 (1.8)	2.5 (1.9)	2.1 (1.8)	3.0 (1.9)	2.5 (1.9)	2.1 (1.7)
Missing	17 (0.5%)	20 (0.6%)	14 (0.8%)	15 (0.4%)	13 (0.3%)	8 (0.3%)
No. of books at home (aet. 10)						
None or very few	410 (12.9 %)	937 (29.0 %)	777 (44.7 %)	425 (11.1 %)	973 (26.1 %)	1062 (44.8 %)
One shelf (11-25 books)	670 (21.1 %)	925 (28.7 %)	437 (25.1 %)	757 (19.7 %)	1076 (28.8 %)	635 (26.8 %)
One bookcase (26-100 books)	1114 (35.1 %)	876 (27.2 %)	359 (20.7 %)	1418 (37.0 %)	1081 (28.9 %)	445 (18.8 %)
Two bookcases (101-200 books)	435 (13.7 %)	226 (7.0 %)	81 (4.7 %)	565 (14.7 %)	305 (8.2 %)	105 (4.4 %)
More than two bookcases	517 (16.3 %)	201 (6.2 %)	50 (2.9 %)	641 (16.7 %)	242 (6.5 %)	79 (3.3 %)
Missing	25 (0.8%)	61 (1.9%)	34 (2.0%)	27 (0.7%)	58 (1.6%)	45 (1.9%)
Living with parents (aet. 10)						
Yes	2861 (90.2 %)	2793 (86.6 %)	1449 (83.4 %)	3336 (87.0 %)	3195 (85.5 %)	2029 (85.6 %)
No	289 (9.1 %)	396 (12.3 %)	268 (15.4 %)	457 (11.9 %)	517 (13.8 %)	319 (13.5 %)
Missing	21 (0.7%)	37 (1.1%)	21 (1.2%)	40 (1.0%)	23 (0.6%)	23 (1.0%)
Hunger in childhood						
No	3090 (97.4 %)	3109 (96.4 %)	1674 (96.3 %)	3769 (98.3 %)	3646 (97.6 %)	2304 (97.2 %)
Yes	35 (1.1 %)	46 (1.4 %)	33 (1.9 %)	39 (1.0 %)	60 (1.6 %)	50 (2.1 %)
Missing	46 (1.5%)	71 (2.2%)	31 (1.8%)	25 (0.7%)	29 (0.8%)	17 (0.7%)
Number of children						
2+	2253 (71.1 %)	2171 (67.3 %)	1134 (65.2 %)	2699 (70.4 %)	2592 (69.4 %)	1714 (72.3 %)
1	488 (15.4 %)	592 (18.4 %)	308 (17.7 %)	703 (18.3 %)	790 (21.2 %)	437 (18.4 %)
0	430 (13.6 %)	463 (14.4 %)	296 (17.0 %)	431 (11.2 %)	353 (9.5 %)	220 (9.3 %)
Ever married						
Yes	2931 (92.4 %)	2920 (90.5 %)	1489 (85.7 %)	3478 (90.7 %)	3477 (93.1 %)	2189 (92.3 %)
No	240 (7.6 %)	306 (9.5 %)	249 (14.3 %)	355 (9.3 %)	258 (6.9 %)	182 (7.7 %)
Ever divorced						
Yes	471 (14.9 %)	502 (15.6 %)	264 (15.2 %)	749 (19.5 %)	732 (19.6 %)	395 (16.7 %)
No	2700 (85.1 %)	2724 (84.4 %)	1474 (84.8 %)	3084 (80.5 %)	3003 (80.4 %)	1976 (83.3 %)
Ever cohabited						
Yes	1490 (47.0 %)	1399 (43.4 %)	696 (40.0 %)	1769 (46.2 %)	1479 (39.6 %)	797 (33.6 %)
No	1681 (53.0 %)	1827 (56.6 %)	1042 (60.0 %)	2064 (53.8 %)	2256 (60.4 %)	1574 (66.4 %)

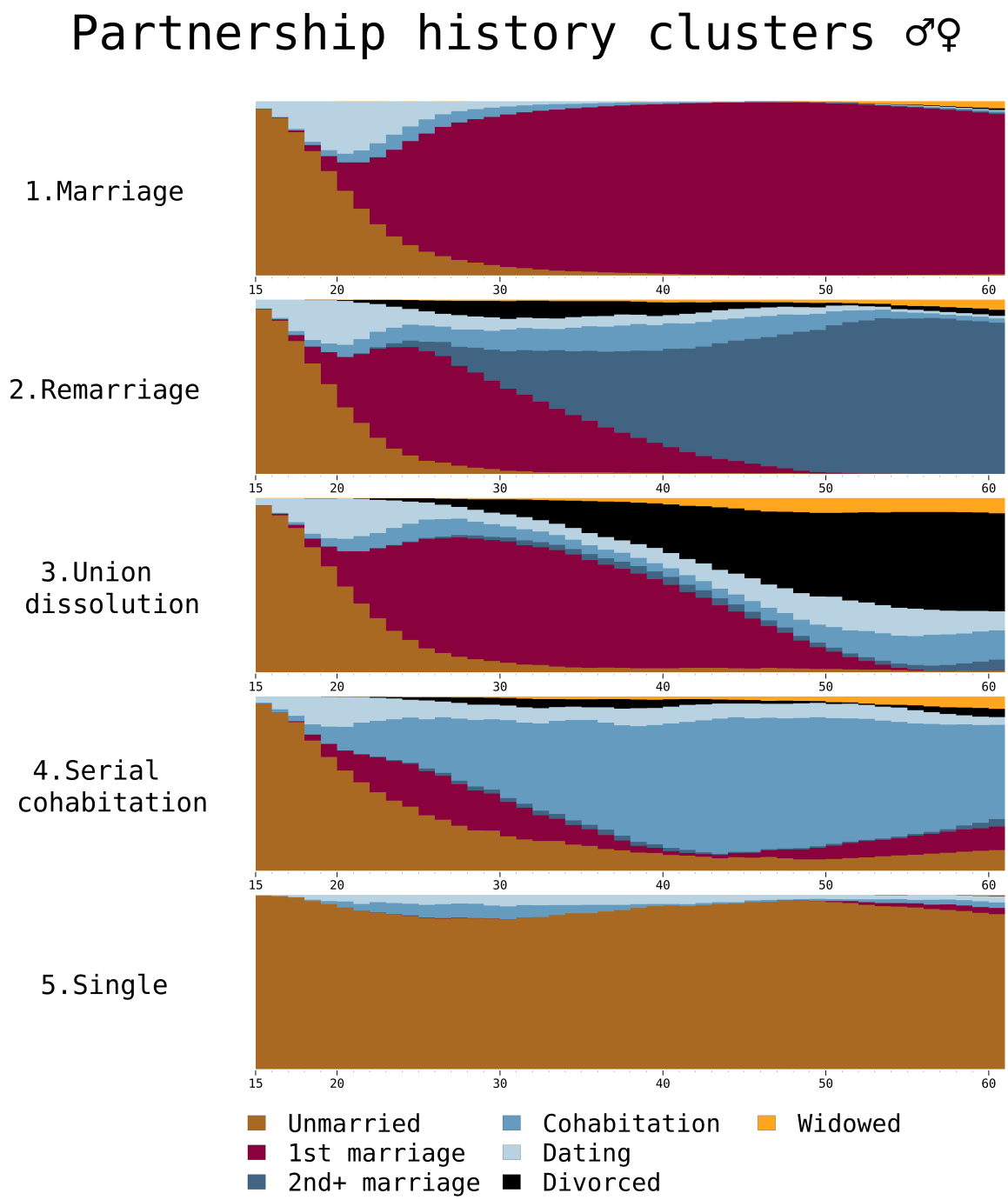


Fig. 1: Partnership history clusters for Western and Northern Europeans born in 1945 - 1957 at the age of 15 - 60

Table 2: Descriptive Statistics by Cluster

ă	1	2	3	4	5	Overall
	(N=11863)	(N=1962)	(N=2169)	(N=1307)	(N=955)	(N=18256)
Year of birth						
Mean (SD)	1950.6 (3.6)	1950.6 (3.6)	1951.0 (3.6)	1951.5 (3.6)	1950.8 (3.7)	1950.7 (3.6)
Gender						
Male	5487 (46.3 %)	882 (45.0 %)	759 (35.0 %)	596 (45.6 %)	509 (53.3 %)	8233 (45.1 %)
Female	6376 (53.7 %)	1080 (55.0 %)	1410 (65.0 %)	711 (54.4 %)	446 (46.7 %)	10023 (54.9 %)
Education						
Higher	4575 (38.6 %)	754 (38.4 %)	838 (38.6 %)	500 (38.3 %)	337 (35.3 %)	7004 (38.4 %)
Secondary	4505 (38.0 %)	815 (41.5 %)	838 (38.6 %)	487 (37.3 %)	316 (33.1 %)	6961 (38.1 %)
Basic	2669 (22.5 %)	383 (19.5 %)	476 (21.9 %)	306 (23.4 %)	275 (28.8 %)	4109 (22.5 %)
Missing	114 (1.0%)	10 (0.5%)	17 (0.8%)	14 (1.1%)	27 (2.8%)	182 (1.0%)
Income						
Mean (SD)	2687.6 (14582.9)	2613.0 (15783.4)	2585.1 (7691.3)	2562.4 (5889.4)	2173.8 (3793.2)	2631.0 (13220.0)
Missing	763 (6.4%)	86 (4.4%)	76 (3.5%)	72 (5.5%)	51 (5.3%)	1048 (5.7%)
Country						
Austria	981 (8.3 %)	147 (7.5 %)	212 (9.8 %)	105 (8.0 %)	78 (8.2 %)	1523 (8.3 %)
Belgium	1605 (13.5 %)	237 (12.1 %)	351 (16.2 %)	156 (11.9 %)	126 (13.2 %)	2475 (13.6 %)
Denmark	1056 (8.9 %)	220 (11.2 %)	161 (7.4 %)	176 (13.5 %)	62 (6.5 %)	1675 (9.2 %)
Estonia	1257 (10.6 %)	290 (14.8 %)	237 (10.9 %)	173 (13.2 %)	117 (12.3 %)	2074 (11.4 %)
Finland	609 (5.1 %)	74 (3.8 %)	87 (4.0 %)	87 (6.7 %)	46 (4.8 %)	903 (4.9 %)
France	1251 (10.5 %)	155 (7.9 %)	233 (10.7 %)	138 (10.6 %)	108 (11.3 %)	1885 (10.3 %)
Germany	1352 (11.4 %)	271 (13.8 %)	148 (6.8 %)	76 (5.8 %)	72 (7.5 %)	1919 (10.5 %)
Latvia	402 (3.4 %)	83 (4.2 %)	104 (4.8 %)	32 (2.4 %)	41 (4.3 %)	662 (3.6 %)
Lithuania	518 (4.4 %)	75 (3.8 %)	108 (5.0 %)	25 (1.9 %)	31 (3.2 %)	757 (4.1 %)
Luxembourg	479 (4.0 %)	46 (2.3 %)	57 (2.6 %)	14 (1.1 %)	30 (3.1 %)	626 (3.4 %)
Netherlands	573 (4.8 %)	58 (3.0 %)	70 (3.2 %)	21 (1.6 %)	65 (6.8 %)	787 (4.3 %)
Sweden	987 (8.3 %)	166 (8.5 %)	212 (9.8 %)	219 (16.8 %)	99 (10.4 %)	1683 (9.2 %)
Switzerland	793 (6.7 %)	140 (7.1 %)	189 (8.7 %)	85 (6.5 %)	80 (8.4 %)	1287 (7.0 %)

Overall, the clusters resemble each other in demographic characteristics (see Table 2), although there are a few exceptions: men were over-represented in the singlehood (5) and women in the union dissolution (3) cluster. While educational differences were generally insubstantial, men with stable relationship trajectories tended to be more educated. For women, the opposite pattern prevailed (see Figure 2). The distribution of relationship clusters did not vary much across countries. One stable union trajectories were by far the most common, and single or serial cohabitation trajectories were the rarest. Further inspection by multinomial regression revealed that northern European respondents were more likely to belong to the serial cohabitation cluster. No other clear patterns were observed (see Table A.1 and Figure A.3).

