



Even Now Women Focus on Family, Men on Work: An Analysis of Employment, Marital, and Reproductive Life-Course Typologies in Relation to Change in Health-Related Quality of Life

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Received: 3 August 2022 / Accepted: 22 November 2022 / Published online: 2 December 2022
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Abstract

To a large extent health-related quality of life (HRQoL) is a product of life-course experiences. Therefore, we examined employment, marital, and reproductive life-course typologies as predictors of HRQoL in women and men. To determine life course clusters, sequence and cluster analysis were performed on the annual (waves 1990–2019) employment, marital, and children in household states of the German Socio-Economic Panel data (N = 8,998; age = 53.57, 52.52% female); separately for men and women. Using hierarchical linear regression analyses, and Tukey HSD post-hoc tests, associations between clusters and change in life satisfaction, subjective mental, and physical health were examined. Five life-course clusters were identified in the female and six in the male sample. Life courses differed greatly across gender regarding employment aspects (e.g., men generally work full-time vs. women underwent frequent transitions). The family aspects appeared similar – e.g., ‘starting a family’ or ‘marital separation’ clusters – but still differed in the particulars. Life course typologies were related to distinct patterns of HRQoL. For instance, both for men and women the ‘separated’ clusters, as well as the male ‘entering non-employment’ cluster were associated with a steeper decline in HRQoL. However, change in subjective mental health showed few associations. Distinct types of life courses and differential associations with sociodemographic background and HRQoL emerged for women and men. The analyses reveal a burden on individuals who experienced marital separation, and non-employment and thus present important target groups for health prevention, e.g., for physical health problems.

Keywords Life course · Health-related quality of life · Gender · Cluster analysis · Employment · Family

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Introduction

A ‘healthy lifestyle’ is a phrase often used by health services. This generally addresses health behaviours like a balanced diet or physical activity (Kekäläinen et al., 2020), but to what extent does a healthy lifestyle – and its relation to health-related quality of life (HRQoL) – also refer to how life is shaped by family and employment? And further, do certain lifestyles relate to HRQoL differently in men and women?

The concept of work-family-balance – i.e., the homemakers versus the breadwinners – has been connected to HRQoL and shown to differ in men and women. For instance, a focus on family integration over career success corresponds to social expectations of women but can lead to disengagement at work and would thus foster the work-family conflict (Lyu & Fan, 2020).

In general, better health status is associated with full-time compared to part-time or non-employment (Tomczyk et al., 2021; Gander et al., 2021), but men tend to assign greater importance to work and to report worse effects following unemployment (McKee-Ryan et al., 2005). Yet, female participation in the labour market is rising in most European countries and attitudes towards gender roles are increasingly liberal as well (Stavrova et al., 2012). While men gain most of their status from their job, women attain their status from numerous sources (van der Meer, 2014). Forret et al. (2010) found that men with children who lost their paid work were more likely to see it as a defeat while women were more likely to see it as an opportunity.

In the past decades, an increase in father’s – and mother’s – contribution to childcare is seen Boll and Leppin (2011). Still, more time spent with childcare, household chores, and errands is related to lower HRQoL in women, but unrelated in men (Tomczyk et al., 2021). While the having a child is considered generally a joyous event, this increase in HRQoL is short-lived for fathers (Krämer & Rodgers, 2020), and mothers report lower happiness, more stress, and greater fatigue with increased time spent on childcare (Musick et al., 2016).

Being in a partnership and cohabiting is related to better HRQoL (Brazil & Clark, 2017), but again gender differences are evident; for instance, previous as opposed to present marriage is related to better life satisfaction in men (Frijters et al., 2004).

Most commonly previous studies examine life events or characteristics at a specific time point in relation to health, this approach however neglects the dynamic processes of life experiences especially in relation to health (e.g., Plagnol & Scott, 2011). In the last decade, studies have examined health outcomes in relation to life courses in the domains of employment (Giudici & Morselli, 2019), relationships and reproductivity (Mariani et al., 2017), and housing (Lim et al., 2020). Consistent across these studies is that some life course typologies are related to better HRQoL than others.

As we wanted to examine the holistic picture of the impact of work and family on HRQoL, we examined employment, marital, and reproductive trajectories together. To the best of our knowledge only two previous studies examined employment and family trajectories simultaneously: McKetta et al. (2018) studied mortality rates in women and found five types of trajectories: “*nonworking, married, later-mothers*;

working divorced mothers; working and non-working, never-married mothers; working, never-married non-mothers; and nonworking, married earlier-mothers” (p. 301). The typologies *never-married mothers* as well as *working, never married, childless women* in comparison to *non-working, married, later-mothers* were linked to an elevated mortality risk.

van Hedel et al. (2016) examined cardiovascular risk in women and identified the following five life course typologies: *working single childless women, non-working married mothers, working single mothers, married mothers who returned to work after some non-employment, and working married mothers*. While some life courses were associated with worse health, overall, they could not determine a consistent pattern linking specific life course types to an elevated health risk.

It is noteworthy, that these two studies employed female only samples. However, both family and employment life courses are highly gendered (Helske et al., 2015; Wahrendorf et al., 2018): For example, typologies such as *entering a first partnership in later life* and *later multiple partners* are reported by men more than women (Helske et al., 2015) and *full-time employment ending in later retirement* is a more male dominated while *predominantly part-time employment* and *domestic work* are more female dominated life course typologies (Wahrendorf et al., 2018).

