Journal of Happiness Studies (2023) 24:275–307
https://doi.org/10.1007/s10902-022-00600-8

RESEARCH PAPER

The Role of Parenthood for Life Satisfaction of Older Women and Men in Europe

Gerrit Bauer[1] · **Martina Brandt**[2] · **Thorsten Kneip**[3]

Accepted: 25 October 2022 / Published online: 8 November 2022

Abstract
Previous research has widely addressed the gap in well-being between parents and childless individuals. While cross-sectional studies have regularly reported lower levels of well-being for parents, recent longitudinal studies suggest a short-term positive effect with a back-to-baseline adaptation. Whether, why, and how parenthood may affect well-being in older age is, however, still largely unclear. In this paper, a holistic view of well-being developments across the process of aging is combined with a transition-centered, gender sensitive approach to analyze the effects of health decline on the self-reported life satisfaction of parents and childless individuals. Life satisfaction in older age is hypothesized to be influenced by the onset of and coping with health limitations, which themselves may differ by parental status and gender. Using group-specific growth curve analysis based on data from the Survey of Health, Ageing and Retirement in Europe (SHARE) and accounting for selection into parenthood, we demonstrate how the life satisfaction of men and women evolves in the later life depending on parental status. Results show that from age 50 onwards, parents' life satisfaction develops somewhat less favorably compared to that of childless individuals, but this difference is not significant. However, fathers' health evolves more favorably while they react less negatively to health limitations than childless men. Our results thus suggest that children are a source of social control with long-term positive effects on health and a coping resource in the face of health limitations for fathers but not for mothers.

Keywords Parents · Children · Well-being · Life satisfaction · Growth curve analysis · Health · SHARE

✉ Thorsten Kneip
kneip@mea.mpisoc.mpg.de

[1] Department of Sociology, LMU Munich, Munich, Germany

[2] Department of Social Sciences, TU Dortmund, Dortmund, Germany

[3] Munich Center for the Economics of Aging, Max Planck Institute for Social Law and Social Policy, Munich, Germany

1 Introduction

Until recently, the "parental happiness gap" was one of the big puzzles in empirical research on well-being (Kohler & Mencarini, 2016). Despite the firm and untested common belief that parents should be happier than childless individuals (Hansen, 2012), "almost all empirical studies on the association between parenthood and subjective well-being, however, have ascertained that parents of minor children are no happier or are even less happy than childless people" (Pollmann-Schult, 2014, p. 319). Mothers, in particular, were shown to "suffer in paradise" (César et al., 2018). Along with the "regretting motherhood" movement (Donath, 2015), such studies have attracted a lot of public attention. Research identifying negative effects of parenthood are mainly based on between-comparisons; in other words, comparisons of parents with childless individuals. The differences found in these studies are likely not entirely due to parenthood, but also to other unobserved factors that influence (self-)selection into parenthood. In contrast, studies relying on panel data and within-comparisons (i.e., changes in well-being for the same respondent before and after the birth of the first child) report short-term positive effects (e.g. Myrskylä & Margolis, 2014). In the medium term, the transition to parenthood appears to have neither a lasting positive nor negative effect on life satisfaction, which might be at least partly due to adaption processes (see e.g. Clark & Georgellis, 2013).

There are still many open questions about differential mechanisms within different parenting contexts, both methodologically as well as substantially, not least from a life course perspective (Nomaguchi & Milkie, 2020). How well-being trajectories evolve over time, especially in old age when the role of children for their parents might change dramatically, is for example still unknown. Generally, well-being trajectories seem to follow a clear age pattern: In mid-life, when many transition to parenthood, different individuals report different (arbitrary) levels of well-being, but the well-being trajectory over age is more or less flat (when health is controlled for, e.g. Gwozdz & Sousa-Poza, 2010) or decreases slightly (when health is not controlled for, e.g. Kratz & Brüderl, 2021). In older age, and after a possible "retirement hump" (e.g. Horner, 2014), well-being decreases continuously, presumably as limitations due to declining health increase (e.g. Borg et al., 2006).

It is likely that differences between parents and childless individuals in this decline are present if children constitute an investment that pays off at this later stage of life. Becoming a parent might thus be linked to lower initial levels of well-being (e.g., due to parenting stress, economic strains, etc.), but may be an investment in future well-being and an insurance against loneliness and lack of support later in life. This argument is also in line with the few studies showing that the "parental happiness gap" diminishes with age and eventually becomes positive (see Hansen, 2012; Stanca, 2012). Moreover, having children may impact the behavior of (mid-age) parents, which could have a positive effect on their well-being trajectory in later life. Alternatively, becoming a parent may have cost a significant amount of resources and causing stress, which would have a negative impact on health development in old age (Pripp et al., 2010; Umberson, 1987).

Age trajectories are also likely to vary considerably between men and women. Related to gendered (care, family, work) roles, the costs and returns to investments of children may be unequally shared between fathers and mothers at different stages of the life course (e.g. Bianchi, 2000). Moreover, men and women differ in their levels of life satisfaction as well as in their vulnerability and exposure to many relevant dimensions such as health decline or supportive networks in older age (e.g. McLaughlin et al., 2010; Schmitz & Brandt, 2019).

In the following, we draw upon (in part inconclusive) results of previous research (for an overview see Nomaguchi & Milkie, 2020) and ask: How does well-being develop for parents and childless men and women in later life? How do the well-being trajectories of parents differ from those of childless individuals? This analysis thus examines whether parenthood affects the development of well-being in terms of life satisfaction in older age. Further, it investigates whether possible differences in well-being trajectories can be explained (or are obscured) by differences in the *incidence* of health-related limitations in older age or by differences in individuals' responses to these limitations. Children might attenuate negative consequences of the onset of disruptive health events in older age as they constitute a source of socio-emotional and instrumental support to their older parents. At the same time, health itself may be a consequence of parental status and related life styles earlier in life. Rich longitudinal data from the Survey of Health, Ageing and Retirement (SHARE) are utilized in order to assess whether the earlier "parental happiness gap" may become a "parental happiness premium" in later life when observing life (satisfaction) trajectories of parents and childless individuals aged 50 and over across Europe.

2 Theoretical Background and Empirical Findings: Pathways to Life Satisfaction of Parents and Childless Individuals in Older Age

Research on the "parental happiness gap" has been criticized due to the fact that the causal effect of children on parental well-being is neither theoretically nor empirically well defined. When assuming rational, well-informed actors, one would expect no differences in the life satisfaction of individuals who have deliberately decided to have children from that of those who have deliberately decided not to have children (Deaton & Stone, 2014). The key point here is that the choice to become a parent is a function of the *expected* effectiveness and efficiency of children as a *means* of generating well-being.

One may argue that at the time decisions surrounding family formation are made, individuals are hardly able to fully assess or evaluate the consequences, which occur many years or decades later. Nevertheless, the *expected* insurance utility from children for maximizing parents' comfort in old age features prominently in the "value of children" (VOC) literature (Nauck, 2014). One reason for *ex post* incorrect beliefs is rooted in *unforeseen* shocks. Actual well-being trajectories will then deviate from expected trajectories. In reaction, inventive actors will try to adapt to the new situation by searching for substitutes. However, they may not be able to find one equally effective and efficient. For example, parents confronted with their child unexpectedly moving abroad may increasingly invest in extended kin or friendship relations–who may be less committed than children.

For the sake of completeness, even with correct beliefs about the future, people may differ in their future orientation (or time preferences), in particular the degree to which they prefer immediate compared to future well-being (Frederick et al., 2002). The more an individual discounts the future, the more willing they are to accept lower life satisfaction in old age in favor of higher satisfaction at a younger age.

Both mechanisms (i.e., imperfect information/false beliefs and low future orientation/myopia) may thus impact the way in which well-being develops in later life–and differently so for parents and childless individuals if they differ systematically in their beliefs or future orientation. This could be the case if those with over-optimistic beliefs about adult children's supportiveness, over-pessimistic beliefs about their own care dependency in old age, or higher future orientation are more likely to become parents. Against the backdrop

of these assumptions, which imply an image of man as resourceful, restricted, expecting, evaluating, and maximizing (Lindenberg, 1985), the following sections elaborate the various pathways through which the effects of parenthood on well-being in old age might unfold.

2.1 *Pathways* via *Health Over the Life Course*

Physical decline and limitations due to declining health status have a negative impact on life satisfaction as physical well-being is an essential factor in the production of overall well-being (Lindenberg, 1989; Smith, 1776). Two opposing mechanisms provide explanations for both slowing down and accelerating the deterioration of parents' health over time in order to explain why parenthood may affect the health-age profile many years or even decades after the birth of a child (see Fig. 1).

(a) Having children may slow down age-related health decline via health behavior (e.g., healthy nutrition, regular sleep, physical exercise, abstaining from alcohol, tobacco, and other drugs). Durkheim (1951) stated that parenthood (and marriage) integrates individuals into society and that having children structures a parent's daily life, providing them with regular obligations. This commitment to the well-being of one's children can positively influence the health behavior of both mothers and fathers. According to a theoretical model proposed by Umberson (1987), *social control* and health behavior mediate the effect of having children on physical health and mortality. In short, social control increases with family relationships and affects health behavior both indirectly through the internalization of norms and through positive role models, and directly through sanctions (c.f. Umberson, 1987). Some of these social processes take place when children and parents are young. Positive health behaviors in mid-life generate "health capital" (Grossman, 1972), which pays off later in life by slowing down age-related health decline. Moreover, adult children can still remind their older parents to adopt positive health behaviors. These mechanisms open up possibilities for unexpected long-term effects of children on health and well-being that occur as a byproduct of behavior that is primarily oriented toward children's well-being.

(b) While social control could have unforeseen positive effects on health trajectories via health behavior, the *stress argument* predicts the opposite. Parenting may relate to psychological distress, as stressful conditions are often associated with parenting young children (Umberson & Williams, 1999, p. 245), especially for mothers. Such stressors are hardly predictable and likely underestimated (Kravdal, 2014). As female labor force participation

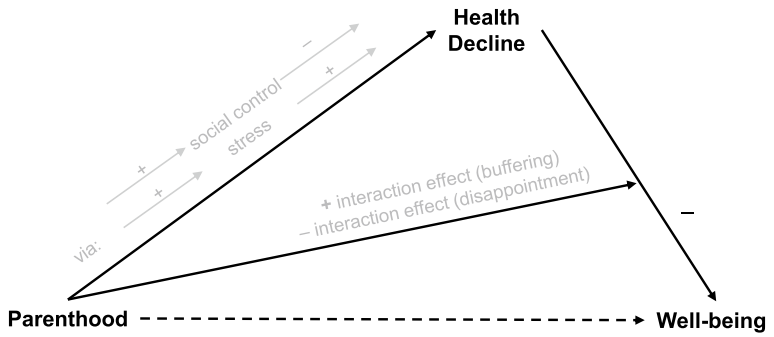

Fig. 1 Analytical frame

increases while women remain the predominant caregivers within families (Bianchi, 2000), conflicts between work and family life are among the most significant stressors today (Umberson et al., 2010, p. 618). Stressful parenting experiences and family-work strain not fully anticipated could lead to a steeper health-related decline for parents compared to their childless counterparts.