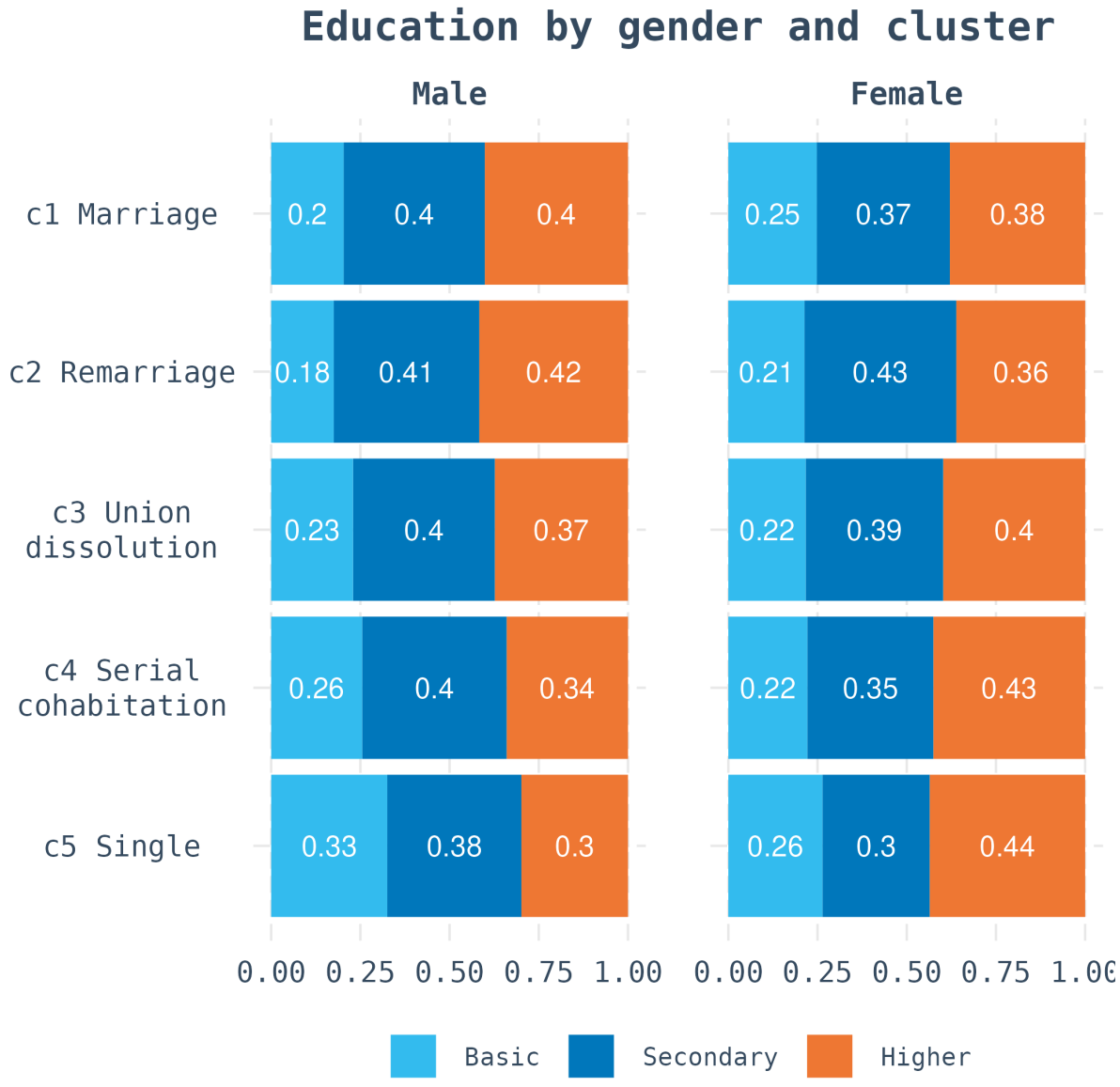


Fig. 2: Educational attainment by gender and partnership trajectory

Well-being outcomes

Next, we analyze the association between partnership histories and well-being. The results for main effects (models 1-3) are depicted in Figure 3, where the marriage (1) cluster is our

reference category. As all non-binary variables were standardized, an effect size of one would imply a difference of one standard deviation in the response variable compared with the reference category. The white circles and squares represent point estimates, while the thick and narrow bars the 95% and 99% confidence intervals, respectively. Overall, the results confirmed that trajectories characterized by stable unions (cluster 1) were associated with higher subjective health and higher life satisfaction for men and women. Clusters characterized by singlehood (5) and union dissolution (3), in turn, seemed to be the most vulnerable to lower well-being in old age. Remarriage (2) was not associated with substantial losses in well-being. Specifically, the well-being of men in this cluster was only slightly worse when compared to that of men with one stable union. For women, differences in effect sizes were larger but still modest. These patterns remained after exogenous controls (model 2) and even in the over-controlled model (model 3). (for full models, see A.2, A.3, A.4, and A.5.

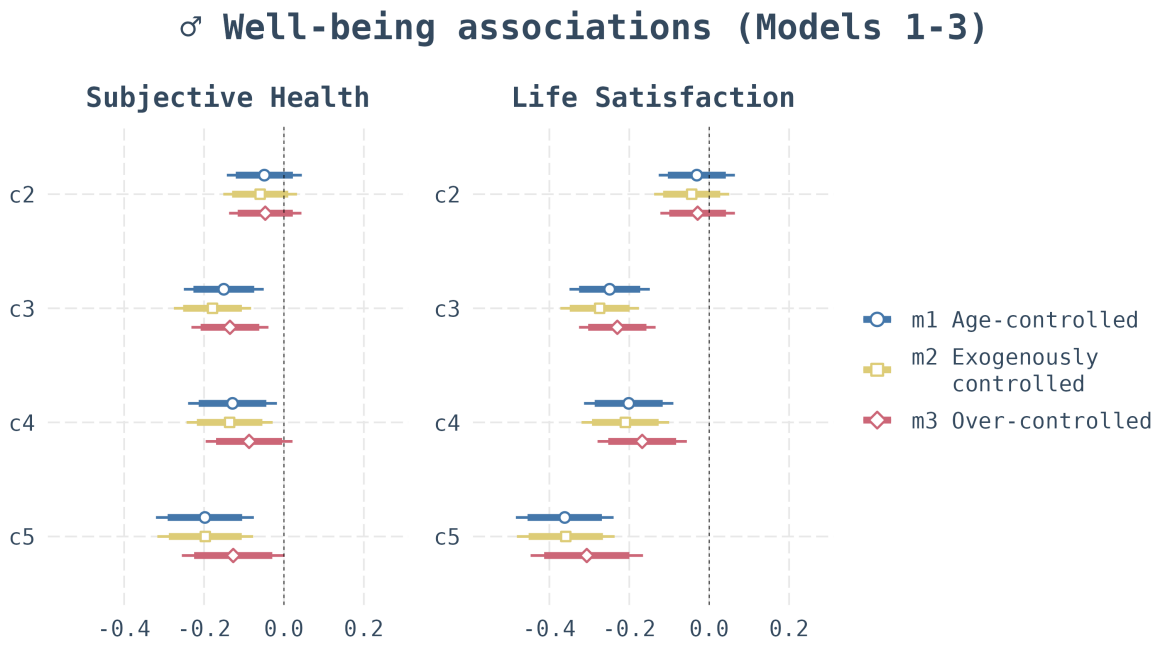
Overall, the general pattern was similar for both sexes with subjective health and life satisfaction, but, as we will see, robustness checks with alternative well-being measures revealed that the associations seemed to hold more consistently for men (findings described in greater detail below and in Figure A.5).

Finally, we assess whether the association between well-being and partnership is contingent on education. Figure 4, Figure A.6, and Figure A.7 display the *predicted values* of all education and cluster combinations by gender conditional on the respective controls. Our results point to an educational gradient in line with cumulative disadvantage. The negative relationship between the divorce cluster and subjective health and life satisfaction was stronger among the basic and secondary educated for both men and women. Correspondingly, higher education seemed to shield both men and women from the possible adverse effects of union dissolution. In other words, those with basic and secondary education were considerably worse off if they had divorced and remained unmarried. These trends were most prominent in model 4, which controlled for age. The patterns remained throughout models 5 and 6, although not as clearly. We believe that this is due chiefly to sample size reduction: it is not so much the smaller difference in point estimates but the wider confidence intervals that seem to dispel the patterns as more controls are introduced. This should not surprise us: as Gelman (2018) has demonstrated, one would need as much as 16 times more data to estimate interaction effect than the main effect.

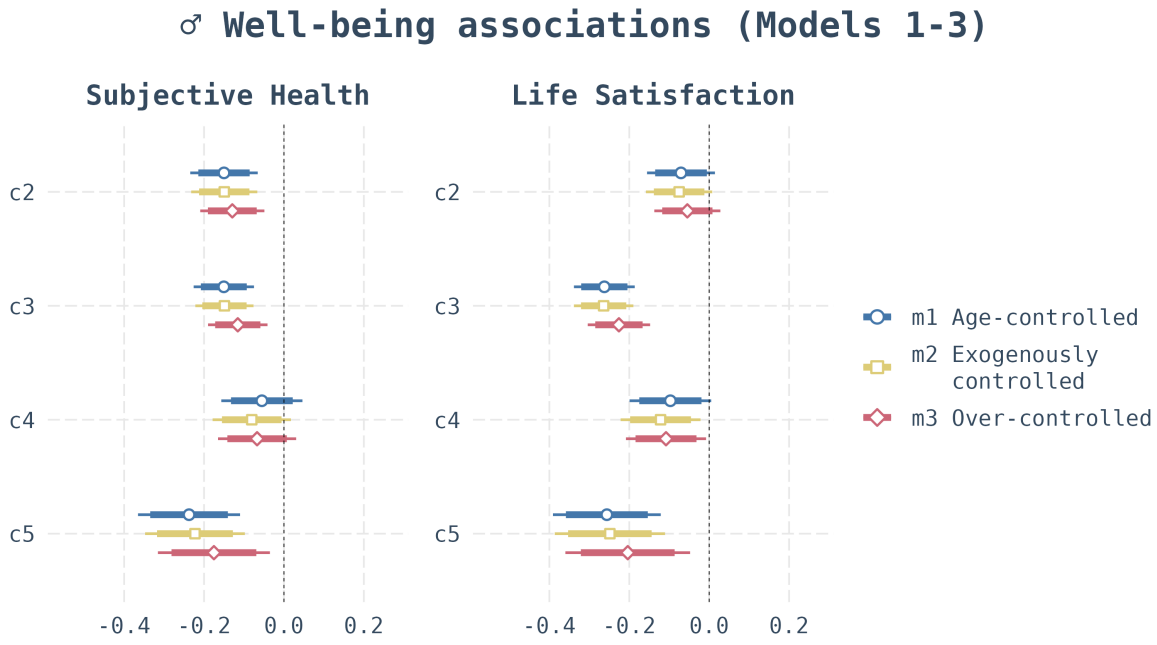
The findings also point out that patterns are more complex than theoretically assumed. In contrast to union dissolution, the negative implications of singlehood are not more pronounced among those with basic or secondary education. Although the singlehood cluster (5) had the lowest well-being outcomes and stable marriages (1) the highest, the educational gradient was constant within both clusters. The educational gradient also seems to vary by gender: while serial cohabitation (4) was disadvantageous for all men, the association varied among women by education. Highly educated women with serial cohabitation fared best out of all groups. Those with basic or secondary education seemed to experience equally negative well-being implications from their complex partnership histories as those in the permanent singlehood (5) cluster.

Robustness checks

The results were similar when measured with grip strength and CASP-12 (Figure A.5, Figure A.8). Grip strength deviated from other response variables: effect sizes were larger for men and smaller for women, for whom the effect sizes were almost zero. The direction of the association was mostly as expected. Still, the near disappearance of association in grip strength implies that the relationship between partnership and well-being, or health, is more robust for