Giudici and Morselli (2019) examined the interaction of employment life course typologies and gender on health outcomes. Compared to men, women were more likely to report depressed mood in most employment versus vocationally inactive life courses, especially in full-time and double job trajectories. Women also reported worse self-rated health with frequent employment changes. Their findings stand in contrast to methodologies that examine single measurements of employment status, where men generally assign greater importance to employment and in turn report greater health detriments when non-traditional, instable employment is experienced (McKee-Ryan et al., 2005). This discrepancy stresses the importance of taking a life course – and so a holistic – approach. Therefore, we aim to:

1. Determine clusters of employment, marital, and reproductive life-course trajectories by means of sequence and cluster analysis.
2. Examine the associations of life course clusters with change in HRQoL.

Methodology

Data and Ethics

Data from the Core-Study of the German Socio-Economic Panel (GSOEP) was used. This is an annual representative longitudinal study of private households (Goebel et al., 2019). In the GSOEP some constructs, and indicators are measured annually (e.g., household structure, employment history, income), while others are measured once or at less frequent intervals (e.g., subjective mental and physical health).

Data collection began in West Germany in 1984 and directly after reunification in 1990 a sample of East German participants joined the panel. To reflect German society in the period since the reunification, we used data from 1990 to the most recent wave (i.e., 2019). As our focus lay on employment and family aspects, we concentrated on middle-aged persons and only included participants who were between 18 and 65 years old in each respective wave ($n=24,836$). Furthermore, to be able to determine sequences and not merely include individual states, participants with less than 50% complete data with respect to employment, partnership, and children in household were excluded ($n=28,888$).

This study is a secondary analysis of the GSOEP data; therefore, no additional ethical approval was needed. In the primary studies, all human studies were approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards and written informed consent was obtained from each subject (Goebel et al., 2019; Liebig et al., 2019). The data that support the findings of this study are available from German Institute for Economic Research (DIW). The current study protocols were approved by the (DIW). Data can be accessed following an application to the DIW: https://www.diw.de/en/diw_01.c.618953.en/the_institute.html.

Variables and Measures

Life Courses

Employment, marital, and reproductive states were examined as longitudinal sequences in annual intervals (1990–2019).

Employment Life Course The item “Are you currently employed? Which one of the following applies best to your status?” was used to measure employment status. The following four categories were formed: *full-time employment*, *regular part-time employment*, *non-employment*, and *other employment* (including: vocational training, marginally employed, near retirement, zero working hours, voluntary military service, voluntary services, sheltered workshop, internship, & completing compulsory military service / community service).

Marital Life Course Marital status was measured with the item “What is your marital status?”. The following categories were used: *married*, *separated* (response options: “married, separated”, “divorced, registered partnership dissolved”), and *single*.¹

Reproductive Life Course Three categories, using the item children currently living in the household, were formed: *no children*, *1 child*, and *2 or more children*.

¹ As this was not the focus of the current study and because we expected greater heterogeneity in homosexual person's life courses, we only focused on heterosexual individuals.

Change in Health-Related Quality of Life

The present study focuses on the concept of health-related quality of life, in the analyses the following three components of HRQoL are examined separately: general life satisfaction, subjective mental, and physical health.

General life satisfaction was measured using the items. How satisfied are you with your life overall?" (Schimmack et al., 2008). An 11-point scale of 0 (completely dissatisfied) to 10 (completely satisfied) was used, where higher values reflected greater satisfaction.

Subjective mental and physical health were measure using the SOEP-SF-12 (Nübling et al., 2006). The mental health subscale includes six items that measure mental health, emotional role functioning, social functioning, and vitality, while the physical health subscale contains six items that measure general health, physical fitness, bodily pain, and physical role functioning. General health is assessed on a 5-point Likert scale ([1] very good to [5] bad), the physical fitness items are assessed on a 3-point Likert scale ([1] greatly to [3] not at all), and the other items are measured on a 5-point Likert scale ([1] always to [5] never). Example items include: "Please think about the last four weeks. How often did it occur within this period of time, that due to mental or emotional problems you carried out your work or everyday tasks less thoroughly than usual?" (subjective mental health) and "...that you had strong physical pains?" (subjective physical health). Each subscale was scaled onto a value between 0–100, where higher scores represent better subjective health.

Change in HRQoL components (i.e., general life satisfaction, subjective mental, and physical health) were computed by subtracting each participant's baseline value from their last value in the time period 1990–2019.

Sociodemographic Variables

The last value in the time period 1990–2019 was used for *gender* (0 = male, 1 = female), *age* (years), *household income* (Euros ÷ 1000), *education* (ISCED-11 dummy coded: *low* [1–3], *moderate* [4–5] (reference), *high* [6–8]), and *region of residence* (0 = West Germany, 1 = East Germany).