2.2 *Pathways* via *Parenthood and Supportive Networks*

A second set of hypotheses is related to social networks, which might moderate the effect of health decline on life satisfaction. In the second half of life, intergenerational relations and support flows change fundamentally (e.g. Mudrazija, 2014). With increasing age, close (family) relations become more important for older individuals (Wrzus et al., 2013). This might be an active decision due to a change in needs ("socio-emotional selectivity"; Carstensen, 1992), or also a passive experience due to changes in the personal "convoy" along with life events such as the death of a partner (Antonucci et al., 2014). Close confidants not only constitute an important source of potential instrumental support, but often also provide the companionship needed in older age (Hoffmann & Hoffmann, 1973).

(c) As friendship networks tend to thin out in old age, adult children constitute the most important support network for older parents (Deindl & Brandt, 2017). These relationships might *buffer* the negative effects of health decline on life satisfaction.

(d) However, a negative consequence for well-being might occur if no support is available from adult children in the case of illness or need for care. The effects of health-related limitations on life satisfaction could therefore be amplified by the *disappointment* from the lack of expected returns from investment in children. These unfulfilled hopes and expectations might impact life satisfaction the most, partly due to the lack of adaptive strategies (see Easterlin, 2005; Loewenstein & Schkade, 1999).

Buffering or disappointment effects may thus occur in the face of false beliefs about children's supportiveness (relative to extended kin or friendship networks) or if need for care in old age is over- or underestimated. The reason is simply that people living longer than expected profit more than expected from any support given.

2.3 Empirical Findings: Gender, Parenthood and Well-being

A large body of research deals with the general links between social networks and health in later life, showing that social relations influence well-being in different ways and on different levels (Deindl et al., 2016), with substantial differences between men and women (Fuhrer et al., 1999, 2002). Across Europe, older individuals who mainly confide in their children reported the highest levels of well-being (Litwin & Stoeckel, 2014), and older parents reported better mental health than their childless counterparts (Buber & Engelhardt, 2008)–even though childless individuals seemed to (at least partly) compensate their lack of children with their support network (Deindl & Brandt, 2017). Among the childless, gender differences are evident in such compensatory mechanisms: Childless men are more likely to compensate for the lack of informal support provided by adult children with formal service providers than are childless women. The latter, also commonly referred to as the "kinkeepers" of the family (Rosenthal, 1985), seem to invest more in broader informal support networks than their male counterparts (McLaughlin et al., 2010). Moreover, research shows that the effect of social ties and support on mortality is stronger for men than for women, which could be attributed to differences in gender roles (Shye et al., 1995;

Umberson, 1987). In addition, a large number of studies have recently looked at the effects of the double, and even triple burden on mothers that includes young (grand-)children, older parents, and employment (e.g. Bucher-Koenen et al., 2020; Herlofson & Brandt, 2020; Martire & Stephens, 2003; Vlachantoni et al., 2020), which may result in long-term health effects (Ridker et al., 2000). All in all, men and women do not only differ in their life situations and exposure to different risk factors concerning (mental) health in different contexts, but also in their reactions to them (e.g. Schmitz & Brandt, 2019).

The findings concerning the differential well-being effects of mother- and fatherhood are, however, inconclusive and the (possibly competing) mechanisms still very much under discussion, especially when analyzed in different contexts and over time (see e.g. Mu & Xie, 2016; Musick et al., 2016; Nelson-Coffey et al., 2019; Radó, 2020; Yu et al., 2019). They have also rarely been assessed systematically for parents in late life (but see e.g. Hank & Wagner, 2013; Umberson et al., 2010). From a theoretical perspective, however, these studies do not take into account that child-related stressors (in family and work) and benefits are (at least partially) expected. Thus, differences in realized costs and benefits cannot be used to infer differences in well-being. Rather, it is unexpected changes that matter, for example, in the form of changing (gender) role expectations (Preisner et al., 2018) or changes in family law with possibly unintended consequences (Kneip et al., 2014).

2.4 Analytical Frame and Hypotheses

According to the above-mentioned mediating mechanisms, being a mother or father may have long-term effects on the incidence of health limitations and, therefore, also life satisfaction in old age that are not foreseeable. Those could be (a) positive according to social control or (b) negative according to parenting stress (which could also offset each other). Moreover, parenthood could moderate the effects of health limitations on life satisfaction for both genders, either through a (c) buffering or (d) disappointment mechanism, and thus weaken or strengthen the effect of age-related health limitations (see Fig. 1).

The present analysis examines these competing mechanisms in order to fill the research gaps surrounding the effects of parenthood on well-being in later life, as well as to propose explanations for previous contradictory findings. The following section describes the methodological procedure to test the competing hypotheses as summarized in Fig. 1.

3 Data & Method

3.1 Data

We used data from the Survey of Health, Ageing and Retirement in Europe (SHARE), a longitudinal, multi-disciplinary and cross-national European study containing information on health, socioeconomic status, and social and family networks of individuals aged 50 or older (Börsch-Supan et al., 2013). The original 2004/2005 SHARE baseline sample included nationally representative samples from 11 European countries (Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Spain, Sweden and Switzerland) plus Israel, drawn from population registries or from multi-stage sampling. The original sample was followed at two-year intervals and complemented with refreshment samples to maintain sample size and representativity and was also extended to newly participating countries (Czech Republic, Poland, Ireland, Hungary, Portugal, Slovenia, Estonia,

Luxembourg, Croatia). By the sixth wave, SHARE included 21 countries and collected more than 100,000 personal interviews. A detailed description of sampling and sample development is available in Bergmann and colleagues (2019).

3.2 Sample Construction

Data from waves 2, 4, 5, and 6 of the SHARE panel were utilized for this analysis. Data from wave 1 was excluded as information on life satisfaction was only collected from wave 2 onward. As our analyses are longitudinal in nature and employ differencing methods, we had to exclude countries that had only participated in one regular panel wave from wave 2 onward (Ireland, Hungary, Croatia). This resulted in a total sample of 222,690 observations from 106,078 respondents. The sample was further restricted to respondents between 50 and 85 years old, resulting in the omission of 13,176 observations from 5,191 respondents (roughly 5% of available cases). Further restricting the sample to only respondents who participated repeatedly, as required for longitudinal analyses, reduced the sample by 27,064 observations (including 7,881 interviewed in wave 6 for the first time), corresponding to a loss of about 13% of observations and 27% of respondents. Finally, complete data for all variables used in the estimation models were only available for 88% of cases, resulting in the exclusion of 22,458 observations from 13,959 respondents. The final sample consists of 159,992 observations from 59,864 respondents (33,510 women and 26,354 men) with at least two interviews with complete information.

3.3 Central Variables

The central variable of interest is subjective well-being; more specifically, overall *satisfaction with life*. Life satisfaction represents a cognitive assessment of the present situation (Diener, 1984). It is typically assessed via short questionnaires, such as the Satisfaction with Life Scale (SWLS), or with so-called "single items measures", yielding very similar results (Cheung & Lucas, 2014). The single-item measure employed in SHARE is utilized here: "On a scale from 0 to 10, where 0 means completely dissatisfied and 10 means completely satisfied, how satisfied are you with your life?".

For the purpose of this analyses, *parental status* is defined as a time-constant variable based on the mention of at least one (living) child at the time of the first observation. Compliant with parenthood as a social rather than biological construct, biological, foster, adopted, and stepchildren are included in this definition.

In addition to parental status, *age* represents the other central explanatory variable. For growth curve analyses, a piecewise linear spline specification (from 50 to 85 in 5-year brackets) is implemented to avoid strong impositions concerning the functional form of the age profile. At the same time, this specification maintains reasonable efficiency and allows for a straightforward contrast of parents and childless individuals.

To trace potential differences in well-being trajectories between parents and childless individuals back to potentially different incidence rates of and vulnerability to health issues and related limitations, a set of respective indicators were included. The variables included in SHARE contain information on diagnosed conditions and limitations in (instrumental) activities of daily living as well as self-reported measures on health status and perceived severity of limitations. As these are all highly correlated and in order to facilitate the interpretation of results, this information was used to construct the variables for analysis by means of factor analysis. Resulting scores largely mirrored the original dimensions for

the objective measures; the subjective dimension (self-rated health and severity of limitations) was reflected in a separate factor (see Table 5 in the appendix). In sum, the following measures were generated: *limitations in (instrumental) activities of daily living* ((I)ADL), *chronic illness*, and *subjective impairment*.

3.4 Analytic Strategy

The present research questions are addressed within the framework of a growth curve analysis. Growth curves are (multilevel) regression models that include a function of "process time" (typically age) that models how the (average) outcome of interest evolves over the life course. Growth curve analyses can thus be seen as a holistic approach, as they examine (partial) life course trajectories as a whole. The advantage of these models is that complete (or partial) life courses can be analyzed within a multivariate regression framework that allows for comparing differences in trajectories over groups and testing for statistical difference.

Several biases might distort the estimation of growth curves, including specification bias, omitted variable bias, selection bias, and over-control bias (Brüderl et al., 2019; Kratz & Brüderl, 2021). *Specification bias* results from imposing a functional form (e.g., quadratic) on an age trend that does not reflect the true process. *Omitted variable bias* occurs when variables affecting both age and the outcome of interest are not controlled for. This pertains to all characteristics that are non-randomly distributed over age and potentially affect well-being, such as gender, social origin, or region. Additionally, cohort and period effects must also be accounted for. *Selection bias* results from respondents' "survival" over time being related to the outcome of interest (here: life satisfaction). If individuals with higher life satisfaction live longer (E. Diener & Chan, 2011) or drop out of the panel less often, they will be over-represented in the sample at older ages (Frijters & Beatton, 2012). Notably, if this affects parents and childless differently, differences in growth curves will also be biased (see Kratz & Patzina, 2020). Finally, *over-control* bias occurs when controlling for post-treatment (mediating) variables, thus absorbing part of the explanatory mechanisms that generate the age effect. For instance, if health is included, it will largely absorb the contribution of biological aging. In this sense, over-control bias is an issue when the aim is to identify the total effect. If this has been accomplished, mediating mechanisms can be investigated in a second step.