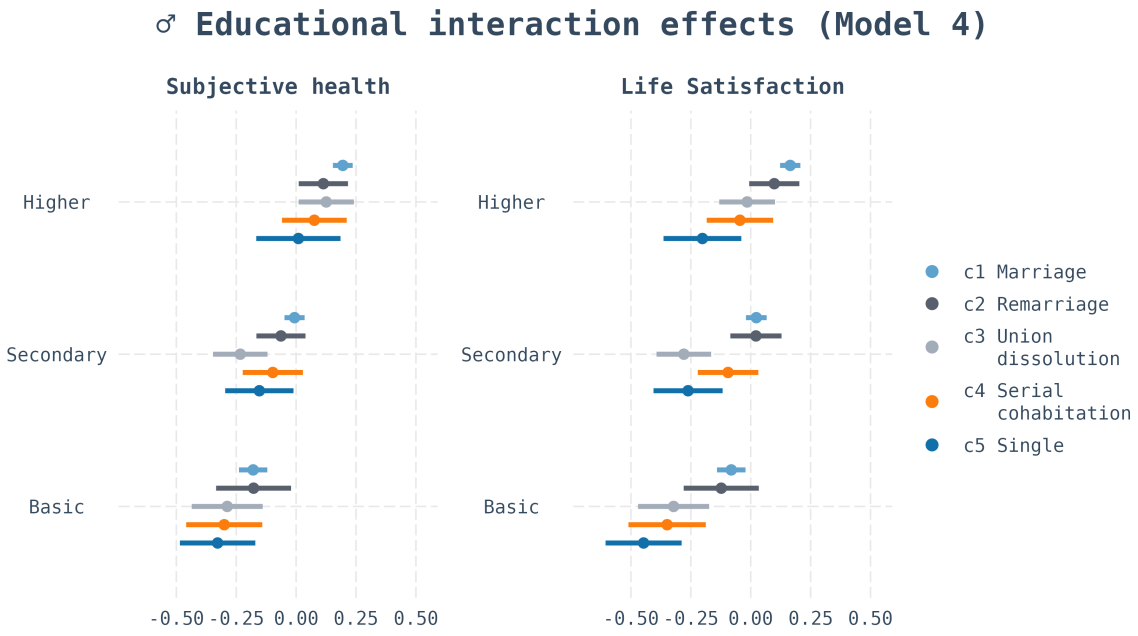
(a) Men



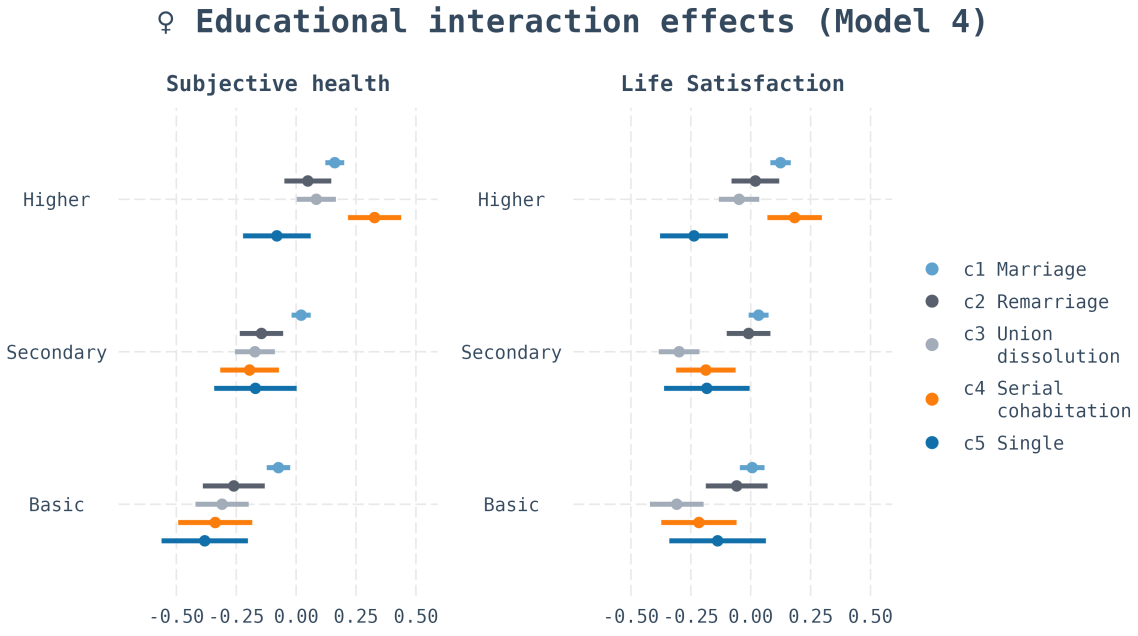
(b) Women

Fig. 3: Linear regression for Subjective Health and Life Satisfaction without interaction effects (Models 1,2 & 3))

Note: Marriage (c1) is the reference category. Other categories are Remarriage (c2), Union dissolution (c3), Serial cohabitation (c4), and Single (c5).



(a) Men



(b) Women

Fig. 4: Linear regression for Subjective Health and Life Satisfaction with educational interaction effects (Model 4)

men.

As subjective health and life satisfaction were measured on 5- and 11-point scales, we also estimated each model using ordinal regression. The results were in line with the OLS (results omitted for brevity).

Estimating how an unobserved confounder would change the associations further corroborated our findings. The E-values in Figure 5 are mainly around 1.5 and 2, meaning that, on the risk ratio scale, an unmeasured confounder associated both with partnership histories and later life outcomes would have to have a 1.5 to 2.0–fold effect in order to explain away the association. The remarriage (2) cluster for men and serial cohabitation (4) cluster for the subjective health of women is an exception: even a small confounder would be enough to nullify the findings. In other words, the associations are somewhat robust for the divorce (3) and single (5) groups for both sexes, for remarriage (2) group among women, and serial cohabitation (4) group among men. For women, the robustness of serial cohabitors is debatable.

In sum, the results were mainly corroborated with alternative response variables; ordinal regression produced similar results, and sensitivity analysis revealed that the associations were rather resistant to potential unmeasured confounding, especially in clusters with extensive periods without a partner.

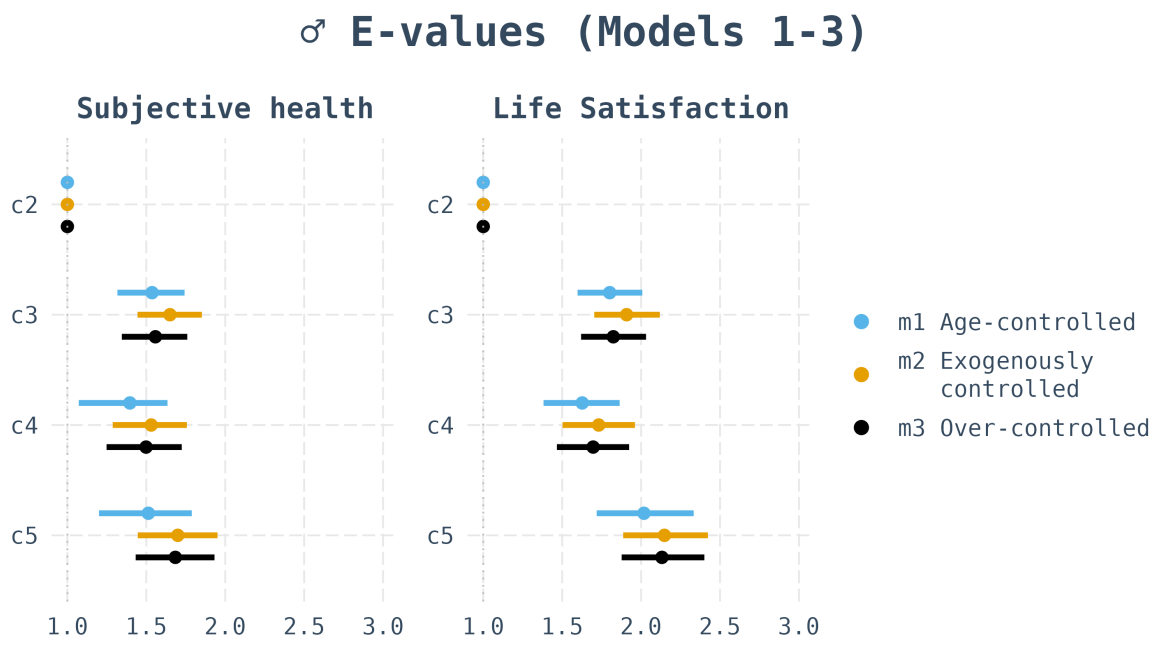
Discussion and conclusion

We investigated, for the first time, how partnership histories are associated with health and quality of life in old age by educational groups. Our findings show that stable relationship histories are steadily associated with well-being in old age across all educational groups. Interaction analyses further indicate that lower education aggravates the negative consequences of trajectories characterized by divorce without remarriage.

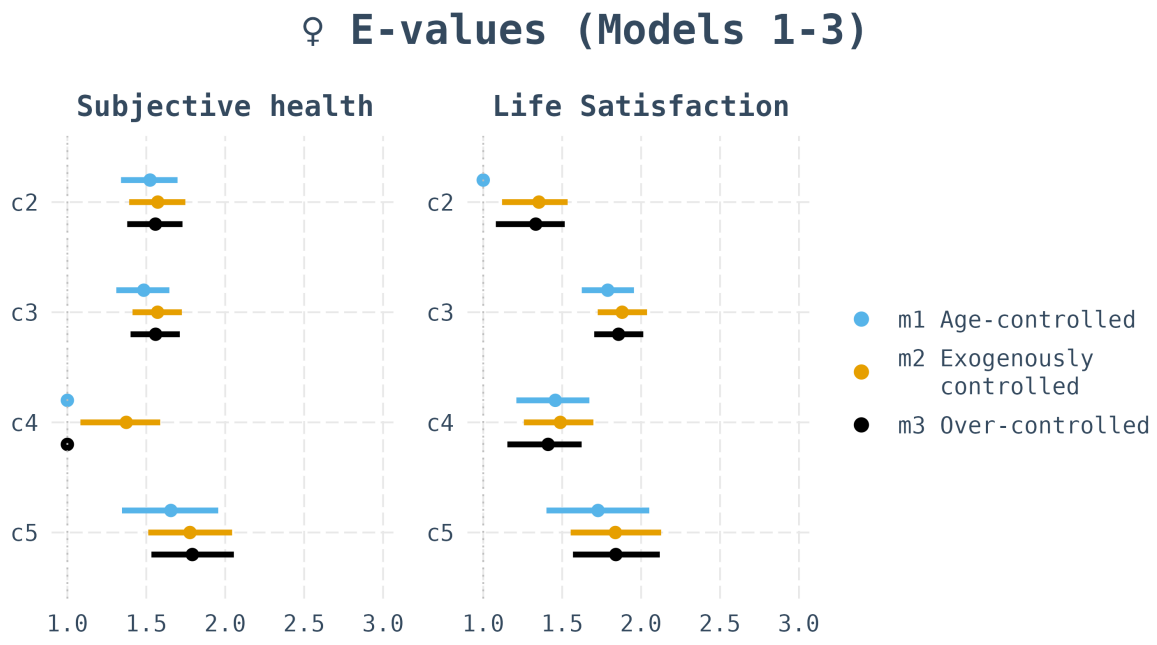
Our first set of hypotheses was mainly confirmed: histories with one stable union were associated with better well-being outcomes (1a). The general trend was that the less attached individuals were from one stable union, the less happy and healthy they were, with life-long singles faring the worst (1b). Thus, in contrast to studies using more crude measures of relationship histories and health (see e.g. Gumà et al. 2014), our findings lend support for the associations between different partnership typologies and well-being. The findings also provided a more nuanced view on those in partnerships: stable second or higher-order marriages did not consistently seem to lower well-being, although the direction of the association was as expected. This finding differs from previous research (Zahl-Olsen et al. 2019; Booth and Edwards 1992) that provided a starker difference between trajectories characterized by remarriages and those of first marriages.

Our findings also showed that patterns were similar for men and women, although we found no robust associations in grip strength for women (1c). Still, our results imply more clearly than previous research that relationship histories are linked to self-assessed health and quality of life measures for women as well (Zimmermann and Hameister 2019; O'flaherty et al. 2016). This suggests that in order to discern how health, happiness, and partnership histories interplay, one may have to wait as long as until the verge of retirement for the association to become visible. Our findings also highlight that the choice of typologies and measurements of well-being matter.

One substantial contribution of the paper was its differentiation between cumulative advantage and disadvantage. The results are more in line with the latter in that lower education seems to strengthen the negative well-being associations of unstable trajectories (2b), although the models with more control variables would have benefited from a larger sample size. High education, in turn, did not seem to provide any further advantage to those with stable relationship histories



(a) Men



(b) Women

Fig. 5: E-values to estimate the magnitude that an unmeasured confounder would have to have in order to explain away the association.

Note: Marriage (c1) is the reference category. Other categories are Remarriage (c2), Union dissolution (c3), Serial cohabitation (c4), and Single (c5).

(2a). As suggested by Ferraro et al. (2009), the impact of cumulative disadvantage seems indeed to be a greater force than cumulative advantage. The even distribution of educational attainment across the clusters made it meaningful to study the interaction effects as education did not determine the relationship history pattern.

Greater resource substitution among the highly educated is likely to explain why our results are in line with cumulative disadvantage: highly educated individuals are less dependent on partnership history, indicating that stable trajectories will not give the highly educated an additional well-being premium. This suggests that the highly educated are also less vulnerable to unstable partnership trajectories (Mirowsky and Ross 2005). Conversely, our results signal that those with fewer resources have inferior opportunities to compensate for life course events that potentially hamper well-being. Surprisingly, however, the educational gradient was not present in singlehood: spending a life without romantic relationships seemed to affect all education groups with the same magnitude. This could be explained by the fact that divorce rapidly changes life circumstances, after which one needs resources to recover. Permanent singlehood, while associated with the lowest well-being outcomes, is not an instantaneous shock, which could explain why education does not magnify the association.

In terms of mechanisms, the evidence for cumulative disadvantage supports the theories of symbolic interactionism and social support: the low-educated benefit more from internalized roles and increased social regulation as the same mechanisms are associated with education itself. Similarly, a lack of evidence for cumulative advantage would appear to speak against the selection hypothesis (Merton 1968; Dickens and Flynn 2001).

Our hypotheses did not predict that highly educated women would benefit from serial cohabitation above any other relationship history typology. It is possible that women in our study cohort who moved from one cohabitational spell to another were a distinct group with resources and characteristics different from the general population. As associations did not fully disappear after controls, it is equally possible that the mechanisms between serial cohabitation and well-being could be different for highly educated women.

A pseudo panel has the unfortunate feature of excluding the most vulnerable population. Not only are those who are better off and in relationships more likely to participate, but those who have passed away are excluded by design. As a result, the cumulative disadvantages that we observed here are most likely to be stronger in reality (cf. axiom 5 in Ferraro et al. 2009). Although we did measure the effect of an unmeasured confounder, it would have been easier to identify any confounders if the panel was not retrospective. Unmeasured traits could have included, for instance, relationship quality, personal characteristics, contentment with relations with own children and near kin, and mutual friends.

We chose to aggregate our analysis for Western and Northern Europe as we were interested in the general associations of union histories as opposed to country interaction effects. While the current literature does not support the hypothesis that the contribution of relationship status (or histories) would have notable cross-national variation (Diener et al. 2000; Verbakel 2012) and we found no distinct patterns in the country distributions per cluster, it is still possible that some intriguing between-country variations were lost in the analysis.