Statistical Analysis

Sequence and Cluster Analysis Sequence analysis (SA) (Gauthier et al., 2010; Pollock, 2007) in women and men separately was used to establish the typical employment, marital, and reproductive life courses (see supplementary information 1 for an example of this statistical approach). This method allows life histories to be quantified by examining 'states' (e.g., employed full-time, employed part-time, not employed) and their respective changes from one state to another (e.g., not employed in 1992 to employed full-time in 1993). Missing data for

employment, marital, or reproductive states were coded as separate states (i.e., 'Missing').

By means of SA all sequences are compared pairwise to determine how similar they are to one another (Abbott, 1995). Optimal matching analysis is one of the most popular methods of SA, where the number of modifications that need to be made from one sequence to another (i.e., altering a state in each wave) determines sequence similarity. It also provides flexibility in setting the substitution costs. That is to say, individual sequences are considered similar if they are made up of similar states occurring at similar time points. Optimal matching produces a pairwise distance matrix, which shows the 'distance' between all possible pairs of individual sequences.

As we are examining employment, marital, and reproductive sequences simultaneously, we used multi-channel SA. The main difference between SA and multi-channel SA is that the latter takes into account the interaction between two or more domains by examining similarities between sequences in more than one domain (Gauthier et al., 2010; Ward, 1963). That means that two individual sequences are only considered similar if the states in all domains are similar and experienced at similar time points. The three channels were weighted equally.

Once sequence similarity was established, we clustered sequences that were more similar to one another and determined typologies. For this we employed Ward cluster analysis (Ward, 1963). The Ward method is a hierarchical clustering algorithm that joins the two least distant groups at each step. It is the preferred clustering method as it aims to minimize within cluster discrepancies (Gauthier et al., 2010). We examined the two- to 15-cluster options. To determine the most appropriate number of clusters we examined the dendrograms, and the cluster cut-off criteria (Average Silhouette Width [ASW] & Point Biserial Correlation [PBC]; higher values indicate higher quality partitions; (Hennig & Liao, 2010; Studer, 2013)). We conducted sensitivity analyses with different waves of the data, to ensure robustness of the clusters.

Descriptive Statistics Data was examined across gender (male, female), and life course clusters using *t*-tests, ANOVA, Tukey HSD post-hoc-tests, and chi-square tests. To describe the life course clusters we also used Shannon's entropy ("the 'uncertainty' of predicting the states in a given sequence"; (Gabadinho et al., 2011a, p. 78)), and Elzinga's turbulence (the amount of states and state changes; (Elzinga & Liefbroer, 2007)).

Hierarchical Linear Regression Analyses (HLR) To examine the associations between life course clusters and change in HRQoL, *HLR* models were run separately for gender (i.e., male, female) and HRQoL outcomes (i.e., life satisfaction, subjective mental, and physical health). Life course cluster was entered as the predictor variable, the respective HRQoL baseline variable was entered as the control variable, and change in HRQoL was considered the outcome variable. In a next step Tukey HSD post-hoc-tests, which corrects *p*-values for multiple testing, were performed to examine all potential cluster contrasts.

All analyses were conducted with the statistical software *R* version 3.6.2 (R Core Team, 2019), along with the libraries *car* (Fox & Weisberg, 2019) to relevel the categorical variables, *TraMineR* (Gabadinho et al., 2011b) for the multichannel SA and visualisation of the life course clusters, *cluster* (Maechler et al., 2019) for cluster analysis, *lm* to run the HLRs, *multcomp* (Hothorn et al., 2008) to run the Tukey HSD post-hoc tests, *broom* (Robinson et al., 2020) and *DescTools* (Signorell et al., 2021) to summarise the output, *emmeans* (Searle et al., 1980) to extract the predicted values, and *ggplot2* (Wickham & Chang, 2015) to visualise the predicted values and results from the post-hoc-tests.

Results

The sample comprised 8,998 persons (52.52% female), with a mean age of 53.57 years ($SD=9.60$; see Table 1). Compared to women, men were older and reported higher education. Men also reported better subjective mental and physical subjective health, but lower life satisfaction.

Life-Course Clusters

See supplementary information 2 for the substitution cost matrices, the ten most frequent sequences for the employment, marital, and reproductive sequences, entropy and turbulence values, dendrograms, and cluster cut-off criteria. See Fig. 1 for individual employment, marital, and reproductive sequences.

For the female sample, the dendrogram favoured the four- to six cluster options. Of the cluster cut off criteria, the highest ASW-values were seen for the two-, three-, and five-cluster options, while the highest PBC-value was seen for the five-cluster option. The sensitivity analyses confirmed the robustness of the five-cluster option.

The first female life course cluster '*getting employed, married, & 2+ children*' ($n=885$, 18.73%) was characterised mainly by transitions from non- or other to part-time employment around 2002. Most individuals in this cluster had two or more children. The second female cluster '*single & no children*' ($n=928$, 19.64%) was characterised by singledom and having no children living in the household. It also showed numerous changes in employment states. The third cluster '*employed, married & 1 child*' ($n=1894$, 40.08%) was the largest cluster, making up 40% of the female sample. Most women in this cluster were either in part- or full-time employment, were married, and had one child living with them. The fourth female cluster '*separated*' ($n=474$, 10.03%) was the smallest cluster and was characterised by marital separation. Women in this cluster showed numerous employment transitions and generally had two or more children living with them. The fifth cluster '*starting a family*' ($n=545$, 11.53%) was the second smallest cluster and was characterised by women who got married and had children around 2000. Also, around this time they were not employed and mainly re-entered part-time employment around 2010. The female life-course clusters generally show high turbulence for employment compared to marriage, and some extent children, sequences. Cluster 1 '*getting*