To assess the age trajectories for parents and childless individuals accommodating for the aforementioned issues, linear spline fixed effects models are estimated. We assume that life satisfaction can be treated as cardinal, despite being measured on an ordinal scale (Ferrer-i-Carbonell and Frijters 2004). Age trends are modeled (relatively) flexibly via spline specification, thus avoiding specification bias. Employing fixed effects regression effectively controls for all unobserved time-constant confounding variables (including, for example, cohort) and removes selection bias related to life satisfaction levels (Kratz & Brüderl, 2021).

The resulting regression specification is given by:

$$y_{\mathrm{it}} = \alpha_i^1 + \beta^1 X_{\mathrm{it}} + \gamma^1 d_i X_{it} + \zeta^1 C_i X_{it} + \mu^1 p_t + \varepsilon_{it}^1, \quad (1)$$

where y is the time-varying measure of well-being (i.e., life satisfaction), α is a person-specific intercept, X is a set of age splines, and d indicates parental status. C is a set of (time-constant) variables that may be correlated with parental status. While controlling for variables in C is neither necessary nor possible as they are absorbed by α, it is important to

control for potentially different time trends induced by *C*. If we assume that time trends differ between parents and childless individuals, they could, for similar reasons, also differ by marital status (as the mechanisms of social control and buffering outlined above also apply to spouses). Since marital status is correlated with parental status (and, thus, *CX* with *dX*), β and γ will suffer from omitted variable bias when this is not accounted for. We include marital status, education and country of residence upon entering the panel in *C*. We do not include other time-varying variables to avoid over-control bias. Finally, *p* is an indicator that captures potential period effects on life satisfaction induced by the financial crisis that took place during the observation window. Completely controlling for period and cohort effects when estimating age effects is not possible due to their perfect linear dependence. Effectively, this specification assumes the absence of period effects (over and above *p*). If this assumption is violated, estimated age profiles will be confounded by the period effect.

Model 1 describes how life satisfaction develops over the course of later adult life and how these trajectories differ between parents and childless individuals. The growth curve for childless individuals is determined by β^1, the growth curve for parents by $\beta^1+\gamma^1$. Importantly, they refer to the (counterfactual, model-based) age profiles, adjusted for initial differences in *C*. The parameter γ^1 then informs about differences in trajectories between parents and childless individuals, i.e. the effect of parenthood as it evolves over age. Note that by employing fixed effects, group-specific intercepts cannot be estimated.

In a second step, time-varying measures of health and related limitations (*H*) are included into the model to account for a potential mediating mechanism that may differentially contribute to how well-being develops over time for parents and childless individuals. This leads to the following model specification:

$$y_{\mathrm{it}} = \alpha_i^2 + \beta^2 X_{\mathrm{it}} + \gamma^2 d_i X_{it} + \zeta^2 C_i X_{it} + \eta^2 H_{it} + \mu^2 p_t + \varepsilon_{it}^2, \tag{2}$$

A comparison of γ^1 and γ^2 allows for the assessment of whether parents' life satisfaction has developed more or less favorably than it would have without children due to maintained health; in other words, whether support for the *social control* or *stress* hypotheses is found. Note that, in order for this interpretation of β^2 and γ^2 to be valid, we have to further assume that there are no unmeasured confounders of the *H*-*y* relationship. Violations of this assumption will result in collider stratification bias (VanderWeele, 2015).

Finally, we relax the assumption imposed by specification (2) that the life satisfaction of parents and childless individuals responds to occurring health limitations in the same way by additionally including interactions of health and parental status:

$$\mathrm{y}_{\mathrm{it}} = \alpha_i^3 + \beta^3 X_{\mathrm{it}} + \gamma^3 d_i X_{it} + \zeta^3 C_i X_{it} + \eta^3 H_{it} + \vartheta^3 d_i H_{it} + \mu^3 p_t + \varepsilon_{it}^3, \tag{3}$$

ϑ^3 represents whether health deterioration affects parents' life satisfaction differently than that of childless individuals, or whether support for the *buffering* or *disappointment* hypothesis is present. γ^3 reflects how parents' life satisfaction would have developed relative to childless individuals if they neither differed in their health profiles nor their response to present health limitations.

The following section reports slope coefficients of the age splines and their differences by parental status, along with the respective significance tests. In addition, a (graphical) presentation of *differences* in age trends of life satisfaction (relative to age 50) by parental status, computed from models 1–3, is shown and tested against the null as well as against each other. Following the theoretical expectations, all analyses were conducted separately for men and women in order to accommodate for and analyze gender-specific differences in influencing factors as well as mechanisms.

4 Results

The following is a description of the analytical sample. The group of parents (91%) is substantially larger than the group of childless individuals (9%) for both women and men, also given its cohort structure. Still, for the final analyses we are left with 7,394 observations for childless women and 6,868 observations for childless men. Overall, parents report 0.23 points higher life satisfaction, face slightly fewer limitations (both ADL and IADL), but are somewhat more likely to be chronically ill. Thus, there are no clear health (dis-)advantages of parenthood. Self-reported health also does not differ between the two groups. It is clear that parents are much more likely to be (or to have been) married. As being in a partnership may also influence the well-being trajectory, this control variable is included as an interaction effect with the age trends in the growth curve analysis. Table 1 shows the distribution of educational level and countries included.

No evidence of a "parental happiness gap" is found in the SHARE data on a descriptive level. When the sample is split by age and gender, however, a parental well-being *premium* for men in all age groups, except for the oldest, and for women in four of seven age groups is found (Fig. 2 and Table 2). Adjusting for cohort, country, marital status, education, and period, the advantages of parents over the childless are reduced, but remain statistically significant in some age categories. It is likely that parents and childless individuals differ in other (unobserved) characteristics that could account for the correlation between parenthood and well-being. In the fixed effects growth curve models that follow, such time-constant unobserved heterogeneity is eliminated by design. These results therefore focus on differences in trajectories, rather than differences in well-being levels.

Figure 3 (left) shows how well-being develops for women (top) and men (bottom) as a function of age and parenthood (model 1). The graph shows the relative trajectories of the groups to each other, without initial level differences, as these are absorbed by the individual fixed effect in the model. However, the goal here is to explain differences in trajectories, irrespective of differences that already existed at age 50. Moreover, as trajectories should differ only due to parenthood, Fig. 3 shows group-specific growth curves that would have occurred if marital status, education, and country of residence were evenly distributed over parental status.

Figure 3 (left) shows a reverse U-shaped relationship between age and well-being for parents. In the age range analyzed here, maximum life satisfaction occurs around age 70. Thereafter, well-being gradually declines with age. When comparing childless women with mothers, the increase around 70 is more pronounced for childless women and the subsequent decline is less steep. Overall, well-being in old age develops somewhat more favorably for childless women than for mothers.

However, the differences in the predicted life satisfaction scores are only statistically significant around age 70. In this age range, the slopes of the age splines also differ significantly (for more details, see Table 3), resulting in different age trajectories in some age groups. This is not the case for men, where the age trajectories of fathers and childless individuals are quite similar. Some differences emerge at older ages, but are statistically insignificant. Between age 75 and 85, the well-being of childless men develops somewhat more favorably than that of fathers.

The next step aims to explain the observed differences in age trajectories (Fig. 3, right) and investigate whether differences in health are a cause of the different trajectories of parents and childless individuals, which will test the *stress* and the *social control* hypotheses. Table 4 documents the results of models 2 and 3. Looking at the main effects of health

Table 1 Summary statistics of the analytic sample

	Childless		Parents		Total		*t*-test	
	Mean	SD	Mean	SD	Mean	SD	Δ	s.e
Life satisfaction [0,10]	7.45	(1.87)	7.67	(1.77)	7.66	(1.78)	0.23***	(0.02)
Female	0.52	(0.50)	0.57	(0.50)	0.56	(0.50)	0.05***	(0.00)
Age [50,85]	65.74	(9.05)	66.14	(8.74)	66.15	(8.78)	0.40***	(0.08)
ADL	0.10	(0.30)	0.09	(0.29)	0.09	(0.29)	−0.01***	(0.00)
#ADL	0.21	(0.77)	0.18	(0.69)	0.18	(0.69)	−0.03***	(0.01)
IADL	0.16	(0.37)	0.15	(0.35)	0.15	(0.36)	−0.02***	(0.00)
#IADL	0.36	(1.06)	0.29	(0.92)	0.30	(0.94)	−0.07***	(0.01)
Chronic disease	0.62	(0.49)	0.64	(0.48)	0.63	(0.48)	0.02***	(0.00)
#Chronic disease	1.12	(1.21)	1.17	(1.22)	1.17	(1.22)	0.05***	(0.01)
Limitations	0.45	(0.50)	0.45	(0.50)	0.45	(0.50)	0.00	(0.00)
Severe limitations	0.15	(0.36)	0.14	(0.34)	0.14	(0.34)	−0.02***	(0.00)
Self−rated health [1,5]	3.14	(1.06)	3.13	(1.06)	3.13	(1.06)	−0.01	(0.01)
Married when 1st observed	0.40	(0.49)	0.78	(0.41)	0.75	(0.44)	0.38***	(0.00)
Educational level								
None	0.04	(0.18)	0.03	(0.18)	0.03	(0.18)	0.00	(0.00)
ISCED-97 1	0.17	(0.38)	0.19	(0.39)	0.18	(0.39)	0.01***	(0.00)
ISCED-97 2	0.16	(0.37)	0.18	(0.38)	0.17	(0.38)	0.01***	(0.00)
ISCED-97 3	0.32	(0.47)	0.33	(0.47)	0.33	(0.47)	0.01*	(0.00)
ISCED-97 4	0.05	(0.22)	0.05	(0.21)	0.05	(0.21)	0.00	(0.00)
ISCED-97 5	0.24	(0.42)	0.21	(0.41)	0.21	(0.41)	−0.02***	(0.00)
ISCED-97 6	0.01	(0.11)	0.01	(0.09)	0.01	(0.09)	0.00***	(0.00)
Other	0.01	(0.07)	0.00	(0.06)	0.00	(0.06)	0.00**	(0.00)
Country								
Austria	0.08	(0.28)	0.07	(0.25)	0.07	(0.25)	−0.02***	(0.00)
Germany	0.08	(0.27)	0.07	(0.25)	0.07	(0.25)	−0.02***	(0.00)
Sweden	0.05	(0.21)	0.06	(0.25)	0.06	(0.24)	0.02***	(0.00)
Netherlands	0.04	(0.19)	0.04	(0.19)	0.04	(0.19)	0.00	(0.00)
Spain	0.08	(0.28)	0.08	(0.27)	0.08	(0.27)	−0.01**	(0.00)
Italy	0.08	(0.28)	0.07	(0.26)	0.07	(0.26)	−0.01***	(0.00)
France	0.08	(0.28)	0.08	(0.27)	0.08	(0.27)	−0.01**	(0.00)
Denmark	0.06	(0.23)	0.06	(0.25)	0.06	(0.24)	0.01***	(0.00)
Greece	0.02	(0.16)	0.02	(0.15)	0.02	(0.15)	0.00*	(0.00)
Switzerland	0.09	(0.29)	0.05	(0.22)	0.06	(0.23)	−0.04***	(0.00)
Belgium	0.12	(0.32)	0.09	(0.29)	0.09	(0.29)	−0.03***	(0.00)
Israel	0.01	(0.10)	0.03	(0.17)	0.03	(0.16)	0.02***	(0.00)
Czech Republic	0.04	(0.20)	0.09	(0.29)	0.09	(0.28)	0.05***	(0.00)
Poland	0.01	(0.12)	0.03	(0.16)	0.03	(0.16)	0.01***	(0.00)
Luxemburg	0.02	(0.13)	0.01	(0.11)	0.01	(0.11)	−0.01***	(0.00)
Portugal	0.01	(0.11)	0.02	(0.12)	0.02	(0.12)	0.00***	(0.00)
Slovenia	0.03	(0.17)	0.04	(0.20)	0.04	(0.20)	0.01***	(0.00)
Estonia	0.08	(0.27)	0.09	(0.29)	0.09	(0.29)	0.01***	(0.00)