The results are in line with the consensus from earlier research focusing on current relationship status: stable first marriages are associated with a range of well-being outcomes (Demo and Acock 1996; Kim and McKenry 2002). Our findings reinforce the idea that differences in well-being diverge with age (Kuh et al. 2003; Monnat and Chandler 2015).

Future research could attempt to replicate whether the results hold for younger cohorts. An interesting question is whether the association is chiefly due to the benefits of the stable relationship histories themselves, or whether social life, sanctions, and internalized roles will

play out differently for the cohorts that have entered the marriage market in the 21st century, and if that will have changes in the benefits of stable long marriages. On the one hand, both selection into unions and inequalities of health have increased with education over the past decades (Meara et al. 2008; Corti and Scherer 2021), which would predict the increase of the well-being premium in the future. On the other hand, family life patterns and ideals have transformed since the mid and late 20th century (Lesthaeghe and van de Kaa 1986). This could imply that leading a non-traditional family life course might not have the same social implications as before, and the differences in well-being outcomes could converge.

In addition to studying younger cohorts, qualitative inquiries could further investigate the mechanisms behind the associations, such as the role of children, social networks, or financial support. Register studies could dig deeper into the combined effect of education, the number of children, and other demographic characteristics, and shed more light on the causal mechanisms. More generally, a larger sample size would be ideal for models including interaction effects (Gelman 2018).

We conclude that life courses characterized by stable marriages tend to be coupled with good health and high quality of life, unstable and single histories less so. Low educational attainment appears to intensify the negative well-being associations of unstable partnership histories. Our results hint at family formation patterns that foster well-being and mechanisms that may boost or buffer the outcomes. Our study also helps policymakers to identify vulnerable subgroups and highlight the importance of romantic relationships for happy and healthy aging.

Acknowledgements

This research was supported by the Academy of Finland as part of the Research Project LoveAge, decision number 317808, and by the Strategic Research Council of the Academy of Finland: FLUX and NetResilience consortiums, decision numbers: 345130, 345131, 345184, 345183.

We wish to thank Andreas Weiland for his guidance with sequence analysis; CSC – IT Center for Science, Finland, for computational resources; Jesse Harrison, Kylli Ek and other CSC staff for their assistance with supercomputers; and the Finnish Ministry for Education for funding CSC, and Tiina Helamaa with literature search.

References

Agresti, A. (2015). *Foundations of Linear and Generalized Linear Models*. Wiley, Hoboken, New Jersey, first edition.

Ajrouch, K. J., Blandon, A. Y., and Antonucci, T. C. (2005). Social Networks Among Men and Women: The Effects of Age and Socioeconomic Status. *The Journals of Gerontology: Series B*, 60(6):S311–S317.

Averett, S. L., Argys, L. M., and Sorkin, J. (2013). In sickness and in health: An examination of relationship status and health using data from the Canadian National Public Health Survey. *Review of Economics of the Household*, 11(4):599–633.

Barlow, A., Duncan, S., James, G., and Park, A. (2001). Just a piece of paper? Marriage and cohabitation. *British Social Attitudes*, pages 29–58.

Becker, G. S. (1973). A Theory of Marriage: Part I. *Journal of Political Economy*, 81(4):813–846.

Becker, G. S. (1991). *A Treatise on the Family: Enlarged Edition*. Harvard University Press.

Beckett, M. (2000). Converging health inequalities in later life–an artifact of mortality selection. *Journal of Health and Social Behavior*, 41(1):106–119.

Bohannon, R. W. (2019). Grip Strength: An Indispensable Biomarker For Older Adults. *Clinical Interventions in Aging*, 14:1681–1691.

Booth, A. and Edwards, J. N. (1992). Starting Over: Why Remarriages Are More Unstable. *Journal of Family Issues*, 13(2):179–194.

Borenstein, M., Hedges, L. V., Higgins, J. P., and Rothstein, H. R. (2021). *Introduction to Meta-Analysis*. John Wiley & Sons.

Borrat-Besson, C., Ryser, V.-A., and Gonçalves, J. (2015). *An Evaluation of the CASP-12 Scale Used in the Survey of Health, Ageing and Retirement in Europe (SHARE) to Measure Quality of Life among People Aged 50+*. (FORS Working Paper series 2015-4). Lausanne. University of Lausanne.

Börsch-Supan, A. and Bergmann, M. (2019). *SHARE Wave 7 Methodology: Panel Innovations and Life Histories*. MEA, Max Planck Institute for Social Law and Social Policy, Munich.

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S., Zuber, S., and SHARE Central Coordination Team (2013). Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology*, 42(4):992–1001.

Boyce, C. J., Wood, A. M., and Ferguson, E. (2016). For better or for worse: The moderating effects of personality on the marriage-life satisfaction link. *Personality and Individual Differences*, 97:61–66.

Brown, S. L. and Wright, M. R. (2017). Marriage, Cohabitation, and Divorce in Later Life. *Innovation in Aging*, 1(2).

Bulanda, J. R., Brown, J. S., and Yamashita, T. (2016). Marital quality, marital dissolution, and mortality risk during the later life course. *Social Science & Medicine*, 165:119–127.

Carr, D. and Utz, R. L. (2020). Families in Later Life: A Decade in Review. *Journal of Marriage and Family*, 82(1):346–363.

Cherlin, A. J. (2004). The deinstitutionalization of American marriage. *Journal of Marriage and Family*, 66(4):848–861.

Cherlin, A. J. (2017). Introduction to the Special Collection on Separation, Divorce, Repartnering, and Remarriage around the World. *Demographic Research*, 37:1275–1296.

Cherlin, A. J. (2020). Degrees of Change: An Assessment of the Deinstitutionalization of Marriage Thesis. *Journal of Marriage and Family*, 82(1):62–80.

Coombs, R. H. (1991). Marital Status and Personal Well-Being: A Literature Review. *Family Relations*, 40(1):97–102.

Cornwell, B. (2015). *Social Sequence Analysis*. Cambridge University Press, New York, NY.

Corti, G. and Scherer, S. (2021). Mating Market and Dynamics of Union Formation. *European Journal of Population*, 37(4-5):851–876.

CSC (2021). Puhti: An environment for high performance computing. Technical report, CSC – IT Center for Science Ltd., Espoo, Finland.

Dannefer, D. (2003). Cumulative Advantage/Disadvantage and the Life Course: Cross-Fertilizing Age and Social Science Theory. *The Journals of Gerontology: Series B*, 58(6):S327–S337.

Demo, D. H. and Acock, A. C. (1996). Singlehood, Marriage, and Remarriage: The Effects of Family Structure and Family Relationships on Mothers' Well-Being. *Journal of Family Issues*, 17(3):388–407.

Dickens, W. T. and Flynn, J. R. (2001). Heritability estimates versus large environmental effects: The IQ paradox resolved. *Psychological Review*, 108(2):346–369.

Diener, E., Gohm, C. L., Suh, E., and Oishi, S. (2000). Similarity of the Relations between Marital Status and Subjective Well-Being Across Cultures. *Journal of Cross-Cultural Psychology*, 31(4):419–436.

Ding, P. and VanderWeele, T. J. (2016). Sensitivity Analysis Without Assumptions. *Epidemiology (Cambridge, Mass.)*, 27(3):368–377.

DiPrete, T. A. and Eirich, G. M. (2006). Cumulative Advantage as a Mechanism for Inequality: A Review of Theoretical and Empirical Developments. *Annual Review of Sociology*, 32:271–297.

Dush, C. M. K. and Amato, P. R. (2005). Consequences of relationship status and quality for subjective well-being. *Journal of Social and Personal Relationships*, 22(5):607–627.

Ferraro, K., Shippee, T., and Schafer, M. (2009). Cumulative inequality theory for research on aging and the life course. In *Bengtson VL, Silverstein M, Putney NM, Gans D (Eds) Handbook of Theories of Aging*, pages 413–433. Springer, New York.

Fischer, J. A. (2009). Subjective Well-Being as Welfare Measure: Concepts and Methodology. Technical Report MPRA Paper No. 16619, OECD, Paris.

Fu, R. and Noguchi, H. (2018). Does the positive relationship between health and marriage reflect protection or selection? Evidence from middle-aged and elderly Japanese. *Review of Economics of the Household*, 16(4):1003–1016.

Gabadinho, A., Ritschard, G., Müller, N. S., and Studer, M. (2011). Analyzing and Visualizing State Sequences in R with TraMineR. *Journal of Statistical Software*, 40:1–37.

Gansner, E. R. and North, S. C. (2000). An open graph visualization system and its applications to software engineering. *Software - Practice and Experience*, 30(11):1203–1233.

Gelman, A. (2018). You need 16 times the sample size to estimate an interaction than to estimate a main effect. https://statmodeling.stat.columbia.edu/2018/03/15/need-16-times-sample-size-estimate-interaction-estimate-main-effect/.

Ginther, D. K. and Zavodny, M. (2001). Is the male marriage premium due to selection? The effect of shotgun weddings on the return to marriage. *Journal of Population Economics*, 14(2):313–328.

Goffman, E. (1959). *The Presentation of Self in Everyday Life*. Anchor, New York.

Goldman, N. (1993). Marriage selection and mortality patterns: Inferences and fallacies. *Demography*, 30(2):189–208.

Gumà, J., Camara, A., and Treviño-Marurí, R. (2014). The relationship between health and partnership history in adulthood: Insights through retrospective information from Europeans aged 50 and over. *European Journal of Ageing*, 12.

Hägglund, A. E., Sorsa, T., Danielsbacka, M., Tanskanen, A., and Rotkirch, A. (2021). *Vanhenee Kuin Hyvä Viini – Yli 50-Vuotiaiden Parisuhteet Suomessa*, volume E56 of *Katsauksia. Perhebarometri 2021*. Population Research Institute.

Han, K.-T., Park, E.-C., Kim, J.-H., Kim, S. J., and Park, S. (2014). Is marital status associated with quality of life? *Health and Quality of Life Outcomes*, 12(1):109.

Hasselblad, V. and Hedges, L. V. (1995). Meta-analysis of screening and diagnostic tests. *Psychological Bulletin*, 117(1):167–178.

Havari, E. and Mazzonna, F. (2015). Can We Trust Older People's Statements on Their Childhood Circumstances? Evidence from SHARELIFE. *European Journal of Population*, 31(3):233–257.

Headey, B. (2010). The Set Point Theory of Well-Being Has Serious Flaws: On the Eve of a Scientific Revolution? *Social Indicators Research*, 97(1):7–21.

Herd, P. (2006). Do Functional Health Inequalities Decrease in Old Age?: Educational Status and Functional Decline Among the 1931-1941 Birth Cohort. *Research on Aging*, 28(3):375–392.

Hlavac, M. (2018). *Stargazer: Well-formatted Regression and Summary Statistics Tables*. Central European Labour Studies Institute (CELSI), Bratislava, Slovakia.

Holt-Lunstad, J., Birmingham, W., and Jones, B. Q. (2008). Is There Something Unique about Marriage? The Relative Impact of Marital Status, Relationship Quality, and Network Social Support on Ambulatory Blood Pressure and Mental Health. *Annals of Behavioral Medicine*, 35(2):239–244.

Horwitz, A. V., White, H. R., and Howell-White, S. (1996). Becoming Married and Mental Health: A Longitudinal Study of a Cohort of Young Adults. *Journal of Marriage and the Family*, 58(4):895.

House, J. S., Umberson, D., and Landis, K. R. (1988). Structures and Processes of Social Support. *Annual Review of Sociology*, 14:293–318.

Hutchison, E. D. (2011). Life Course Theory. In Levesque, R. J. R., editor, *Encyclopedia of Adolescence*, pages 1586–1594. Springer, New York, NY.

Jenkinson, C. (2013). *Measuring Health And Medical Outcomes*. Routledge.

Kaufman, L. and Rousseeuw, P. J. (1990). *Finding Groups in Data: An Introduction to Cluster Analysis*. Wiley Series in Probability and Mathematical Statistics, Applied Probability and Statistics. Wiley, New York (NY).

Kim, H. K. and McKenry, P. C. (2002). The Relationship Between Marriage and Psychological Well-being: A Longitudinal Analysis. *Journal of Family Issues*, 23(8):885–911.

Koball, H. L., Moiduddin, E., Henderson, J., Goesling, B., and Besculides, M. (2010). What Do We Know About the Link Between Marriage and Health? *Journal of Family Issues*, 31(8):1019–1040.

Kontula, O. (2016). *Lemmen Paula. Seksuaalinen Hyvinvointi Parisuhdeonnen Avaimena. Family Barometer 2016*, volume 50. Population Research Institute, Helsinki.

Kratz, F. and Patzina, A. (2020). Endogenous Selection Bias and Cumulative Inequality over the Life Course: Evidence from Educational Inequality in Subjective Well-Being. *European Sociological Review*, 36(3):333–350.

Kuh, D., Ben-Shlomo, Y., Lynch, J., Hallqvist, J., and Power, C. (2003). Life course epidemiology. *Journal of Epidemiology and Community Health*, 57(10):778–783.