Table 1 Descriptive statistics of the total sample and by gender ($N=8,998$)

		total		female		male		Difference test by gender
		<i>M</i> / <i>n</i>	<i>SD</i> / %	<i>M</i> / <i>n</i>	<i>SD</i> / %	<i>M</i> / <i>n</i>	<i>SD</i> / %	
Age	(years)	53.57	9.60	53.28	9.71	53.90	9.46	**
Household income	(€ ÷ 1000)	3.25	3.05	3.20	3.60	3.29	2.28	
Region	East	2496	28.08	1310	28.01	1186	28.16	
	West	6392	71.92	3367	71.99	3025	71.84	
Education	low	4132	57.80	2296	60.44	1836	54.81	***
	moderate	997	13.95	466	12.27	531	15.85	
	high	2020	28.26	1037	27.30	983	29.34	
Subjective health	mental	49.67	10.03	48.97	10.24	50.45	9.72	***
	physical	48.43	9.45	48.17	9.54	48.72	9.34	**
Life satisfaction	general	6.95	1.78	7.00	1.78	6.88	1.78	**
<i>n</i> / %		8998	100.00	4726	52.52	4272	47.48	

* $p < .05$ ** $p < .01$ *** $p < .001$ *M* = mean, *n* = case number, *SD* = standard deviation, % = percent

employed, married, & 2 + children', and C3 'employed, married & 1 child' showed the lowest turbulence and entropy, while the highest values were seen for C5 'starting a family'.

For the male sample, the dendrogram favoured the three- to six-cluster options. Of the cluster cut off criteria, the highest ASW-values were seen for the two- to six-cluster options, while the highest PBC-values were seen for the four- to seven-cluster options. The six-cluster option proved most robust following the sensitivity analyses.

The first male life course cluster 'entering employment, single & no children' ($n=891$, 20.86%) is mainly characterised by singledom and not having children throughout. Men in this cluster also transition from other or non-employment to full-time employment around 2010. The second male cluster 'leaving employment & married' ($n=1066$, 24.95%) is characterised by becoming not employed by around 2003. These men were also mainly married and had no children living in the household. The third male cluster 'separated' ($n=372$, 8.71%) was the smallest and was characterised by marital separation and children moving out by around 2000. These men were mainly in full-time employment, although some also showed sequences of non-employment. The fourth male cluster 'married & children moving out by 2005' ($n=834$, 19.52%) showed men who were mainly in full-time employment, married, and their children moved out by around 2005. The fifth male cluster 'starting a family' ($n=400$, 9.36%) was characterised by getting married and having children by around 2000. These men were mainly in full-time employment, while some were in other or non-employment before 2000. The sixth cluster 'married & children moving out by 2010' ($n=709$, 16.60%) showed similar trajectories to cluster 4, except that the children moved out later, namely by around 2010. Cluster 4 'married &