(I)ADL: limitations in (instrumental) activities of daily living; ISCED: International Standard Classification of Education

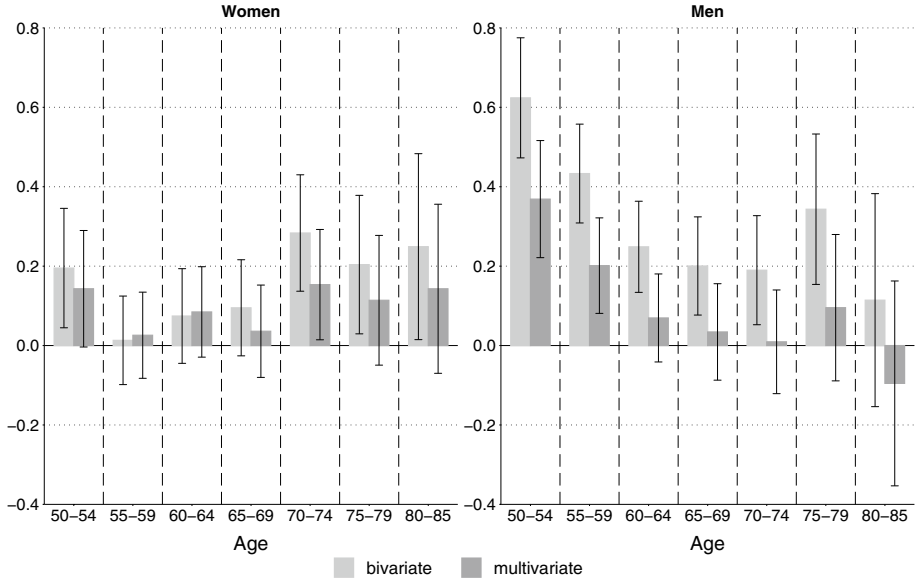

Fig. 2 Differences in subjective well-being between parents and childless individuals by gender and age category

limitations, we find, as expected, negative effects on well-being. Model (2) assumes (due to the restriction of the functional form) that health constraints affect the well-being of parents and the childless equally.

To test whether the difference in age trajectories between parents and childless individuals can be explained by the health variables, the corresponding coefficients from models 1 and 2 are compared and reported as differences in Table 5, column 2 ("Δ"). Neither systematic nor statistically significant differences are found for women. For men, differences are consistently negative, meaning that fathers fare somewhat better than they would if they did not differ from childless men with regard to health-related limitations. The joint effect is also significant. However, only one spline-parenthood-interaction (61/65) shows a statistically significant reduction when controlling for health limitations.

Figure 4 illustrates how the differences in age trajectories change when controlling for health. The baseline specification (top) corresponds to model 1, as shown in Fig. 3. In the lower part, it serves as reference to assess whether incidence of and reaction to health limitations account for statistically significant differences in trajectories between parents and childless individuals. While life satisfaction in oldest age develops more favorably for childless men than for fathers, fathers still benefit from children through better overall health. Without this health advantage, the age trajectories would thus differ even more (Fig. 4, bottom). For women, health does not seem to play a role, as it is not very systematically related to parental status in the first place (see Fig. 5 in appendix).

Model 3 tests the *disappointment* and *buffering* hypotheses, examining whether health restrictions have a stronger or weaker impact on the well-being of parents than on their childless counterparts. Significant differences are found only for IADL: If instrumental limitations are present, they have a stronger negative effect on mothers than on childless women (Table 4, column 3), a possible confirmation of the *disappointment* hypothesis. For men, parenthood seems to weaken the effect of IADL, which can be seen as supporting

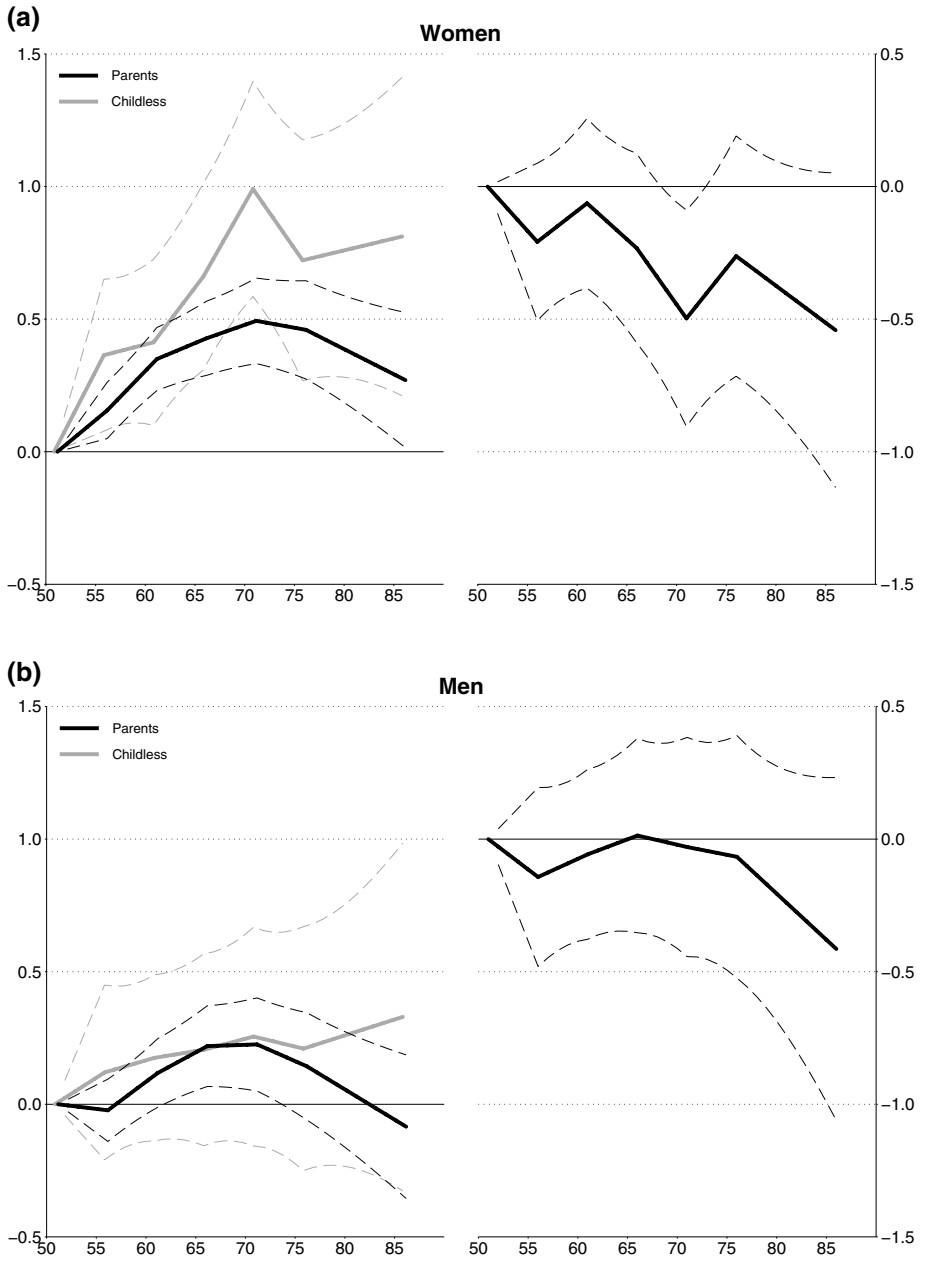

Fig. 3 Age-trajectories in subjective well-being (left) and differences in trajectories by parental status (right)

evidence for the *buffering* hypothesis (Table 4, column 7). However, significance is not maintained when adjusted for multiple testing, neither for women not men. Particularly for men, though, allowing for differential response to health decline changes the differences

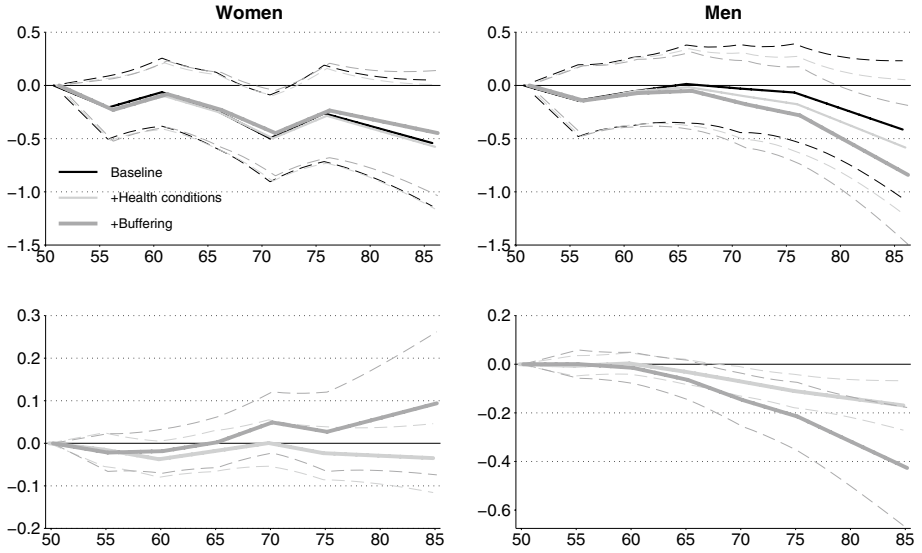

Fig. 4 Differences in well-being trajectories; counterfactual model predictions Top: Test against life satisfaction at age 50 Bottom: Test against baseline specification

in age profiles between fathers and childless individuals (Fig. 4, Table 4, last column). Fathers' well-being would develop even more unfavorably compared to childless men if children did not have a buffering effect. The differences in the age trajectories of mothers and childless women are hardly changed by heterogeneous health effects.