Kulminski, A., Yashin, A., Ukraintseva, S., Akushevich, I., Arbeev, K., Land, K., and Manton, K. (2006). Accumulation of health disorders as a systemic measure of aging: Findings from the NLTCS data. *Mechanisms of Ageing and Development*, 127(11):840–848.

Leary, M. R. (1999). Making Sense of Self-Esteem. *Current Directions in Psychological Science*, 8(1):32–35.

Lenth, R. V. (2021). *Emmeans: Estimated Marginal Means, Aka Least-Squares Means*.

Lesthaeghe, R. and van de Kaa, K. (1986). Twee demografische transities? In *Bevolking: Groei En Krimp.*, pages 9–24. Van Loghum Slaterus, Deventer.

Lewis, M. A. and Butterfield, R. M. (2007). Social Control in Marital Relationships: Effect of One's Partner on Health Behaviors1. *Journal of Applied Social Psychology*, 37(2):298–319.

Liu, H. and Umberson, D. J. (2008). The Times They Are a Changin': Marital Status and Health Differentials from 1972 to 2003. *Journal of Health and Social Behavior*, 49(3):239–253.

Long, J. A. (2020). *Jtools: Analysis and Presentation of Social Scientific Data*.

Ludwig, V. and Brüderl, J. (2018). Is There a Male Marital Wage Premium? New Evidence from the United States. *American Sociological Review*, 83(4):744–770.

Luyckx, K., Seiffge-Krenke, I., Schwartz, S. J., Crocetti, E., and Klimstra, T. A. (2014). Identity configurations across love and work in emerging adults in romantic relationships. *Journal of Applied Developmental Psychology*, 35(3):192–203.

Manzoli, L., Villari, P., M Pirone, G., and Boccia, A. (2007). Marital status and mortality in the elderly: A systematic review and meta-analysis. *Social Science & Medicine*, 64(1):77–94.

Margolis, R. and Myrskylä, M. (2011). A Global Perspective on Happiness and Fertility. *Population and Development Review*, 37(1):29–56.

Mastekaasa, A. (1992). Marriage and Psychological Well-Being: Some Evidence on Selection into Marriage. *Journal of Marriage and the Family*, 54(4):901.

Mead, G. H. (1934). *Mind, Self, and Society: The Definitive Edition*. University of Chicago Press, Chicago ; London, enlarged edition edition.

Meara, E. R., Richards, S., and Cutler, D. M. (2008). The Gap Gets Bigger: Changes In Mortality And Life Expectancy, By Education, 1981–2000. *Health Affairs*, 27(2):350–360.

Mehta, N. K., Zheng, H., and Myrskylä, M. (2019). How do age and major risk factors for mortality interact over the life-course? Implications for health disparities research and public health policy. *SSM - Population Health*, 8:100438.

Melo, S., Guedes, J., and Mendes, S. (2019). Theory of Cumulative Disadvantage/Advantage. In Gu, D. and Dupre, M. E., editors, *Encyclopedia of Gerontology and Population Aging*, pages 1–8. Springer International Publishing, Cham.

Merton, R. K. (1968). The Matthew Effect in Science: The reward and communication systems of science are considered. *Science*, 159(3810):56–63.

Merton, R. K. (1988). The Matthew Effect in Science, II: Cumulative Advantage and the Symbolism of Intellectual Property. *Isis*, 79(4):606–623.

Metsä-Simola, N. and Martikainen, P. (2013). The short-term and long-term effects of divorce on mortality risk in a large Finnish cohort, 1990–2003. *Population Studies*, 67(1):97–110.

Mirowsky, J. and Ross, C. E. (2005). Education, cumulative advantage, and health. *Ageing International*, 30(1):27–62.

Mirowsky, J. and Ross, C. E. (2008). Education and Self-Rated Health: Cumulative Advantage and Its Rising Importance. *Research on Aging*, 30(1):93–122.

Monnat, S. M. and Chandler, R. F. (2015). Long-Term Physical Health Consequences of Adverse Childhood Experiences. *The Sociological Quarterly*, 56(4):723–752.

Mookherjee, H. N. (1997). Marital Status, Gender, and Perception of Weil-Being. *The Journal of Social Psychology*, 137(1):95–105.

Næss, E. O., Mehlum, L., and Qin, P. (2021). Marital status and suicide risk: Temporal effect of marital breakdown and contextual difference by socioeconomic status. *SSM - Population Health*, 15:100853.

O'flaherty, M., Baxter, J., Haynes, M., and Turrell, G. (2016). The Family Life Course and Health: Partnership, Fertility Histories, and Later-Life Physical Health Trajectories in Australia. *Demography; Silver Spring*, 53(3):777–804.

Øien-Ødegaard, C., Hauge, L. J., and Reneflot, A. (2021). Marital status, educational attainment, and suicide risk: A Norwegian register-based population study. *Population Health Metrics*, 19(1):33.

O'Rand, A. M. (2001). Stratification and the life course: The forms of life-course capital and their interrelationships. In *Handbook of Aging and the Social Sciences*, pages 197–213. Academic Press, San Diego, CA, US.

Pampel, F. C. and Rogers, R. G. (2004). Socioeconomic Status, Smoking, and Health: A Test of Competing Theories of Cumulative Advantage. *Journal of Health and Social Behavior*, 45(3):306–321.

Perelli-Harris, B. and Amos, M. (2015). Changes in partnership patterns across the life course: An examination of 14 countries in Europe and the United States. *Demographic Research*, 33(6):145–178.

Pinquart, M. (2003). Loneliness in Married, Widowed, Divorced, and Never-Married Older Adults. *Journal of Social and Personal Relationships*, 20(1):31–53.

Price, D. J. d. S. (1965). Networks of Scientific Papers. *Science*, 149(3683):510–515.

Prus, S. G. (2007). Age, SES, and health: A population level analysis of health inequalities over the lifecourse. *Sociology of Health & Illness*, 29(2):275–296.

R Core Team (2021). R: A language and environment for statistical computing. Technical report, R Foundation for Statistical Computing, Vienna, Austria.

Rault, W. (2019). Is the Civil Solidarity Pact the Future of Marriage? The Several Meanings of the French Civil Union. *International Journal of Law, Policy and the Family*, 33(2):139–159.

Reczek, C., Pudrovska, T., Carr, D., Thomeer, M. B., and Umberson, D. (2016). Marital Histories and Heavy Alcohol Use among Older Adults. *Journal of Health and Social Behavior*, 57(1):77–96.

Ren, X. S. (1997). Marital status and quality of relationships: The impact on health perception. *Social Science & Medicine*, 44(2):241–249.

Reneflot, A. and Mamelund, S.-E. (2012). The Association Between Marital Status and Psychological Well-being in Norway. *European Sociological Review*, 28:355–365.

Rich, B. (2021). *Table1: Tables of Descriptive Statistics in HTML*.

Rindfuss, R. R. and Vandenheuvel, A. (2022). Cohabitation: A Precursor to Marriage or an Alternative to Being Single? *Population and Development Review*, 16(4):25.

Roberson, P. N. E., Norona, J. C., Lenger, K. A., and Olmstead, S. B. (2018). How do Relationship Stability and Quality Affect Wellbeing?: Romantic Relationship Trajectories, Depressive Symptoms, and Life Satisfaction across 30 Years. *Journal of Child and Family Studies*, 27(7):2171–2184.

Roberts, S. G. B. and Dunbar, R. I. M. (2011). Communication in social networks: Effects of kinship, network size, and emotional closeness. *Personal Relationships*, 18(3):439–452.

Ross, C. E. (1995). Reconceptualizing Marital Status as a Continuum of Social Attachment. *Journal of Marriage and the Family*, 57(1):129.

Ross, C. E. and Wu, C.-l. (1995). The Links Between Education and Health. *American Sociological Review*, 60(5):719.

Ross, C. E. and Wu, C.-L. (1996). Education, Age, and the Cumulative Advantage in Health. *Journal of Health and Social Behavior*, 37(1):104.

Rotkirch, A. (2020). What are couples made of? Union formation in high-income societies. In *Burger, O., Lee, R. & Sear, R. (Eds) Human Evolutionary Demography*. Open Book Publishers.

Sassler, S. (2010). Partnering Across the Life Course: Sex, Relationships, and Mate Selection. *Journal of Marriage and Family*, 72(3):557–575.

Schartz, C. R. (2010). Pathways to Educational Homogamy in Marital and Cohabiting Unions. *Demography*, 47(3):735–753.

Schütz, J. (2019). Marital Biography and Health in Old Age: Insights from European Survey Data. https://archiv.ub.uni-heidelberg.de/volltextserver/25996/.

Scott, E. S. (2000). Social norms and the legal regulation of marriage. *Virginia law review*, pages 1901–1970.

Stryker, S. (1959). Symbolic Interaction as an Approach to Family Research. *Marriage and Family Living*, 21(2):111.

Studer, M. (2013). WeightedCluster Library Manual: A practical guide to creating typologies of trajectories in the social sciences with R. Technical report, LIVES Working Papers 24.

Tavakol, Z., Nikbakht Nasrabadi, A., Behboodi Moghadam, Z., Salehiniya, H., and Rezaei, E. (2017). A Review of the Factors Associated with Marital Satisfaction. *Galen Medical Journal*, 6(3).

Umberson, D. (1992). Gender, marital status and the social control of health behavior. *Social Science & Medicine*, 34(8):907–917.

van Buuren, S. and Groothuis-Oudshoorn, K. (2011). Mice: Multivariate imputation by chained equations in r. *Journal of Statistical Software*, 45(3):1–67.

VanderWeele, T. J. (2017). On a Square-Root Transformation of the Odds Ratio for a Common Outcome:. *Epidemiology*, 28(6):e58–e60.

VanderWeele, T. J. and Ding, P. (2017). Sensitivity Analysis in Observational Research: Introducing the E-Value. *Annals of Internal Medicine*, 167(4):268–274.

Verbakel, E. (2012). Subjective Well-Being by Partnership Status and Its Dependence on the Normative Climate. *European Journal of Population / Revue européenne de Démographie*, 28(2):205–232.

Waite, L. J. (1995). Does Marriage Matter? *Demography*, 32(4):483–507.

Wang, D., Li, D., Mishra, S. R., Lim, C., Dai, X., Chen, S., and Xu, X. (2022). Association between marital relationship and multimorbidity in middle-aged adults: A longitudinal study across the US, UK, Europe, and China. *Maturitas*, 155:32–39.

Wängqvist, M., Carlsson, J., van der Lee, M., and Frisén, A. (2016). Identity Development and Romantic Relationships in the Late Twenties. *Identity*, 16(1):24–44.

Ward, J. H. (1963). Hierarchical Grouping to Optimize an Objective Function. *Journal of the American Statistical Association*, 58(301):236–244.

Westmaas, J. L., Wild, T. C., and Ferrence, R. (2002). Effects of gender in social control of smoking cessation. *Health psychology*, 21(4):368.

Wickham, H. (2016). *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York.

Wong, J. S. and Waite, L. J. (2015). Marriage, Social Networks, and Health at Older Ages. *Journal of Population Ageing*, 8(1-2):7–25.

Wood, R. G., Avellar, S., and Goesling, B. (2009). *The Effects of Marriage on Health: A Synthesis of Recent Research Evidence*. Nova Science New York, NY.

Zahl-Olsen, R., Thuen, F., and Espehaug, B. (2019). Divorce and Remarriage in Norway: A Prospective Cohort Study Between 1981 and 2013. *Journal of Divorce & Remarriage*, 60(8):600–611.

Zajacova, A. and Lawrence, E. M. (2018). The relationship between education and health: Reducing disparities through a contextual approach. *Annual review of public health*, 39:273–289.

Zimmermann, O. and Hameister, N. (2019). Stable cohabitational unions increase quality of life: Retrospective analysis of partnership histories also reveals gender differences. *Demographic Research*, 40:657–692.

Appendix

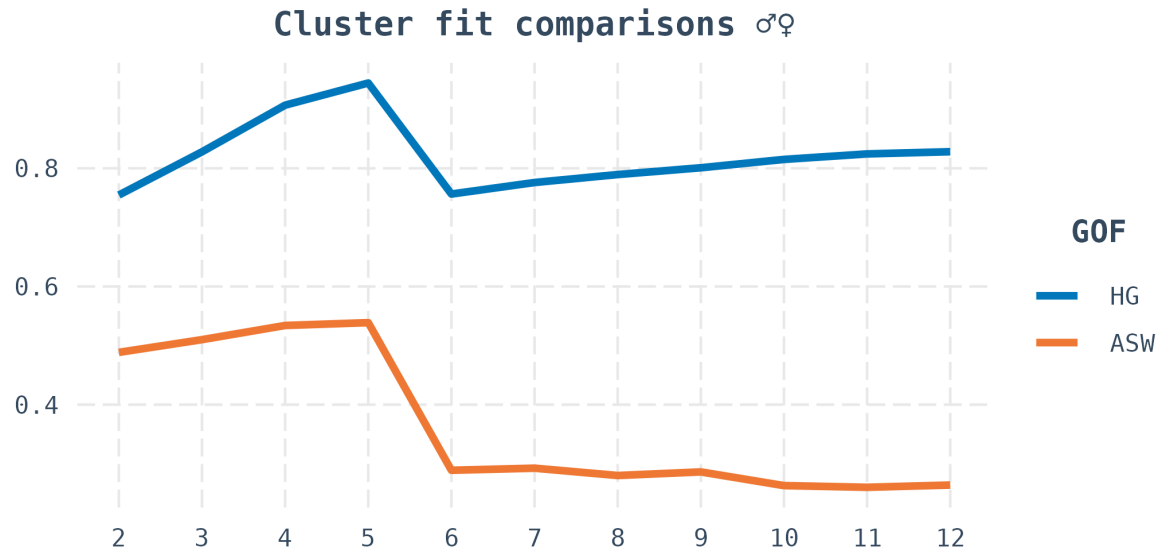


Fig. A.1: The goodness of fit tests for the number of clusters

Table A.1: Multinomial regression: relative risk ratios for belonging to a cluster.