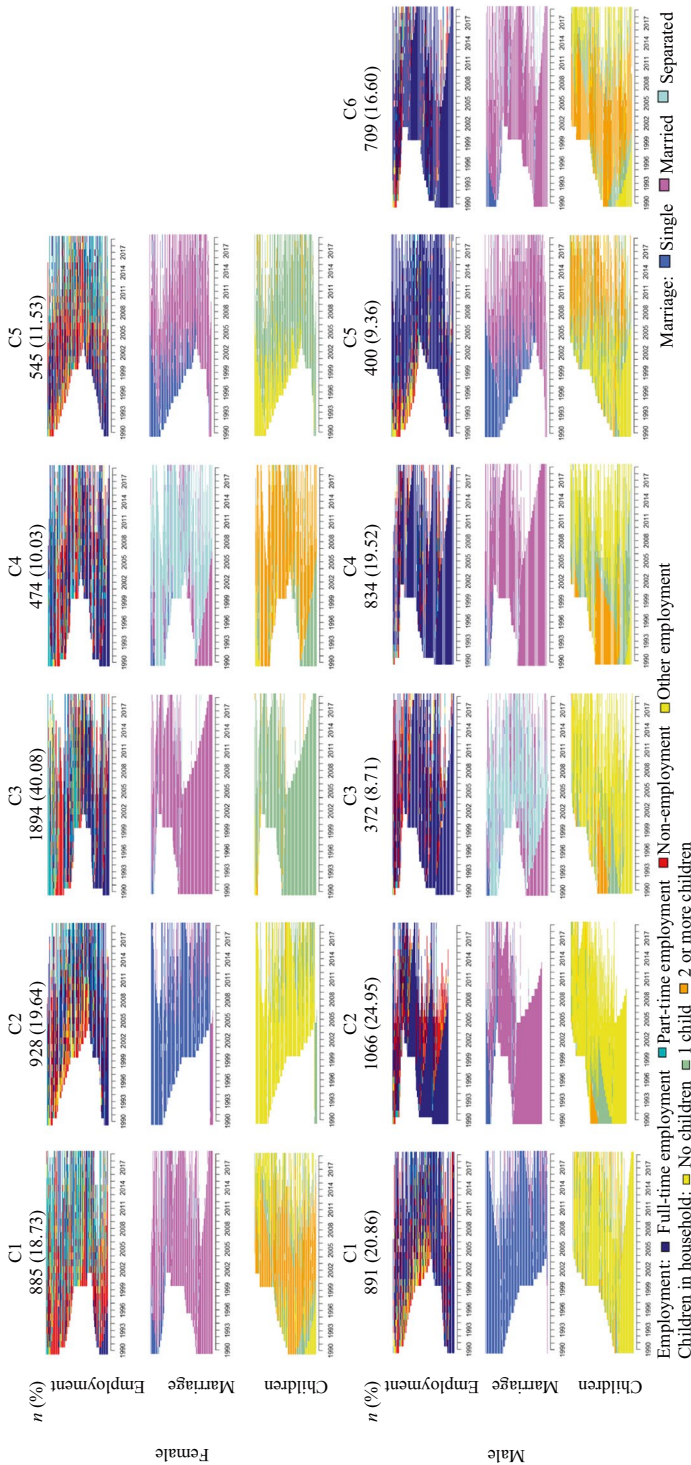


Fig. 1 Employment-family life course clusters separate by female ($n=4,726$) and male ($n=4,272$) sample *Note.* Female typologies: C1= 'getting employed, married, & 2+ children', C2= 'single & no children', C3= 'employed, married & 1 child', C4= 'separated', C5= 'starting a family'. Male typologies: C1= 'entering employment, single & no children', C2= 'leaving employment & married', C3= 'separated', C4= 'married & children moving out by 2005', C5= 'starting a family', C6= 'married & children moving out by 2010'.

children moving out by 2005', and C6 'married & children moving out by 2010' showed the lowest turbulence in employment and marital states. Also, turbulence values for the children sequences increased from cluster 1 to 6.

Associations with Sociodemographic Background

Both the female and male life course clusters differed significantly regarding sociodemographic background (Table 2). In both the male and female samples, the 'single', and 'starting a family' clusters were youngest, while the 'separated' clusters were oldest. In the female sample, C1 'getting employed, married, & 2+children', and C5 'starting a family' showed the highest, while in the male sample C2 'leaving employment & married', and C3 'separated' the lowest household income. The female C1 'getting employed, married, & 2+children' consisted of the highest proportion of East German residents, while the male C6 'married & children moving out by 2010' of the lowest proportion. The female C3 'employed, married & 1 child' comprised the highest proportion of individuals with higher education, while the male C3 'separated' comprised the lowest proportion of individuals with moderate education as well as the highest proportion of individuals with low education.

Associations with Change in Health-Related Quality of Life

Below we highlight some of the findings from the HLR analyses and Tukey HSD post-hoc tests (see Figs. 2 & 3).

First we examined the results for the female sample: The HLM with life satisfaction ($F(5, 4565)=497.2, p<0.001, R^2=0.35$) showed significant associations with the baseline values ($b=-0.60, p<0.001$). Compared to C3 'employed, married & 1 child', which showed a deterioration in life satisfaction, C1 'getting employed, married, & 2+children' ($b=0.10, p=0.002$), C2 'single & no children' ($b=0.12, p<0.001$), and C5 'starting a family' ($b=0.17, p<0.001$) showed stability. The post-hoc test confirmed, for instance, that C3 'employed, married & 1 child' showed a greater deterioration in life satisfaction as compared to C1 'getting employed, married, & 2+children'. Also C4 'separated' showed a greater deterioration in life satisfaction compared to C5 'starting a family'.

The HLM with subjective mental health ($F(5, 4349)=397.4, p<0.001, R^2=0.31$) showed significant associations with the baseline values ($b=-0.56, p<0.001$). Compared to C2 'single & no children' ($b=-0.07, p=0.03$), and C5 'starting a family' ($b=-0.09, p=0.03$), C3 'employed, married & 1 child' showed greater improvement in subjective mental health. The post-hoc test revealed no significant differences across the life course clusters.

In respect to the HLM with subjective physical health ($F(5, 4349)=250.9, p<0.001, R^2=0.22$), the baseline values showed a significant negative association ($b=-0.49, p<0.001$). Parallel to the findings with life satisfaction, compared to C1 'getting employed, married, & 2+children' ($b=0.19, p<0.001$), C2 'single & no children' ($b=0.35, p<0.001$), and C5 'starting a family' ($b=0.36, p<0.001$), C3

Table 2 Sociodemographic variables by employment, marital, and reproductive life-course cluster (N= 8,998)