4.1 Robustness Check: Attrition

As noted earlier, fixed effects models rely on weaker assumptions than approaches using between-person variation, also with regard to selective dropout. If low levels of life satisfaction are related to mortality or to panel dropout, fixed effects estimations will remain unbiased. If, however, attrition is related to well-being trajectories, results from fixed effects models will also be biased. To check for a possible influence of selective attrition, two tests were performed: one related to initial dropout (i.e., being observed only once and thus not entering the longitudinal analysis) and one related to subsequent panel retention. First, analyses were replicated applying inverse probability weights, effectively putting more weight on panel respondents who were more similar to the initial dropouts on observable characteristics. As shown in the Appendix (Tables 6 and 7), this hardly affected our findings.

Second, a formal test for possible attrition bias was implemented, based on the idea that a significant effect for a variable indicating dropout in the next wave points to a selective sample with respect to life satisfaction (Wooldridge, 2010, p. 581). Selective dropout was found to be a concern for this analysis, likely related to chronic conditions (see Fig. 5). However, there was little indication that this selection operates differently for parents and childless individuals (c.f. Kratz & Patzina, 2020). Although not statistically significant ($p = 0.07$), selective dropout may be more likely for childless men then for fathers. In this

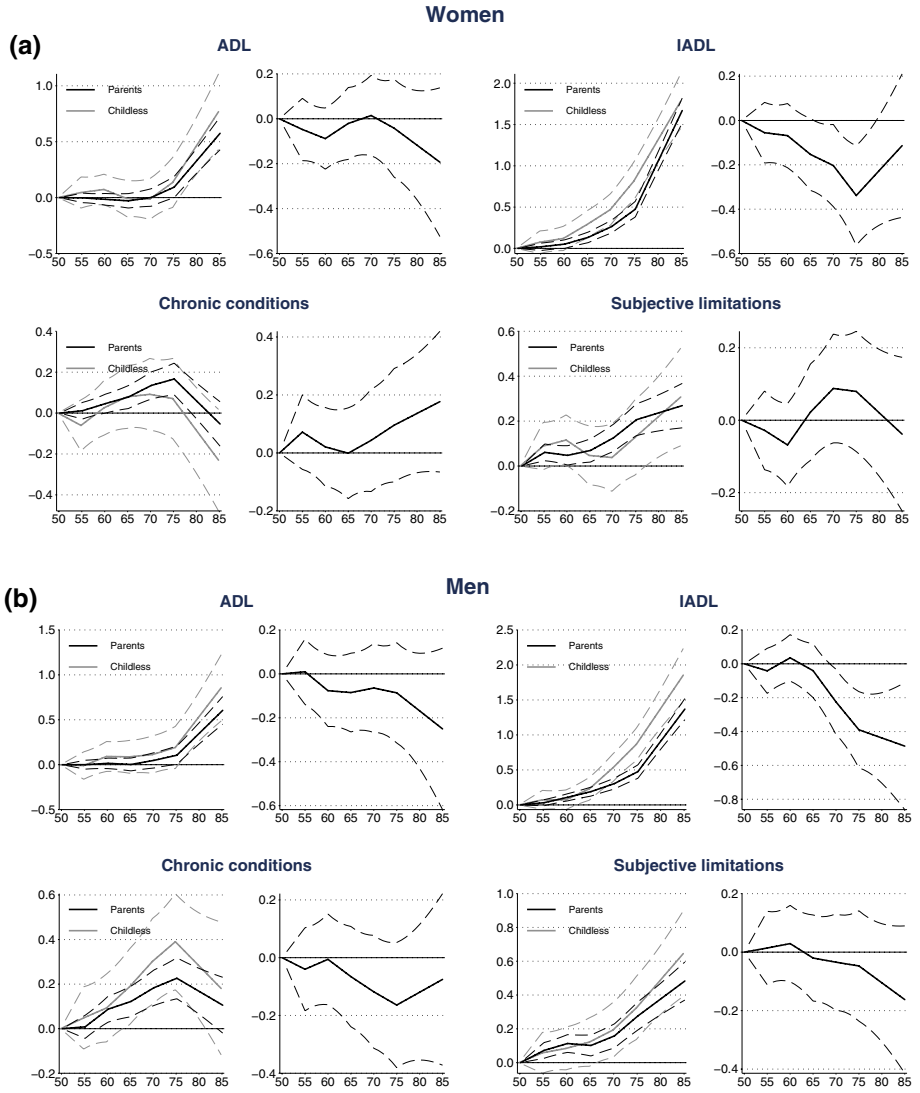

Fig. 5 Health trajectories and differences by parental status; counterfactual model predictions

case, well-being *trajectories* are expected to be distorted, most likely upwards, but their *differences* to be hardly affected as the biases would cancel each other out.

4.2 Robustness Check: The APC Problem

Identifying age effects involves tackling the issue of the perfect collinearity of age (A), period (P), and cohort (C): A = P–C. No technical solution to this problem exists, and identification will necessarily rest on (strong) assumptions that must be made explicit (see e.g. Bell, 2020). As this analysis already controls for cohort by employing fixed

effects regression, completely controlling for period is not possible. Completely omitting period would yield compound effects of age and period unless the true period effect is zero. While the absence of systematic period trends in the relatively short observation window covered (over and above a possible shock due to the financial crisis, which is accounted for) may not be completely implausible, it remains an assumption. However, similar to the issue of attrition discussed above, *differences* in age effects will be identified under the weaker assumption that possible period effects do not systematically differ for older parents and childless individuals. To evaluate the robustness of these findings, the model specification used was compared to one without the financial crisis indicator. This resulted in the growth curves being shifted slightly upwards (slope coefficients increased by roughly 0.003), while differences between parents and childless individuals remained virtually identical.

4.3 Robustness Check: Treatment-induced Confounding

As mentioned above, our approach relies on the assumption of no omitted confounders of health and well-being. While this assumption is rarely challenged, it could be violated if, for example, becoming a grandparent or losing the spouse (due to widowhood or divorce) or a child affects *both*, health *and* life satisfaction (other than through health). The seemingly straightforward approach would be to control for such variables, if observed. However, since such events are themselves a function of parental status, this would induce over-control bias. This is the case of treatment-induced confounding (VanderWeele, 2015). To address this issue, we replicated our mediation analysis in a linear SEM framework and reassessed indirect effects via health (De Stavola et al., 2015; Pearl, 2014). We included grandchildren, loss of a child, divorce, and widowhood as potential confounders. Obtained estimates were almost identical. While we cannot rule out the existence of other unobserved confounders, this increases confidence in the robustness of our results against potential bias due to treatment-induced confounding.

5 Discussion

This article investigated potential differences between parents and childless women and men in the development of life satisfaction over the course of aging. Theoretically, while having children should not affect life-time well-being of well-informed rational actors, it may affect well-being in later life through affecting health decline and the coping therewith in a way not fully anticipated. These mechanisms could operate in either direction and potentially differ for men and women. Children can be considered both sources of social control (promoting healthy behavior) and stress, and they may exceed or disappoint their parents' expectations. Likewise, those choosing to remain childless may neglect or underestimate the lack of support in old age and they may or may not be able to successfully compensate for this deficit through investments in other social relations. The total effect of children on mothers' and fathers' well-being trajectories is thus hardly predictable–as is also reflected in the mixed findings produced by previous research (Hansen, 2012). Our results now show that parenthood tends to have a negative effect on the development of life satisfaction at older ages, albeit not at statistically significant level. Without considering health indicators, the life satisfaction of childless women increased somewhat more between the ages of 50–70 and then declined more gradually compared to the life

satisfaction of mothers. For men, the same models revealed little difference between fathers and childless individuals, but fathers' well-being developed somewhat more negatively after age 75.

As found in other studies (e.g., Gwozdz & Sousa-Poza, 2010), age-related health limitations reduce life satisfaction. We could now show that this contributes to explaining the differences between parents and childless individuals, especially with regard to limitations on IADL. IADL acts as an anticipatory indicator, signaling that more severe health limitations may arise in the future. For women, on average, the onset of such limitations were not shown to be buffered by children. At specific ages, IADL deteriorated mothers' life satisfaction more than that of childless women. This finding could be interpreted as a confirmation of the *disappointment* hypothesis. Controlling for health, it appears that mothers' life satisfaction would have developed slightly more positively in old age if they had not had children. For men, the findings were the opposite: Fathers appear to benefit from having children in the long term via maintained health and better coping with limitations once they occurred–to roughly the extent that their otherwise less favorable developmental trajectories converge to those of childless men.

It is important to stress that the differences in life satisfaction trajectories across age were quite small for individuals with and without children. Thus, our results are quite consistent with the notion of rational actors that can foresee possible long-term consequences of parenthood: Those who believe they will benefit from their adult children are more likely to self-select into parenthood, while those who expect to maintain a higher level of life satisfaction in the long term without children decide to not have children. The latter invest in alternatives such as more robust friendship networks and/or apartments in retirement homes to prevent loneliness in old age and maintain well-being as childless individuals (Kohli et al., 2009).

These results suggest that for fathers, other mechanisms are at play that lead to a less favourable development of life satisfaction if not offset by the mechanisms of social control and buffering. What exactly drives this finding remains to be explained. Children's behavior may affect parental well-being in many ways (Greenfield & Marks, 2006), including their own marriage, transition to parenthood, unemployment episodes, separations from a partner, illness or even death prior to their parent(s). The goal of this analysis was not to examine all potential pathways, but to focus on the child–health–well-being nexus. However, the present findings could also reflect a selection into fatherhood such that those expecting to profit most from having children become fathers.

As with any empirical analysis, the present research is not without limitations. First, the focus is on life satisfaction, which reflects only one aspect of human well-being (Busseri & Sadava, 2011; C. Diener & Esch, 2012; Diener 2009). However, it can be argued that life satisfaction is particularly well suited to test the hypotheses proposed here. The question of whether children positively influence other dimensions of well-being in old age is also of interest, but beyond the present scope. Eudaemonic measures of satisfaction (e.g. Ryff & Singer, 2008) could be used to further investigate whether children contributed to a sense of fulfillment in retrospect, for example as they provide parents with the assurance that some part of them will remain after their death (e.g., genes and memories).