	Cluster			
	2	3	4	5
	(1)	(2)	(3)	(4)
Belgium	0.985	1.012	0.908	0.988
	(0.113)	(0.096)	(0.133)	(0.150)
Denmark	1.390***	0.705***	1.557***	0.739*
	(0.115)	(0.114)	(0.131)	(0.176)
Estonia	1.540***	0.872	1.286*	1.171
	(0.110)	(0.104)	(0.131)	(0.152)
Finland	0.811	0.661***	1.335*	0.950
	(0.152)	(0.137)	(0.154)	(0.193)
France	0.827	0.862	1.031	1.086
	(0.123)	(0.104)	(0.136)	(0.155)
Germany	1.338***	0.507***	0.525***	0.670**
	(0.111)	(0.115)	(0.156)	(0.169)
Latvia	1.378**	1.197	0.744	1.283
	(0.150)	(0.134)	(0.210)	(0.202)
Lithuania	0.966	0.965	0.451***	0.753
	(0.152)	(0.130)	(0.229)	(0.219)
Luxembourg	0.641**	0.551***	0.273***	0.788
	(0.178)	(0.159)	(0.290)	(0.222)
Netherlands	0.676**	0.565***	0.342***	1.427**
	(0.164)	(0.148)	(0.245)	(0.176)
Sweden	1.122	0.994	2.073***	1.262
	(0.122)	(0.107)	(0.127)	(0.158)
Switzerland	1.178	1.103	1.001	1.269
	(0.127)	(0.111)	(0.154)	(0.166)
Constant	0.150***	0.216***	0.107***	0.080***
	(0.088)	(0.076)	(0.103)	(0.118)
Akaike Inf. Crit.	40,364.960	40,364.960	40,364.960	40,364.960

Note: *p<0.1; **p<0.05; ***p<0.01
Austria is the reference country

	Model 1	Model 2	Model 3
(Intercept)	0.59**	−0.04	0.08
	(0.20)	(0.20)	(0.20)
c2	−0.05	−0.06	−0.05
	(0.04)	(0.04)	(0.04)
c3	−0.15***	−0.18***	−0.14***
	(0.04)	(0.04)	(0.04)
c4	−0.13**	−0.14**	−0.09*
	(0.04)	(0.04)	(0.04)
c5	−0.20***	−0.20***	−0.13*
	(0.05)	(0.05)	(0.05)
age	−0.01**	0.00	0.00
	(0.00)	(0.00)	(0.00)
hunger_Yes		−0.15	−0.15
		(0.09)	(0.09)
feat10		0.21***	0.15***
		(0.02)	(0.02)
book10		0.02	−0.00
		(0.01)	(0.01)
room10		0.07*	0.06*
		(0.03)	(0.02)
intact_family10_No		−0.13***	−0.10**
		(0.04)	(0.03)
children_1			−0.05
			(0.03)
children_0			−0.04
			(0.04)
education_Secondary			−0.09***
			(0.03)
education_Basic			−0.20***
			(0.03)
log_income			0.17*
			(0.06)
nimp	6	6	6
nobs	8233	8233	8233
R^2	0.00	0.07	0.11
Adj. R^2	0.00	0.07	0.11

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.2: Linear regresssion for Subjective Health (men)

	Model 1	Model 2	Model 3
(Intercept)	−0.32	−0.83***	−0.77***
	(0.20)	(0.20)	(0.21)
c2	−0.03	−0.04	−0.03
	(0.04)	(0.04)	(0.04)
c3	−0.25***	−0.27***	−0.23***
	(0.04)	(0.04)	(0.04)
c4	−0.20***	−0.21***	−0.17***
	(0.04)	(0.04)	(0.04)
c5	−0.36***	−0.36***	−0.31***
	(0.05)	(0.05)	(0.05)
age	0.01	0.01***	0.01***
	(0.00)	(0.00)	(0.00)
hunger_Yes		−0.15	−0.14
		(0.10)	(0.10)
feat10		0.19***	0.12**
		(0.01)	(0.03)
book10		0.01	0.01
		(0.01)	(0.01)
room10		0.03	0.01
		(0.02)	(0.02)
intact_family10_No		−0.10**	−0.07*
		(0.03)	(0.04)
children_1			−0.06
			(0.03)
children_0			−0.03
			(0.04)
education_Secondary			−0.03
			(0.03)
education_Basic			−0.09**
			(0.03)
log_income			0.20*
			(0.07)
nimp	6	6	6
nobs	8233	8233	8233
R^2	0.01	0.06	0.10
Adj. R^2	0.01	0.06	0.10

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.3: Linear regresssion for Life Satisfaction (men)

	Model 1	Model 2	Model 3
(Intercept)	1.31^{***}	0.49^{**}	0.56^{**}
	(0.18)	(0.18)	(0.18)
c2	-0.15^{***}	-0.15^{***}	-0.13^{***}
	(0.03)	(0.03)	(0.03)
c3	-0.15^{***}	-0.15^{***}	-0.12^{***}
	(0.03)	(0.03)	(0.03)
c4	-0.06	-0.08^{*}	-0.07
	(0.04)	(0.04)	(0.04)
c5	-0.24^{***}	-0.22^{***}	-0.18^{**}
	(0.05)	(0.05)	(0.05)
age	-0.02^{***}	-0.01^{*}	-0.01^{*}
	(0.00)	(0.00)	(0.00)
hunger_Yes		-0.23^{**}	-0.22^{**}
		(0.08)	(0.08)
feat10		0.19^{***}	0.13^{***}
		(0.02)	(0.02)
book10		0.05^{***}	0.02
		(0.01)	(0.01)
room10		0.10^{*}	0.08
		(0.03)	(0.03)
intact_family10_No		-0.14^{***}	-0.12^{***}
		(0.03)	(0.03)
children_1			-0.10^{***}
			(0.02)
children_0			-0.00
			(0.04)
education_Secondary			-0.10^{***}
			(0.02)
education_Basic			-0.18^{***}
			(0.03)
log_income			0.17^{*}
			(0.06)
nimp	6	6	6
nobs	10023	10023	10023
R^2	0.01	0.09	0.13
Adj. R^2	0.01	0.09	0.13

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.4: Linear regresssion for Subjective Health (women)

	Model 1	Model 2	Model 3
(Intercept)	0.08	-0.58^{**}	-0.53^{*}
	(0.19)	(0.18)	(0.20)
c2	-0.07^{*}	-0.08^{*}	-0.05
	(0.03)	(0.03)	(0.03)
c3	-0.26^{***}	-0.26^{***}	-0.23^{***}
	(0.03)	(0.03)	(0.03)
c4	-0.10^{*}	-0.12^{**}	-0.11^{**}
	(0.04)	(0.04)	(0.04)
c5	-0.26^{***}	-0.25^{***}	-0.20^{***}
	(0.05)	(0.05)	(0.06)
age	-0.00	0.01^{***}	0.01^{**}
	(0.00)	(0.00)	(0.00)
hunger_Yes		-0.32^{***}	-0.31^{***}
		(0.08)	(0.08)
feat10		0.17^{***}	0.11^{**}
		(0.01)	(0.02)
book10		0.04^{**}	0.03^{*}
		(0.01)	(0.01)
room10		0.05^{**}	0.03
		(0.02)	(0.01)
intact_family10_No		-0.07^{*}	-0.05
		(0.03)	(0.03)
children_1			-0.11^{***}
			(0.03)
children_0			0.01
			(0.04)
education_Secondary			-0.04
			(0.02)
education_Basic			-0.03
			(0.03)
log_income			0.19^{*}
			(0.06)
nimp	6	6	6
nobs	10023	10023	10023
R^2	0.01	0.06	0.10
Adj. R^2	0.01	0.06	0.10

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A.5: Linear regresssion for Life Satisfaction (women)

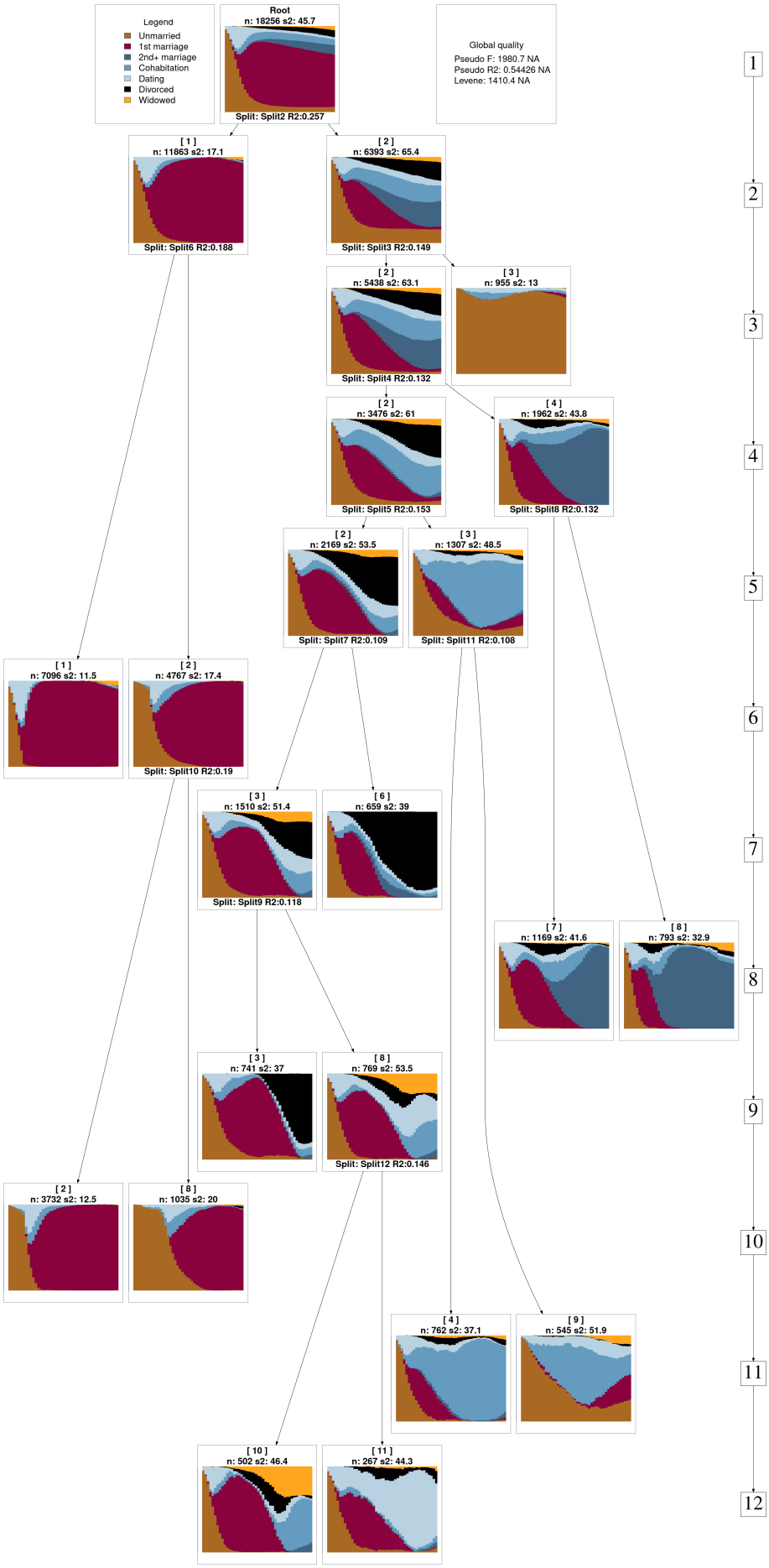


Fig. A.2: Sequence regression tree displaying all options for the number of clusters