Female			C1			C2			C3			C4			C5					
	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %				
Age (years)	51.37	6.66	44.67 ^a	9.34	59.71	6.70	57.14	7.45	45.37 ^a	6.56										
Household income (£ ÷ 1000)	3.85 ^c	2.46	3.17 ^b	2.11	2.94 ^{ab}	2.00	2.48 ^b	9.31	3.74 ^c	1.96										
Region	646	34.62	154 ^a	17.40	257	28.21	129 ^{ab}	27.27	124 ^b	22.88										
Education	1220	65.38	731	82.60	654	71.79	344	72.73	418	77.12										
	916	65.62	508	67.20	328 ^a	41.89	260 ^a	67.36	284	59.41										
	116	8.31	98	12.96	130	16.60	31	8.03	91	19.04										
	364	26.07	150	19.84	325	41.51	95	24.61	103	21.55										
n / %	885	18.73	928	19.64	1894	40.08	474	10.03	545	11.53										
Male			C1			C2			C3			C4			C5			C6		
	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %	M / n	SD / %
Age (years)	45.26 ^a	9.06	60.16	7.71	58.17 ^b	6.74	57.58 ^b	6.78	46.29 ^a	5.74										
Household income (£ ÷ 1000)	3.13 ^b	2.65	2.83 ^a	1.95	2.53 ^a	1.89	3.39 ^b	1.93	3.98 ^c	2.00										
Region	349 ^{a-c}	34.25	25 ^{b,e}	28.39	115 ^{a,d,f}	31.17	265 ^{b,c,e,f}	31.85	93 ^c	23.37										
Education	670	65.75	633	71.61	254	68.83	567	68.15	305	76.63										
	385 ^{a-c}	58.96	400 ^{d,e}	51.48	188 ^d	65.05	382 ^{a,c,e,f}	56.18	164 ^{b,f,g}	46.99										
	83	12.71	122	15.70	33	11.42	103	15.15	73	20.92										
	185	28.33	255	32.82	68	23.53	195	28.68	112	32.09										
n / %	891	20.86	1066	24.95	372	8.71	834	19.52	400	9.36										

^{a-e} denote non-significant effects ($p > .05$). Differences across clusters were examined with ANOVAs, post-hoc Tukey, and chi-square tests. Female typologies: C1 = 'getting employed, married, & 2+ children', C2 = 'single & no children', C3 = 'employed, married & 1 child', C4 = 'separated', C5 = 'starting a family'. Male typologies: C1 = 'entering employment, single & no children', C2 = 'leaving employment & married', C3 = 'separated', C4 = 'married & children moving out by 2005', C5 = 'starting a family', C6 = 'married & children moving out by 2010'.

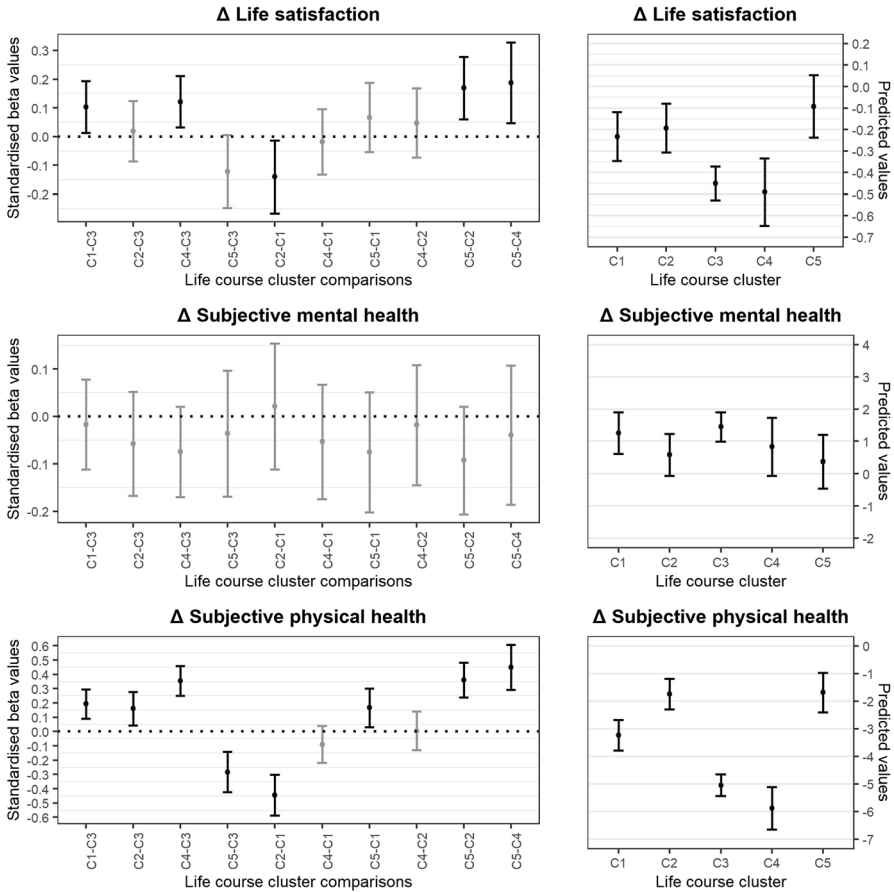


Fig. 2 Predicted values from the hierarchical linear regression analyses and results from the Tukey HSD post-hoc-tests in the female sample ($n=4,726$). *Note.* C1 = ‘getting employed, married, & 2+ children’, C2 = ‘single & no children’, C3 = ‘employed, married & 1 child’, C4 = ‘separated’, C5 = ‘starting a family’. Significant Tukey HSD post-hoc contrasts are coloured black ($p < .05$). Analyses are controlling for baseline values of health-related quality of life

‘employed, married & 1 child’, showed a deterioration in subjective physical health. The post-hoc test for subjective physical health confirmed this finding. Also, C4 ‘separated’ showed a greater deterioration in subjective physical health compared to C5 ‘starting a family’.