Second, while we provide theoretical reasoning and refer to previous findings, we did not test the hypothesized mechanisms explicitly. Future research should examine the mechanisms of social control, disappointment and support in more detail. This would involve analyzing whether children in fact influence stress and specific health behaviors, and whether they support their parents in case of health-related limitations or whether–and

which–parents are left on their own in times of need. This is not a trivial exercise, as help and support are endogenous: Whether and to which extent children provide help to their older parents depends on the level of need, which likely also affects life satisfaction. A related point would be to investigate potential effect heterogeneity. While this analysis found no evidence for the stress hypothesis on average, it may still be a relevant mechanism for working mothers in specific welfare regimes.

Third, estimating group-specific age trajectories is ambitious, particularly if groups are endogenously determined, as is the case with parental status. More specifically, it must be assumed that there are no omitted age trends generated by variables correlated with parental status. We allow for heterogeneous age trends over countries, marital status, and education, but there may be more. In addition, the validity of the growth curve estimates relies on the absence of a period trend over and above a potential shock generated by the financial crisis as well as attrition bias, both of which cannot be taken for granted: A positive period trend would distort growth curves upwards, as would likely attrition bias. Still, these biases will only carry over to growth curve differences (i.e., the effect of parenthood) if they affect parents and childless individuals differently.

Fourth, contextual influences on the meso and macro level present a promising research direction (Nomaguchi & Milkie, 2020), also in terms of possible differences between motherhood and fatherhood in different contexts as introduced above, but were beyond the scope of our analyses. Note that it is not sufficient to consider contemporary welfare-state features (e.g. defamilialization, care facilities) but rather *changes* in these features that hit individuals *unexpectedly*.

Notwithstanding the above limitations, this investigation has shown that parenthood does not seem to play a major role in the overall development of well-being in older age. Rather, these results support the notion of reasonably rational, well-informed, actors who invest in children when expecting (long-term) well-being returns and otherwise decide against having children and who are adaptive to unforeseen shocks.

Appendix

See Tables 2, 3, 4, 5, 6, 7 and Fig. 5.

Table 2 Life satisfaction by parental status and age group

	Women		Men	
	Without controls	With controls	Without controls	With controls
Parent	0.195*	0.143	0.624***	0.369***
	(0.077)	*(0.075)*	*(0.077)*	*(0.075)*
Age 55–59	0.146	0.167*	0.154	0.137
	(0.083)	*(0.080)*	*(0.083)*	*(0.079)*
Age 60–64	0.161	0.219*	0.427***	0.347***
	(0.093)	*(0.091)*	*(0.091)*	*(0.087)*
Age 65–69	0.129	0.301**	0.538***	0.406***
	(0.095)	*(0.096)*	*(0.095)*	*(0.096)*
Age 70–74	−0.140	0.240	0.510***	0.421***
	(0.103)	*(0.108)*	*(0.099)*	*(0.104)*
Age 75–79	−0.234*	0.280*	0.233*	0.257*
	(0.113)	*(0.119)*	*(0.119)*	*(0.127)*
Age 80–85	−0.241	0.373**	0.422**	0.461*
	(0.136)	*(0.141)*	*(0.150)*	*(0.161)*
Parent×Age 55–59	−0.182*	−0.117	−0.191*	−0.168*
	(0.086)	*(0.082)*	*(0.087)*	*(0.082)*
Parent×Age 60–64	−0.121	−0.058	−0.375***	−0.299***
	(0.097)	*(0.091)*	*(0.095)*	*(0.088)*
Parent×Age 65–69	−0.100	−0.107	−0.423***	−0.335***
	(0.097)	*(0.093)*	*(0.100)*	*(0.100)*
Parent×Age 70–74	0.088	0.010	−0.434***	−0.359***
	(0.107)	*(0.101)*	*(0.104)*	*(0.097)*
Parent×Age 75–79	0.009	−0.029	−0.281*	−0.273*
	(0.118)	*(0.110)*	*(0.124)*	*(0.117)*
Parent×Age 80–85	0.054	0.000	−0.510**	−0.464 **
	(0.142)	*(0.130)*	*(0.157)*	*(0.149)*
Cohort*(df = 6)*		1.810		0.279
Country*(df = 17)*		290.812***		212.692***
Marital status*(df = 5)*		192.813***		109.898***
Education*(df = 7)*		71.660***		54.527***
Post crisis*(df = 1)*		21.383***		13.468***
Intercept	7.450 ***	7.370***	7.115***	7.422***
	* *(0.074)*	*(0.108)*	*(0.073)*	*(0.115)*
R^2	0.003	0.130	0.006	0.127
Number of persons	32,346	32,388	25,580	25,580
Number of person–years	87,339	87,339	68,090	68,090

F-statistics reported for controls; df: (numerator) degrees of freedom

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; clustered standard errors in parentheses

Table 3 Age trends in life satisfaction by parental status, FE regression using age splines

	Women		Men	
	AME	Δ	AME	Δ
Childless: 50/55	0.073 *	−0.042	0.024	−0.029
	(0.029)	*(0.030)*	*(0.034)*	*(0.034)*
Parents: 50/55	0.031**		−0.005	
	(0.011)		*(0.012)*	
Childless: 56/60	0.010	0.029	0.011	0.017
	(0.022)	*(0.022)*	*(0.022)*	*(0.023)*
Parents: 56/60	0.039 ***		0.028 ***	
	(0.008)		*(0.008)*	
Childless: 61/65	0.050*	−0.034	0.006	0.014
	(0.021)	*(0.022)*	*(0.021)*	*(0.022)*
Parents: 61/65	0.016*		0.020**	
	(0.007)		*(0.008)*	
Childless: 66/70	0.066**	−0.053*	0.010	−0.009
	(0.025)	*(0.026)*	*(0.025)*	*(0.026)*
Parents: 66/70	0.013		0.001	
	(0.007)		*(0.008)*	
Childless: 71/75	−0.054*	0.047	−0.009	−0.007
	(0.027)	*(0.027)*	*(0.028)*	*(0.029)*
Parents: 71/75	−0.007		−0.016	
	(0.008)		*(0.009)*	
Childless: 76/85	0.009	−0.028	0.012	−0.035
	(0.021)	*(0.022)*	*(0.025)*	*(0.026)*
Parents: 76/85	−0.019*		−0.023**	
	(0.008)		*(0.008)*	
Post crisis	*0.035*		*0.043*	
	(0.027)		*(0.028)*	
Marital status × age*(df = 6)*	6.562***		2.610*	
Education × age*(df = 42)*	1.303		1.000	
Country × age*(df = 102)*	1.569***		1.897***	
All*(df = 150)*	1.808***		1.615***	
Overall test (χ^2**(6)**)		13.408*		3.97
R^2	0.008		0.008	
Number of persons	33,510		26,354	
Number of person- years	90,081		69,911	

F-statistics reported for control trends; df: (numerator) degrees of freedom

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; clustered standard errors in parentheses; columns Δ report the differences in average marginal effects (AME) for parents and childless

Table 4 Health limitations and life satisfaction by parental status over age

	Women				Men			
	Coef	Δ	Coef	Δ	Coef	Δ	Coef	Δ
ADL	−0.128***		−0.106**		−0.129***		−0.185***	
	(0.010)		*(0.036)*		*(0.012)*		*(0.043)*	
IADL	−0.142***		−0.063		−0.180***		−0.268***	
	(0.010)		*(0.038)*		*(0.013)*		*(0.044)*	
Chronic illness	−0.093***		−0.063		−0.099***		−0.116**	
	(0.011)		*(0.037)*		*(0.012)*		*(0.039)*	
Subjective impairment	−0.269***		−0.244***		−0.260***		−0.262***	
	(0.012)		*(0.042)*		*(0.013)*		*(0.048)*	
Parent × ADL			−0.019				0.073	
			(0.038)				*(0.045)*	
Parent×IADL			−0.081*				0.100*	
			(0.039)				*(0.047)*	
Parent × chronic			−0.029				0.023	
			(0.039)				*(0.042)*	
Parent × subjective impairment			−0.032				0.009	
			(0.044)				*(0.051)*	
Age 50–55	0.080**		0.081**		0.030		0.030	
	(0.029)		*(0.029)*		*(0.033)*		*(0.033)*	
Age 56–60	0.015		0.010		0.016		0.020	
	(0.022)		*(0.021)*		*(0.022)*		*(0.022)*	
Age 61–65	0.050*		0.049*		0.016		0.019	
	(0.021)		*(0.021)*		*(0.021)*		*(0.021)*	
Age 66–70	0.071**		0.065**		0.027		0.034	
	(0.025)		*(0.024)*		*(0.025)*		*(0.024)*	

Table 4 (continued)

	Women				Men			
	Coef	Δ	Coef	Δ	Coef	Δ	Coef	Δ
Age 71–75	−0.036		−0.036		0.014		0.019	
	(0.026)		*(0.026)*		*(0.027)*		*(0.027)*	
Age 76–85	0.033		0.025		0.045		0.058*	
	(0.021)		*(0.021)*		*(0.025)*		*(0.025)*	
Parent × 50–55	−0.045	−0.003	−0.046	−0.004	−0.030	−0.001	−0.028	0.000
	(0.030)	*(0.004)*	*(0.030)*	*(0.005)*	*(0.034)*	*(0.004)*	*(0.034)*	*(0.006)*
Parent × 56–60	0.025	−0.005	0.030	0.001	0.019	0.002	0.014	−0.003
	(0.022)	*(0.003)*	*(0.022)*	*(0.004)*	*(0.023)*	*(0.003)*	*(0.023)*	*(0.004)*
Parent × 61–65	−0.030	0.004	−0.030	0.004	0.007	−0.007*	0.004	−0.010*
	(0.022)	*(0.003)*	*(0.022)*	*(0.003)*	*(0.022)*	*(0.003)*	*(0.022)*	*(0.005)*
Parent × 66–70	−0.049	0.004	−0.044	0.009*	−0.017	−0.008*	−0.025	−0.017**
	(0.025)	*(0.003)*	*(0.025)*	*(0.004)*	*(0.026)*	*(0.004)*	*(0.025)*	*(0.006)*
Parent × 71–75	0.042	−0.005	0.043	−0.004	−0.015	−0.008	−0.021	−0.014
	(0.027)	*(0.004)*	*(0.027)*	*(0.005)*	*(0.028)*	*(0.004)*	*(0.028)*	*(0.007)*
Parent × 76–85	−0.029	−0.001	−0.021	0.007	−0.041	−0.006	−0.056*	−0.021**
	(0.021)	*(0.003)*	*(0.022)*	*(0.006)*	*(0.025)*	*(0.004)*	*(0.026)*	*(0.008)*
Post crisis	0.052		0.051		0.060		0.058	
	(0.027)		*(0.027)*		*(0.028)*		*(0.028)*	
Marital status × age*(df=6)*	7.015***		8.213***		2.929**		2.868**	
Education × age*(df=42)*	1.408*		1.372		1.024		1.113	
Country × age*(df=102)*	1.565***		1.583***		1.819***		1.734***	
Marital status × health*(df=4)*			2.695*				0.609	
Education × health*(df=28)*			1.078				1.590*	
Country × health*(df=68)*			2.544***				1.493**	