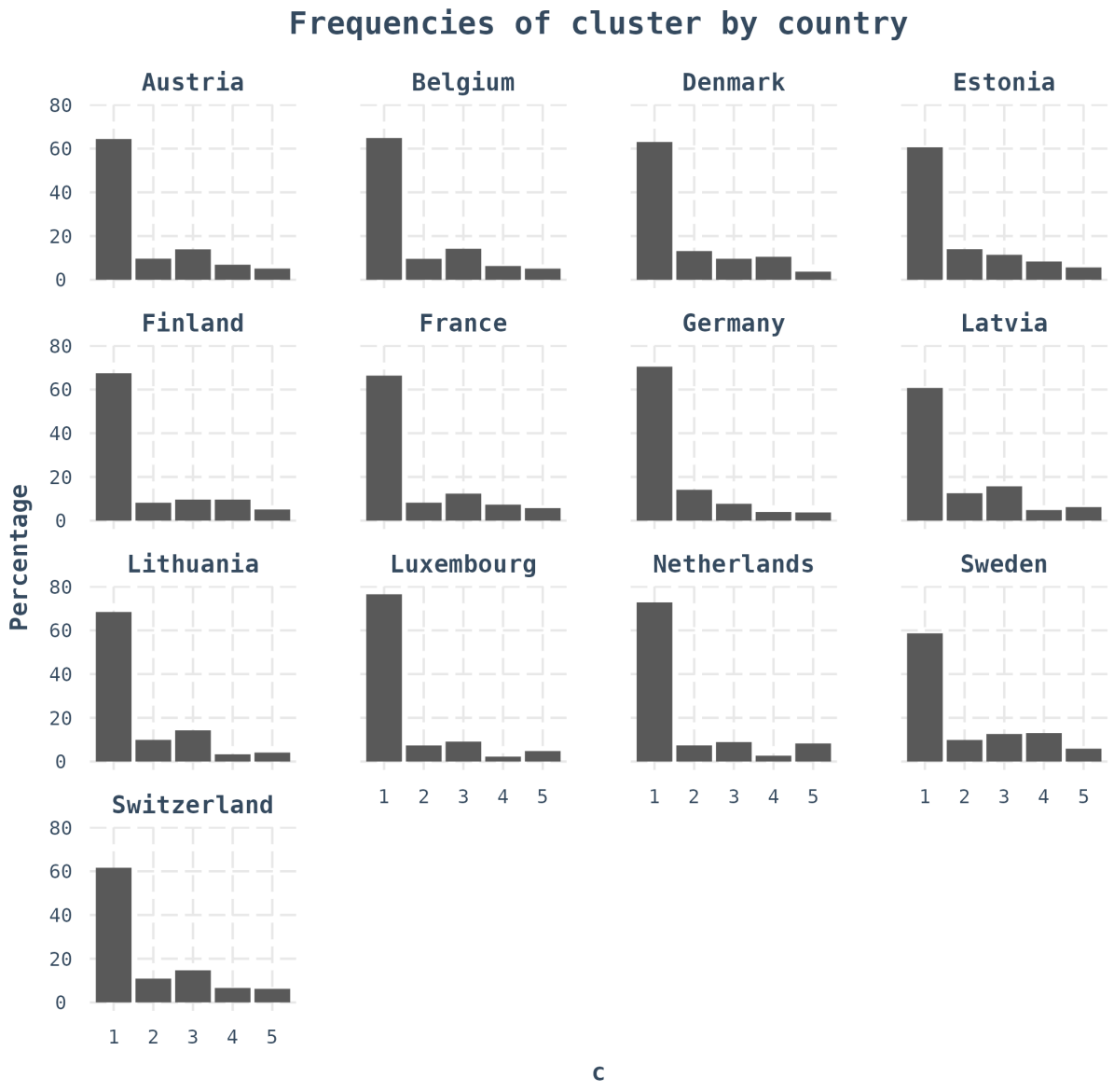


Fig. A.3: Cluster membership percentages by country

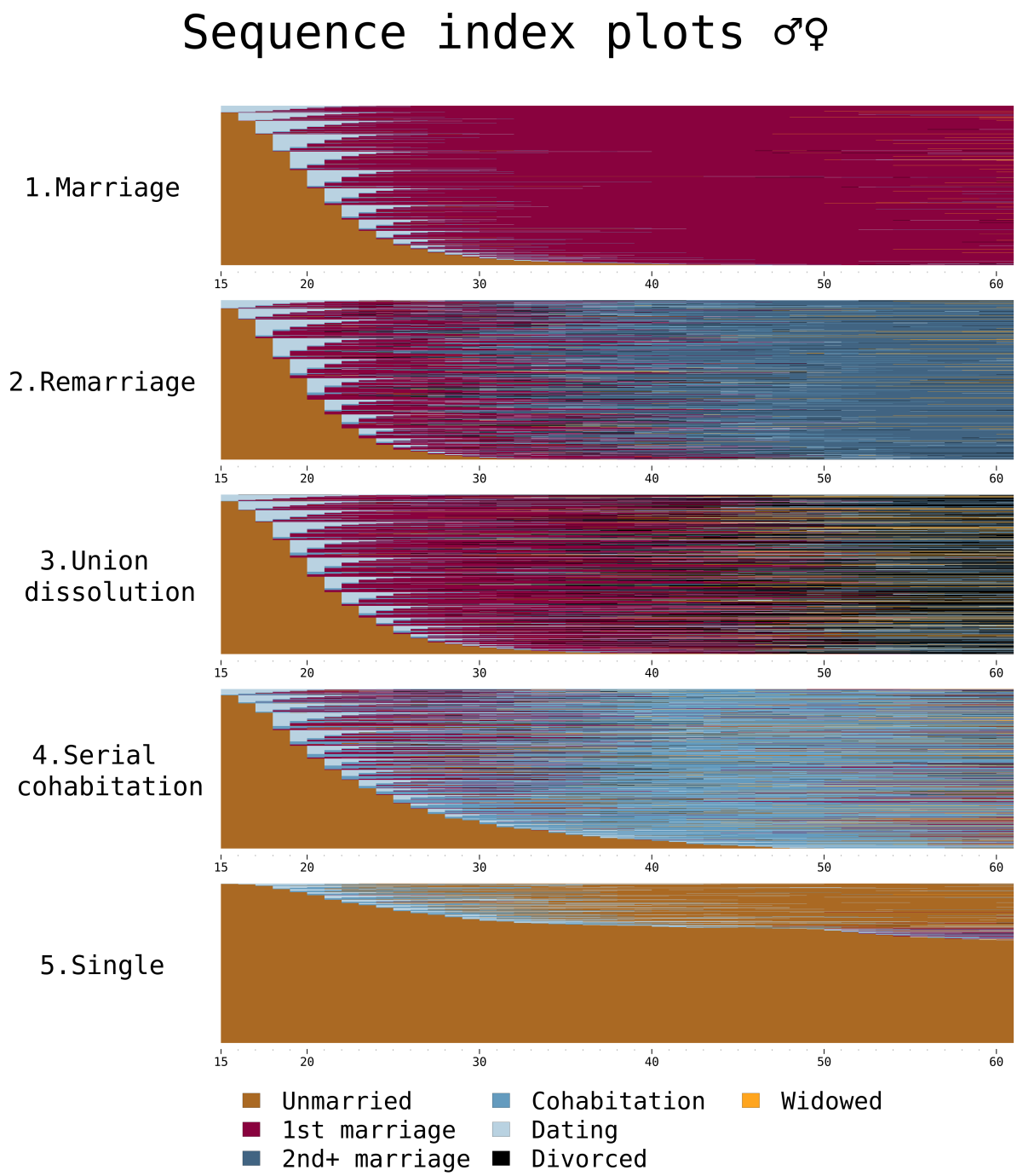
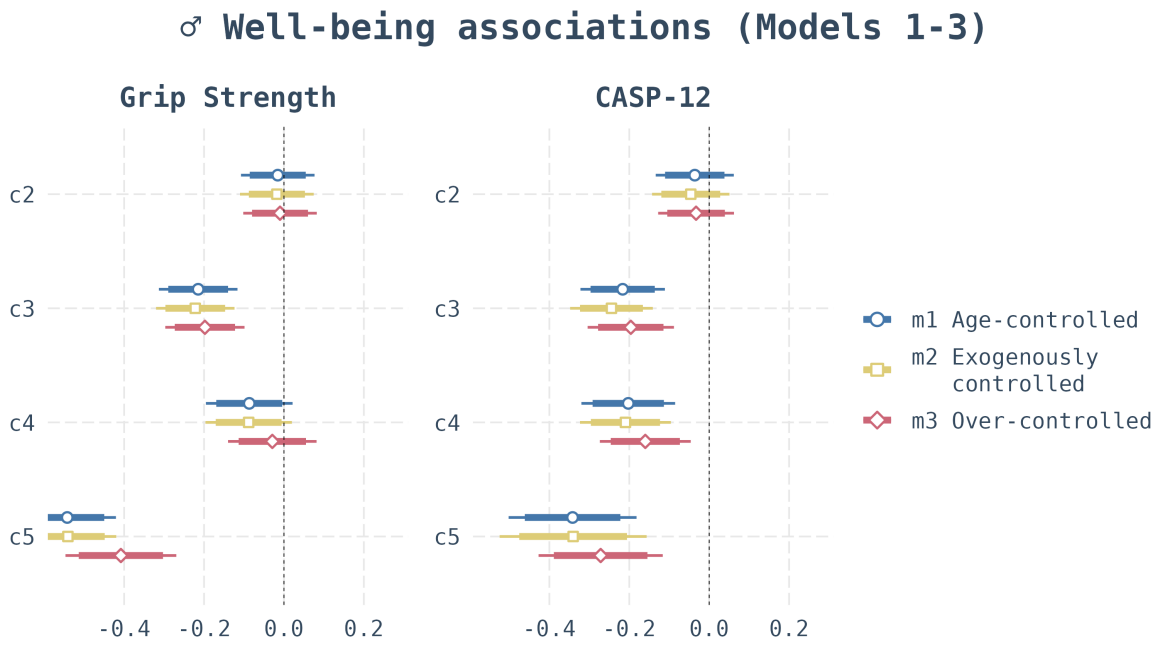
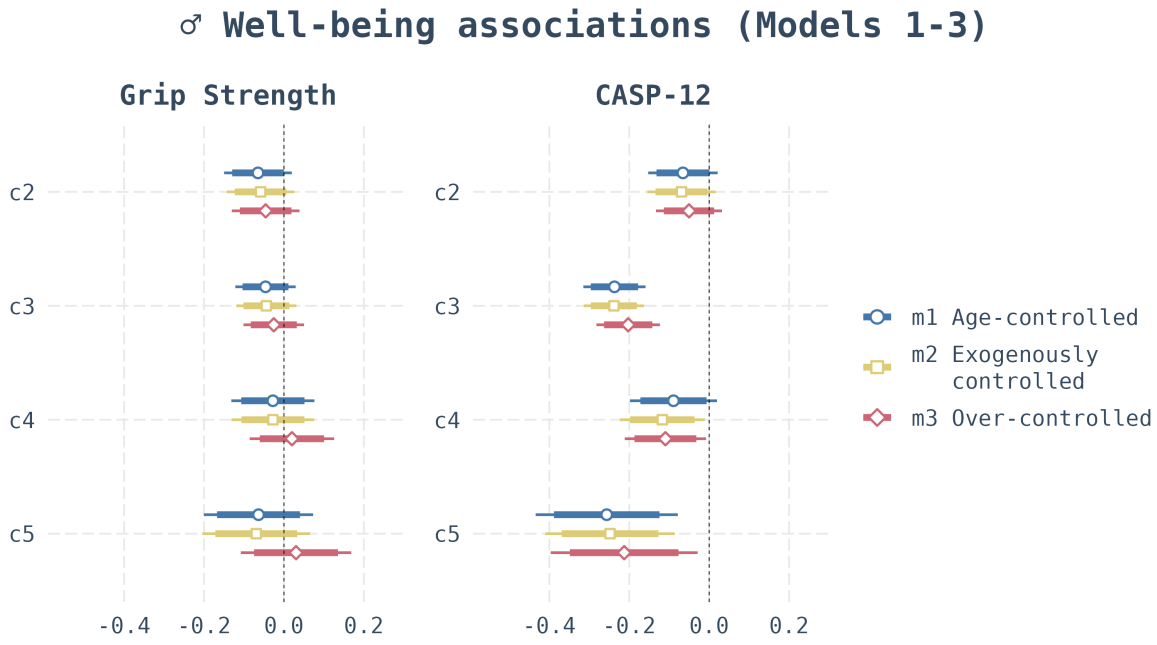


Fig. A.4: Sequence index plots for partnership history clusters for Western and Northern European men and women born in 1945 - 1957 at the age of 15 - 60