Next we examined the findings in the male sample: The HLM with life satisfaction ($F(6, 4100) = 324.8, p < 0.001, R^2 = 0.32$) showed significant negative associations with the baseline values ($b = -0.57, p < 0.001$). Compared to C1 ‘entering employment, single & no children’, C5 ‘starting a family’, and C6 ‘married & children moving out by 2010’, C2 ‘leaving employment & married’ showed a greater deterioration in life satisfaction. The post-hoc test showed, for example, the highest stability in life satisfaction for C5 ‘starting a family’, compared to C2 ‘leaving

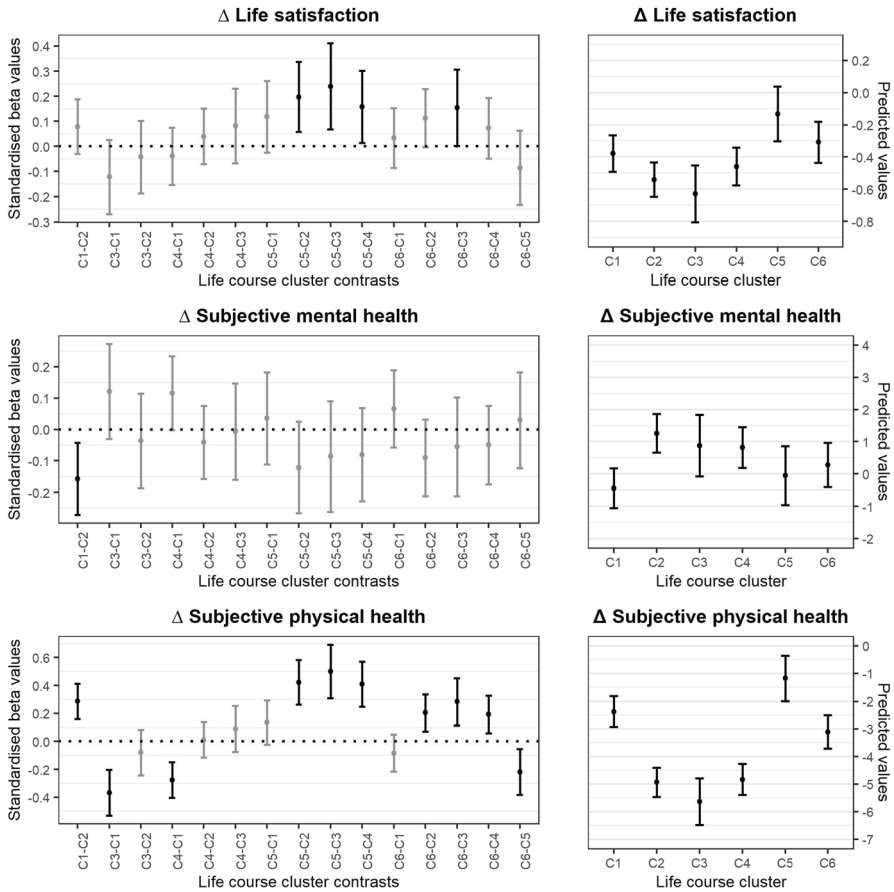


Fig. 3 Predicted values from the hierarchical linear regression analyses and results from the Tukey HSD post-hoc-tests in the male sample ($n=4,272$). Note. C1 = ‘entering employment, single & no children’, C2 = ‘leaving employment & married’, C3 = ‘separated’, C4 = ‘married & children moving out by 2005’, C5 = ‘starting a family’, C6 = ‘married & children moving out by 2010’. Significant Tukey HSD post-hoc contrasts are coloured black ($p < .05$). Analyses are controlling for baseline values of health-related quality of life

employment & married’, C3 ‘separated’, and C4 ‘married & children moving out by 2005’, which showed deteriorations in life satisfaction.

The HLM with subjective mental health ($F(6, 3889) = 285.6, p < 0.001, R^2 = 0.30$) showed a significant association with the baseline values ($b = -0.55, p < 0.001$). Contrary to the findings with life satisfaction, compared to C1 ‘entering employment, single & no children’, C5 ‘starting a family’, and C6 ‘married & children moving out by 2010’, C2 ‘leaving employment & married’ showed a greater improvement in subjective mental health. The post-hoc test confirmed that, compared to C1 ‘entering employment, single & no children’, C2 ‘leaving employment & married’ showed greater improvement in subjective mental health.

The HLM with subjective physical health ($F(6, 3889)=156.3, p<0.001, R^2=0.19$) showed a significant association with the baseline values ($b=-0.46, p<0.001$). Similar to the findings with life satisfaction, compared to C1 'entering employment, single & no children', C5 'starting a family', and C6 'married & children moving out by 2010', C2 'leaving employment & married' showed a greater deterioration in subjective physical health. The post-hoc test further showed that C1 'entering employment, single & no children', and C5 'starting a family' showed greater stability compared to C2 'leaving employment & married', C3 'separated', and C4 'married & children moving out by 2005', which showed greater decline. Also, C6 'married & children moving out by 2010' showed high stability compared to C2, C3, and C4; however was less stable than C5 'starting a family'.