Table 4 (continued)

	Women				Men			
	Coef	Δ	Coef	Δ	Coef	Δ	Coef	Δ
Overall test (χ^2**(6)**)		8.297		11.602		19.583**		16.223*
R^2	0.025		0.030		0.028		0.033	
Number of persons	33,510		33,510		26,354		26,354	
Number of person – years	90,081		90,081		69,911		69,911	

F-statistics reported for control trends; (I)ADL: limitations in (instrumental) activities of daily living; df: (numerator) degrees of freedom

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; clustered standard errors in parentheses; columns Δ report changes in coefficients compared with the specification in Table 4

Table 5 Rotated factor loadings

Variable	ADL	Chronic illness	IADL	Subjective impairment	Uniqueness
Some limitations	0.162	0.237	0.194	*0.578*	0.546
Severe limitations	0.275	0.124	0.281	*0.471*	0.608
# ADLs	*0.833*	0.072	0.309	0.080	0.199
At least 1 ADL	*0.799*	0.095	0.226	0.150	0.279
# IADLs	0.438	0.092	*0.748*	0.100	0.230
At least 1 IADL	0.287	0.123	*0.733*	0.187	0.330
Self-perceived health	0.187	0.336	0.206	*0.535*	0.524
# chronic diseases	0.121	*0.783*	0.129	0.164	0.329
$\geq$1 chronic disease	0.046	*0.783*	0.054	0.087	0.375

(I)ADL: limitations in (instrumental) activities of daily living

Table 6 Age trends in life satisfaction by parental status, FE regression using age splines adjusted for initial dropout using inverse probability weights

	Women		Men	
	AME	Δ	AME	Δ
Childless: 50/55	0.084**	−0.048	0.019	−0.016
	(0.031)	*(0.033)*	*(0.034)*	*(0.035)*
Parents: 50/55	0.036**		−0.002	
	(0.011)		*(0.012)*	
Childless: 56/60	0.023	0.018	0.015	0.014
	(0.024)	*(0.023)*	*(0.023)*	*(0.024)*
Parents: 56/60	0.041***		0.031***	
	(0.008)		*(0.008)*	
Childless: 61/65	0.039	−0.022	0.015	0.015
	(0.022)	*(0.023)*	*(0.022)*	*(0.024)*
Parents: 61/65	0.017*		0.022**	
	(0.007)		*(0.008)*	
Childless: 66/70	0.083**	−0.069*	0.009	−0.018
	(0.026)	*(0.027)*	*(0.026)*	*(0.027)*
Parents: 66/70	0.014		0.004	
	(0.008)		*(0.008)*	
Childless: 71/75	−0.056*	0.053	−0.003	−0.003
	(0.026)	*(0.027)*	*(0.029)*	*(0.030)*
Parents: 71/75	−0.003		−0.013	
	(0.008)		*(0.009)*	
Childless: 76/85	0.021	−0.039	0.021	−0.045
	(0.022)	*(0.023)*	*(0.026)*	*(0.027)*
Parents: 76/85	−0.018*		−0.019*	
	(0.008)		*(0.008)*	
Post crisis	*0.050*		*0.069**	
	(0.028)		*(0.030)*	
Marital status × age*(df = 6)*	6.208***		2.562*	
Education × age*(df = 42)*	1.469*		1.099	
Country × age*(df = 102)*	1.617***		2.010***	
All*(df = 150)*	1.878***		1.707***	
Overall test (χ^2(6))		**14.615***		**3.636***
R^2	0.010		0.009	
Number of persons	33,509		26,352	
Number of person- years	90,078		69,904	

F-statistics reported for control trends; df: (numerator) degrees of freedom

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; clustered standard errors in parentheses; columns Δ report the differences in average marginal effects (AME) for parents and childless

Table 7 Health limitations and life satisfaction by parental status over age, adjusted for initial dropout using inverse probability weights

	Women				Men			
	Coef	Δ	Coef	Δ	Coef	Δ	Coef	Δ
ADL	−0.137***		−0.130***		−0.131***		−0.190***	
	(0.011)		*(0.038)*		*(0.013)*		*(0.045)*	
IADL	−0.145***		−0.081*		−0.175***		−0.251***	
	(0.010)		*(0.040)*		*(0.014)*		*(0.045)*	
Chronic illness	−0.097***		−0.067		−0.100***		−0.117**	
	(0.011)		*(0.037)*		*(0.012)*		*(0.041)*	
Subjective impairment	−0.275***		−0.268***		−0.266***		−0.270***	
	(0.013)		*(0.044)*		*(0.014)*		*(0.049)*	
Parent × ADL			0.003				0.078	
			(0.040)				*(0.047)*	
Parent × IADL			−0.063				0.089	
			(0.042)				*(0.048)*	
Parent × chronic			−0.028				0.024	
			(0.039)				*(0.044)*	
Parent × subjective impairment			−0.013				0.011	
			(0.046)				*(0.052)*	
Age 50/55	0.090**		0.091**		0.025		0.022	
	(0.031)		*(0.031)*		*(0.033)*		*(0.033)*	
Age 56/60	0.027		0.022		0.019		0.024	
	(0.022)		*(0.023)*		*(0.022)*		*(0.023)*	
Age 61/65	0.040		0.039		0.024		0.026	
	(0.022)		*(0.022)*		*(0.022)*		*(0.022)*	
Age 66/70	0.086***		0.080**		0.026		0.032	
	(0.026)		*(0.026)*		*(0.025)*		*(0.025)*	

Table 7 (continued)

	Women				Men			
	Coef	Δ	Coef	Δ	Coef	Δ	Coef	Δ
Age 71/75	−0.036		−0.035		0.019		0.024	
	(0.026)		*(0.026)*		*(0.028)*		*(0.028)*	
Age 76/85	0.046*		0.042		0.053*		0.064*	
	(0.022)		*(0.022)*		*(0.026)*		*(0.026)*	
Parent × 50/55	−0.051	−0.003	−0.052	−0.004	-0.023	−0.001	−0.020	0.002
	(0.032)	*(0.005)*	*(0.032)*	*(0.006)*	*(0.034)*	*(0.005)*	*(0.034)*	*(0.006)*
Parent × 56/60	0.014	−0.004	0.019	0.001	0.019	0.002	0.013	−0.003
	(0.023)	*(0.003)*	*(0.023)*	*(0.004)*	*(0.023)*	*(0.004)*	*(0.024)*	*(0.005)*
Parent × 61/65	−0.019	0.003	−0.018	0.005	0.000	−0.007	−0.002	−0.009
	(0.023)	*(0.003)*	*(0.023)*	*(0.004)*	*(0.023)*	*(0.003)*	*(0.023)*	*(0.005)*
Parent × 66/70	−0.063*	0.006	−0.058*	0.011*	−0.013	−0.008	−0.021	−0.016**
	(0.027)	*(0.004)*	*(0.026)*	*(0.005)*	*(0.026)*	*(0.004)*	*(0.026)*	*(0.006)*
Parent × 71/75	0.046	−0.007	0.045	−0.008	−0.018	−0.008	−0.022	−0.013
	(0.027)	*(0.004)*	*(0.027)*	*(0.006)*	*(0.029)*	*(0.005)*	*(0.029)*	*(0.008)*
Parent × 76/85	−0.042	−0.003	−0.038	−0.001	−0.047	−0.007	−0.060*	−0.020*
	(0.022)	*(0.003)*	*(0.023)*	*(0.006)*	*(0.027)*	*(0.004)*	*(0.027)*	*(0.008)*
Post crisis	0.070*		0.065*		0.087**		0.084*	
	(0.028)		*(0.028)*		*(0.030)*		*(0.030)*	
Marital status × age*(df = 6)*	6.549***		7.623***		2.670*		2.493*	
Education × age *(df = 42)*	1.564*		1.532*		1.093		1.187	
Country × age *(df = 102)*	1.639***		1.653***		1.914***		1.829***	
Marital status × health health *(df = 4)*			2.830*				0.543	
Education × health *(df = 28)*			1.158				2.302***	
Country × health *(df = 68)*			2.523***				1.566**	

Table 7 (continued)

	Women				Men			
	Coef	Δ	Coef	Δ	Coef	Δ	Coef	Δ
Overall test (χ^2(6))		**10.318**		**9.296**		**18.935****		**14.651***
R^2	0.028		0.033		0.030		0.035	
Number of persons	33,509		33,509		26,352		26,352	
Number of person-years	90,078		90,078		69,904		69,904	

F-statistics reported for control trends; (I)ADL: limitations in (instrumental) activities of daily living; df: (numerator) degrees of freedom

*$p<0.05$, **$p<0.01$, ***$p<0.001$; clustered standard errors in parentheses; columns Δ report changes in coefficients compared with the specification in Table 6

Acknowledgements This paper uses data from SHARE Waves 1, 2, 3, 4, 5, 6 and 7 (DOIs: https://doi.org/10.6103/SHARE.w1.800, https://doi.org/10.6103/SHARE.w2.800, https://doi.org/10.6103/SHARE.w3.800,https://doi.org/10.6103/SHARE.w4.800,https://doi.org/10.6103/SHARE.w5.800 ,https://doi.org/10.6103/SHARE.w6.800 ,https://doi.org/10.6103/SHARE.w7.800).. The SHARE data collection has been funded by the European Commission, DG RTD through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221, SSHOC: GA N°823782, SHARE-COVID19: GA N°101015924) and by DG Employment, Social Affairs & Inclusion through VS 2015/0195, VS 2016/0135, VS 2018/0285, VS 2019/0332, and VS 2020/0313. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C, RAG052527A) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

Funding Open Access funding enabled and organized by Projekt DEAL. The authors have no relevant financial or non-financial interests to disclose. All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. The authors have no financial or proprietary interests in any material discussed in this article.