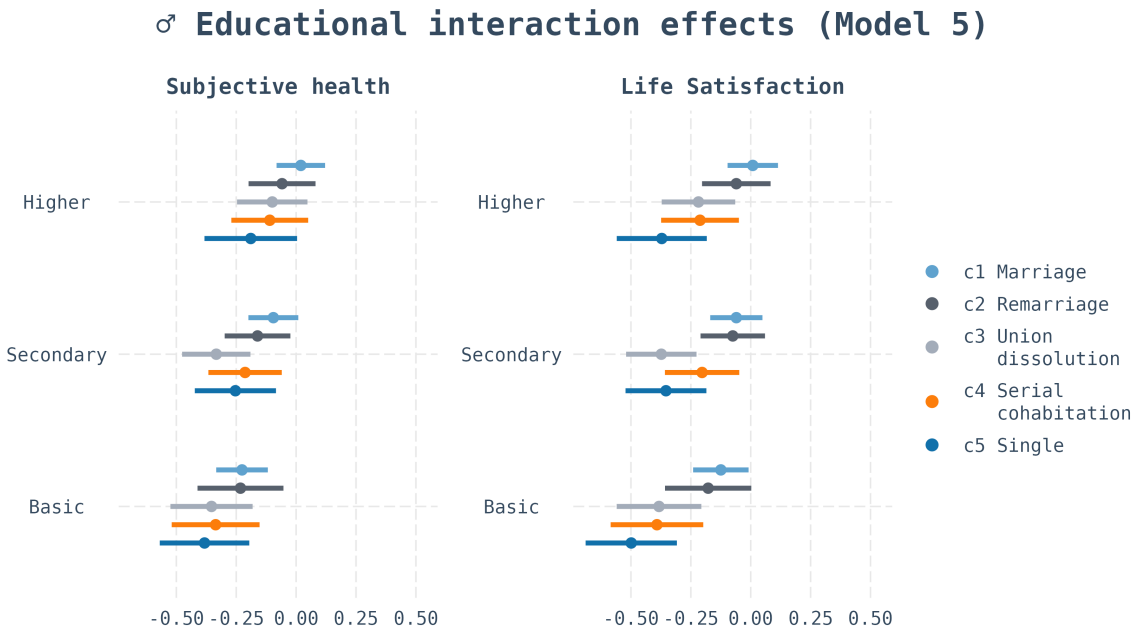
(a) Men



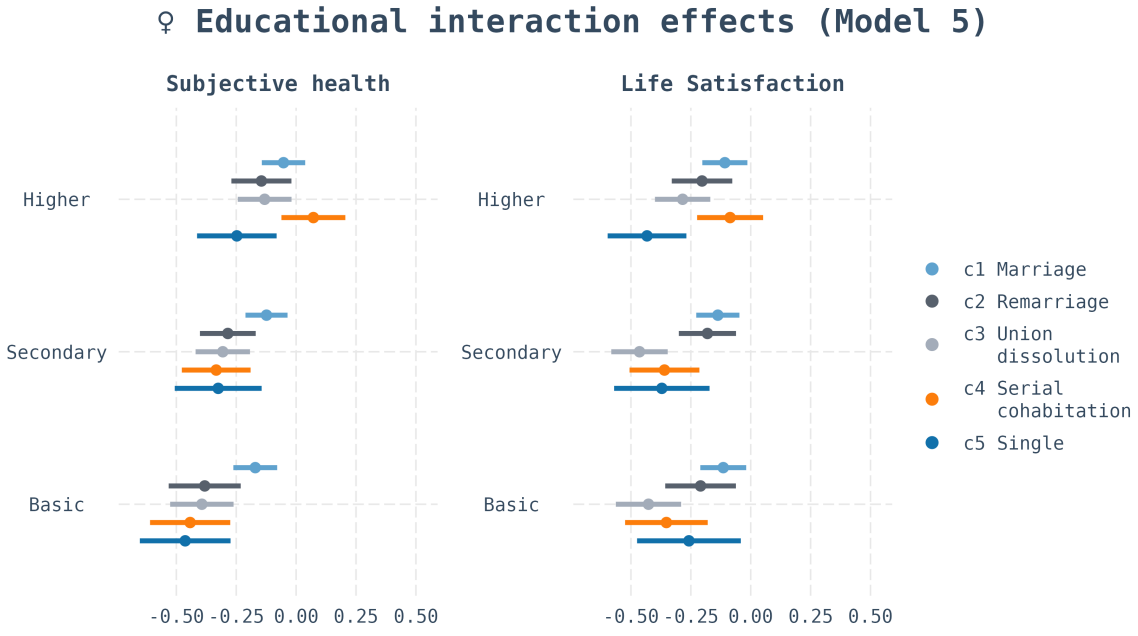
(b) Women

Fig. A.5: Linear regression for grip strength and CASP-12 without interaction effects (Models 1,2 & 3)

Note: Marriage (c1) is the reference category. Other categories are Remarriage (c2), Union dissolution (c3), Serial cohabitation (c4), and Single (c5).

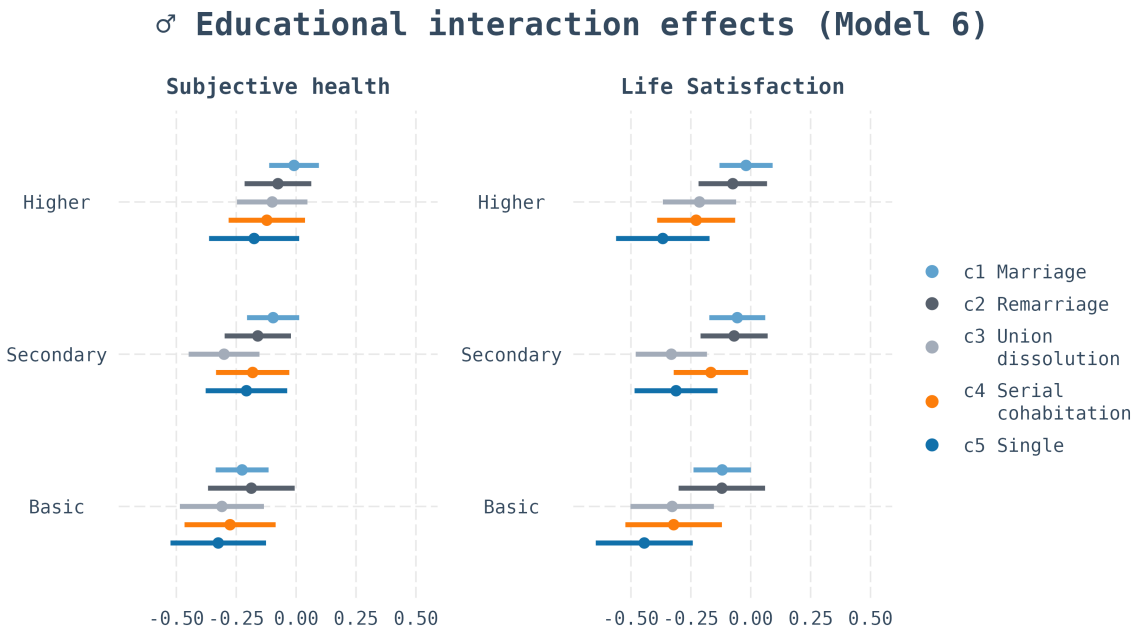


(a) Men

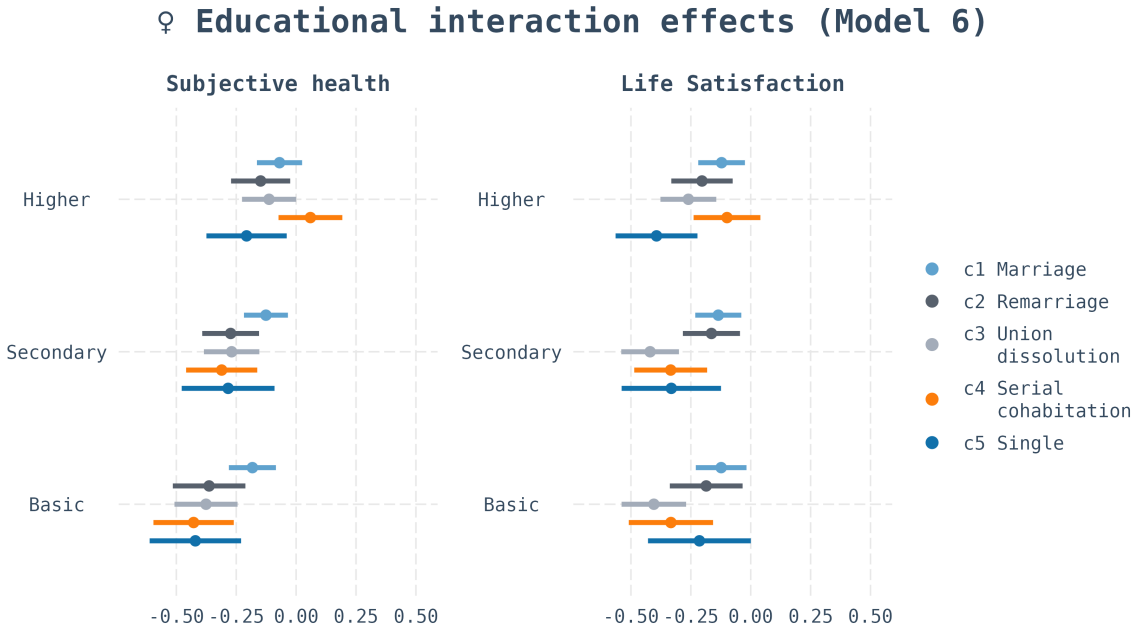


(b) Women

Fig. A.6: Linear regression for Subjective Health and Life Satisfaction with educational interaction effects (Model 5)

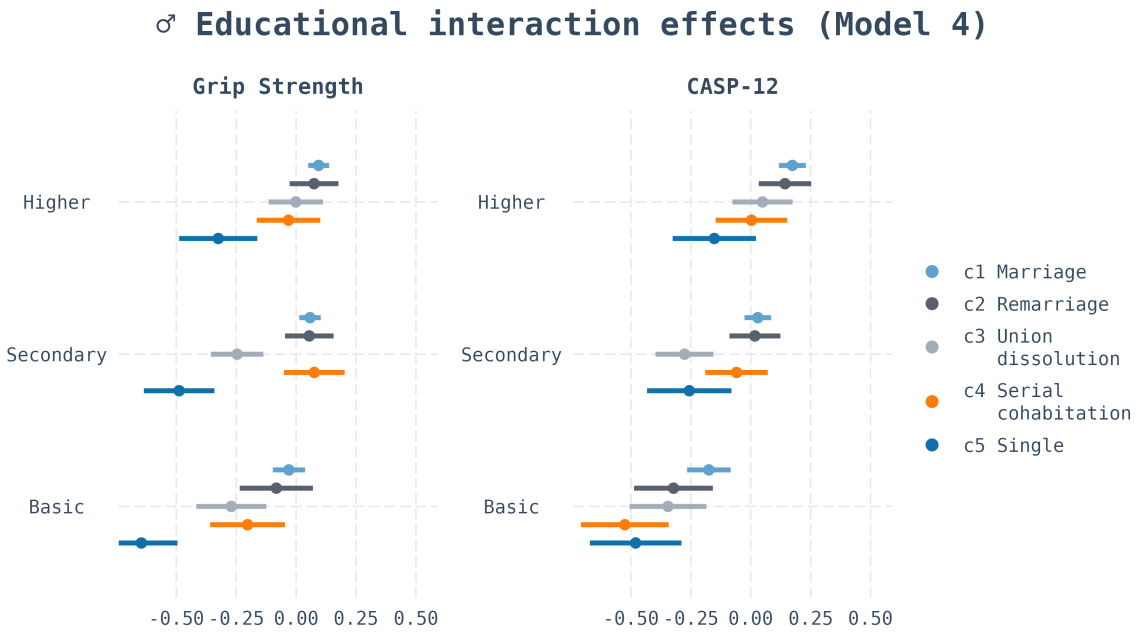


(a) Men

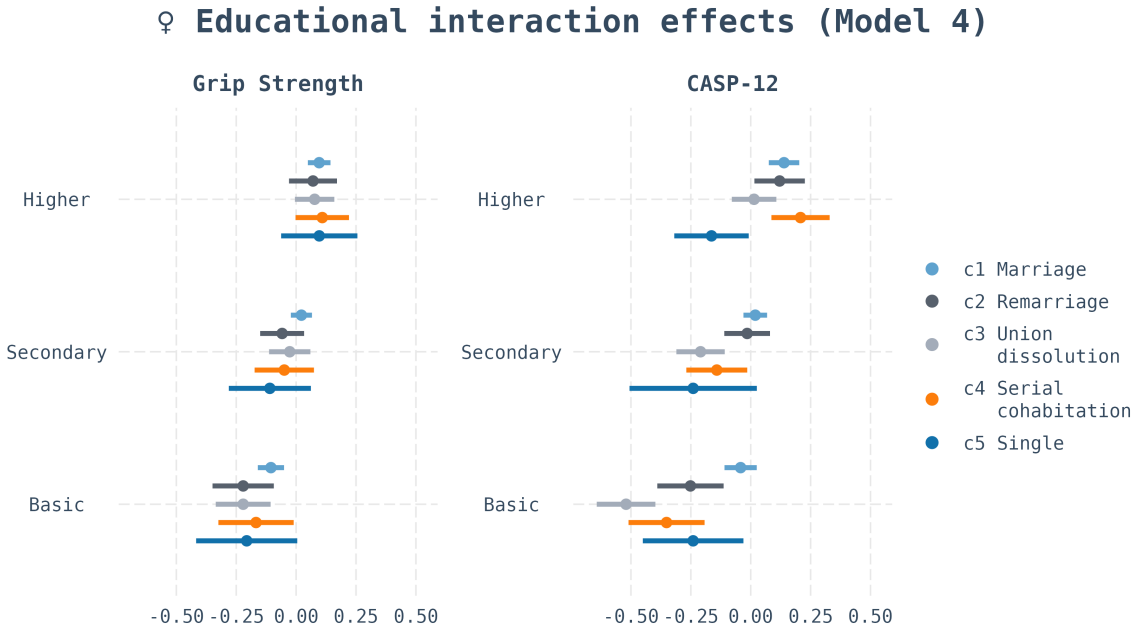


(b) Women

Fig. A.7: Linear regression for Subjective Health and Life Satisfaction with educational interaction effects (Model 6)



(a) Men



(b) Women

Fig. A.8: Linear regression for grip strength and CASP-12 with educational interaction effects (Model 4)