Discussion

The present study examined clusters of employment, marital, and reproductive life courses, and their associations with change in HRQoL in women and men. Bearing in mind the importance of HRQoL in the assessment and evaluation of psychological and general health treatments (Huppert & So, 2013), preventative practice can target groups who experience certain life styles.

Despite changing attitudes towards gender roles and increasing female participation in the work force (Stavrova et al., 2012), our findings reiterated that how we lead our life is highly gendered in areas of employment and family. Life courses regarding employment still differ greatly regarding employment aspects, where men generally work full-time while women work part-time and experience frequent employment transitions. Similarly, Wahrendorf et al. (2018) found that *full-time employment ending in later retirement* was a more male dominated whereas *pre-dominantly part-time employment* and *domestic work* were more female dominated life course typologies. We found that while similar life course sequences were seen across genders regarding family aspects – e.g., starting a family or marital separation – they still differed in the particulars: For instance, only for men marital separation was followed by the children moving out of the household, while for women starting a new family was coupled with a break from employment.

Departing from the traditional gender roles of breadwinners versus homemakers, feminist theories purport a more nuanced, gendered perspective, where, for instance, unpaid housework may be considered an act of love and an equal contribution to paid work (e.g., Thompson & Walker, 1989). The female life course typology that appears to integrate work and family – i.e., *employed, married & 1 child* – also shows one of the largest deteriorations in HRQoL. Similarly Tomczyk et al. (2021) found that time spent on household chores and childcare continues to mainly be performed by women, which ultimately reflects in poorer health outcomes. Thus, it is fair to say, that women who aim to fulfil expectations on two fronts – i.e., work and family – ultimately pay a larger health cost.

In line with the large body of research that stresses the negative health effects of unemployment (McKee-Ryan et al., 2005), we found that for women 'becoming employed' – albeit part-time – was clearly related to an improvement in HRQoL and

for men ‘entering non-employment’ was related to a steeper decline in subjective physical health. However, for men ‘entering non-employment’ compared to ‘leaving non-employment and becoming employed’ was also related to an improvement in subjective mental health, as if to suggest a relief from work stressors. These ambiguous findings with HRQoL of the two male non-employment typologies underlines the merit of the sequence and cluster analysis method, as this would not have been picked up by cross-sectional approaches.

A critical life event that seemingly affects men and women similarly – healthwise – is marital separation. Previous research stressed the importance of a steady partnership (Brazil & Clark, 2017). Beyond showing a great deterioration in HRQoL, individuals in the separated typologies also reported a lower household income and showed instability in employment trajectories. This indicates that marital separation may be followed by other – e.g., employment-related – critical life events or, alternatively, be a result of these life changes. Either way, this underlines the importance that health campaigns target populations who have separated from a spouse, as this may indicate imminent health deteriorations.

Finally, while life experiences are seen as vital during the diagnostic phase of mental illness (König et al., 2018), we only saw few associations with subjective mental health. This aligns with research that found that life events are related to short-term effects on mental health (Suh et al., 1996). Instead, we found distinct associations between life course typologies, and life satisfaction, as well as subjective physical health, which highlights the importance of targeting these groups in preventative campaigns for not only mental but also – or even more so – physical illness.

Strengths, Limitations, and Future Directions

One major strength of the present study was that it examined types of employment, marital, and reproductive trajectories rather than sociodemographic variables at a specific time point in relation to HRQoL. This acknowledges the dynamic processes of life experiences, especially in relation to health. The contradictory findings with HRQoL of the two male non-employment typologies, underlines the merit of this approach. Future research may want to examine the role of psychosocial resources (e.g., optimism or social support) in the relationship between life-course experiences, and HRQoL.

Naturally, our study is not without its limitations. We used a large but not representative dataset based on self-reports. While this is important to capture the subjective experience of life courses and connect it to subjective attitudes, it may also be biased, thus inflating correlations between data (i.e., method bias).

Also, we examined change in HRQoL by considering personal baseline and end values, which neglects possible period effects. However, the advantage of the present approach is, first, that it minimises the exclusion of participants who may not have been part of the panel at a set end point (e.g., 2019), and so, second, avoids having to test the associations with HRQoL of a subset that may not be representative of membership of the life-course clusters.

Conclusions

This study identified male and female typologies of employment, marital, and reproductive life courses in the general population, that showed distinct sociodemographic profiles, and associations with indicators of HRQoL. Certain life courses – e.g., entering non-employment and marital separation – appear to go hand in hand with a decline in subjective physical health, and life satisfaction, but – contrary to previous studies – less with mental health. We thus propose for health diagnostics and treatments to especially target groups with the identified ‘at risk’ life experiences.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11482-022-10130-3>.

Funding Open Access funding enabled and organized by Projekt DEAL. This work was financially supported by the German Federal Ministry of Education and Research, Berlin [grant number 01UJ1911DY]. The funder had no involvement in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Data Availability This study is a secondary analysis of the German Socio-Economic Panel data (Goebel et al., 2019; Liebig et al., 2019). The data that support the findings of this study are available from German Institute for Economic Research and can be accessed following an application: https://www.diw.de/en/diw_01.c.618953.en/the_institute.html.

Declarations

Competing Interests The authors have no employment, financial, non-financial or other competing interests to declare.

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