Declarations

Conflict of interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

Data availability Data are freely available to registered users through the SHARE Research Data Center, subject to the SHARE conditions of use. See http://www.share-project.org.

Code availability All Stata code used to produce the reported results are available at https://osf.io/p4635/?view_only=8350bca076484636a6672f34cb420d7f

References

Antonucci, T. C., Ajrouch, K. J., & Birditt, K. S. (2014). The convoy model: Explaining social relations from a multidisciplinary perspective. *The Gerontologist, 54*(1), 82–92. https://doi.org/10.1093/geront/gnt118

Bell, A. (2020). Age period cohort analysis: A review of what we should and shouldn't do. *Annals of Human Biology, 47*(2), 208–217. https://doi.org/10.1080/03014460.2019.1707872

Bergmann, M., Kneip, T., De Luca, G., & Scherpenzeel, A. (2019). *Survey participation in the Survey of Health, Ageing and Retirement in Europe (SHARE), wave 1–7. Based on release 7.0.0. SHARE working paper series.* (No. 41–2019). Munich: MEA, Max Planck Institute for Social Law and Social Policy.

Bianchi, S. M. (2000). Maternal employment and time with children: Dramatic change or surprising continuity? *Demography, 37*(4), 401–414. https://doi.org/10.1353/dem.2000.0001

Borg, C., Hallberg, I. R., & Blomqvist, K. (2006). Life satisfaction among older people (65+) with reduced self-care capacity: The relationship to social, health and financial aspects. *Journal of Clinical Nursing, 15*(5), 607–618. https://doi.org/10.1111/j.1365-2702.2006.01375.x

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., et al. (2013). Data resource profile: The survey of health, ageing and retirement in Europe (SHARE). *International Journal of Epidemiology, 42*(4), 992–1001. https://doi.org/10.1093/ije/dyt088

Brüderl, J., Kratz, F., & Bauer, G. (2019). Life course research with panel data: An analysis of the reproduction of social inequality. *Advances in Life Course Research, 41*, 100247. https://doi.org/10.1016/j.alcr.2018.09.003

Buber, I., & Engelhardt, H. (2008). Children's impact on the mental health of their older mothers and fathers: Findings from the survey of health, ageing and retirement in Europe. *European Journal of Ageing, 5*(1), 31–45. https://doi.org/10.1007/s10433-008-0074-8

Bucher-Koenen, T., Farbmacher, H., Guber, R., & Vikstrom, J. (2020). Double trouble: The burden of child-rearing and working on maternal mortality. *Demography, 57*(2), 559–576. https://doi.org/10.1007/s13524-020-00868-6

Busseri, M. A., & Sadava, S. W. (2011). A review of the tripartite structure of subjective well-being: Implications for conceptualization, operationalization, analysis, and synthesis. *Personality and Social Psychology Review, 15*(3), 290–314. https://doi.org/10.1177/1088868310391271

Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging, 7*(3), 331–338. https://doi.org/10.1037/0882-7974.7.3.331

César, F., Costa, P., Oliveira, A., & Fontaine, A. M. (2018). "To suffer in paradise": Feelings mothers share on Portuguese Facebook sites. *Frontiers in Psychology, 9*, 1797. https://doi.org/10.3389/fpsyg.2018.01797

Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life Research, 23*(10), 2809–2818. https://doi.org/10.1007/s11136-014-0726-4

Clark, A. E., & Georgellis, Y. (2013). Back to baseline in Britain: Adaptation in the British household panel survey. *Economica, 80*(319), 496–512. https://doi.org/10.1111/ecca.12007

De Stavola, B. L., Daniel, R. M., Ploubidis, G. B., & Micali, N. (2015). Mediation analysis with intermediate confounding: Structural equation modeling viewed through the causal inference lens. *American Journal of Epidemiology, 181*(1), 64–80. https://doi.org/10.1093/aje/kwu239

Deaton, A., & Stone, A. A. (2014). Evaluative and hedonic wellbeing among those with and without children at home. *Proceedings of the National Academy of Sciences, 111*(4), 1328–1333. https://doi.org/10.1073/pnas.1311600111

Deindl, C., & Brandt, M. (2017). Support networks of childless older people: Informal and formal support in Europe. *Ageing and Society, 37*(8), 1543–1567. https://doi.org/10.1017/S0144686X16000416

Deindl, C., Brandt, M., & Hank, K. (2016). Social networks, social cohesion, and later-life health. *Social Indicators Research, 126*(3), 1175–1187. https://doi.org/10.1007/s11205-015-0926-5

Diener, C., & Esch, T. (2012). The neurobiology of happiness: How positive psychology has changed medicine. *Neuroforum, 18*(2), 229–230.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542–575. https://doi.org/10.1037/0033-2909.95.3.542

Diener, E., & Chan, M. Y. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being, 3*(1), 1–43. https://doi.org/10.1111/j.1758-0854.2010.01045.x

Donath, O. (2015). Regretting motherhood: A sociopolitical analysis. *Signs Journal of Women in Culture and Society, 40*(2), 343–367. https://doi.org/10.1086/678145

Durkheim, E. (1951). *Suicide. A study in sociology*. The Free Press.

Easterlin, R. A. (2005). A puzzle for adaptive theory. *Journal of Economic Behavior & Organization, 56*(4), 513–521. https://doi.org/10.1016/j.jebo.2004.03.003

Diener, E. (Ed.). (2009). *Assessing well-being. The collected works of Ed Diener. Social indicators research series.* Dordrecht Heidelberg London New York: Springer.

Ferrer-i-Carbonell, A., & Frijters, P. (2004). How important is methodology for the estimates of the determinants of happiness? *The Economic Journal, 114*(497), 641–659. https://doi.org/10.1111/j.1468-0297.2004.00235.x

Frederick, S., Loewenstein, G., & O'Donoghue, T. (2002). Time discounting and time preference: A critical review. *Journal of Economic Literature, 40*(2), 351–401. https://doi.org/10.1257/002205102320161311

Frijters, P., & Beatton, T. (2012). The mystery of the U-shaped relationship between happiness and age. *Journal of Economic Behavior & Organization, 82*(2), 525–542. https://doi.org/10.1016/j.jebo.2012.03.008

Fuhrer, R., Shipley, M. J., Chastang, J. F., Schmaus, A., Niedhammer, I., Stansfeld, S. A., et al. (2002). Socioeconomic position, health, and possible explanations: A tale of two cohorts. *American Journal of Public Health, 92*(8), 1290–1294. https://doi.org/10.2105/ajph.92.8.1290

Fuhrer, R., Stansfeld, S. A., Chemali, J., & Shipley, M. J. (1999). Gender, social relations and mental health: Prospective findings from an occupational cohort (Whitehall II study). *Social Science & Medicine, 48*(1), 77–87. https://doi.org/10.1016/S0277-9536(98)00290-1

Greenfield, E. A., & Marks, N. F. (2006). Linked lives: Adult children's problems and their parents' psychological and relational well-being. *Journal of Marriage and Family, 68*(2), 442–454. https://doi.org/10.1111/j.1741-3737.2006.00263.x

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy, 80*(2), 223–255. https://doi.org/10.1086/259880

Gwozdz, W., & Sousa-Poza, A. (2010). Ageing, health and life satisfaction of the oldest old: An analysis for Germany. *Social Indicators Research, 97*(3), 397–417. https://doi.org/10.1007/s11205-009-9508-8

Hank, K., & Wagner, M. (2013). Parenthood, marital status, and well-being in later life: Evidence from SHARE. *Social Indicators Research, 114*(2), 639–653. https://doi.org/10.1007/s11205-012-0166-x

Hansen, T. (2012). Parenthood and happiness: A review of folk theories versus empirical evidence. *Social Indicators Research, 108*(1), 29–64. https://doi.org/10.1007/s11205-011-9865-y

Herlofson, K., & Brandt, M. (2020). Helping older parents in Europe: The importance of grandparenthood, gender and care regime. *European Societies, 22*(3), 390–410. https://doi.org/10.1080/14616696.2019.1694163

Hoffmann, L. W., & Hoffmann, M. L. (1973). The value of children to parents. In J. T. Fawcett (Ed.), *Psychological perspectives on population* (pp. 19–76). Basic Books.

Horner, E. M. (2014). Subjective well-being and retirement: Analysis and policy recommendations. *Journal of Happiness Studies, 15*(1), 125–144. https://doi.org/10.1007/s10902-012-9399-2

Kneip, T., Bauer, G., & Reinhold, S. (2014). Direct and indirect effects of unilateral divorce law on marital stability. *Demography, 51*(6), 2103–2126.

Kohler, H.-P., & Mencarini, L. (2016). The parenthood happiness puzzle: An introduction to special issue. *European Journal of Population, 32*(3), 327–338. https://doi.org/10.1007/s10680-016-9392-2

Kohli, M., Hank, K., & Künemund, H. (2009). The social connectedness of older Europeans: Patterns, dynamics and contexts. *Journal of European Social Policy, 19*(4), 327–340. https://doi.org/10.1177/1350506809341514

Kratz, F., & Brüderl, J. (2021). The age trajectory of happiness. https://doi.org/10.31234/osf.io/d8f2z

Kratz, F., & 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. https://doi.org/10.1093/esr/jcaa003

Kravdal, Ø. (2014). The estimation of fertility effects on happiness: Even more difficult than usually acknowledged. *European Journal of Population, 30*(3), 263–290. https://doi.org/10.1007/s10680-013-9310-9

Lindenberg, S. (1985). An assessment of the new political economy: Its potential for the social sciences and for sociology in particular. *Sociological Theory, 3*(1), 99–114. https://doi.org/10.2307/202177

Lindenberg, S. (1989). Social production functions, deficits, and social revolutions prerevolutionary France and Russia. *Rationality and Society, 1*(1), 51–77. https://doi.org/10.1177/1043463189001001005

Litwin, H., & Stoeckel, K. J. (2014). Confidant network types and well-being among older Europeans. *The Gerontologist, 54*(5), 762–772. https://doi.org/10.1093/geront/gnt056

Loewenstein, G., & Schkade, D. (1999). Wouldn't it be nice? Predicting future feelings. In D. Kahnemann, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 85–105). Russel Sage Foundation.

Martire, L. M., & Stephens, M. A. P. (2003). Juggling parent care and employment responsibilities: The dilemmas of adult daughter caregivers in the workforce. *Sex Roles, 48*(3/4), 167–173. https://doi.org/10.1023/A:1022407523039

McLaughlin, D., Vagenas, D., Pachana, N. A., Begum, N., & Dobson, A. (2010). Gender differences in social network size and satisfaction in adults in their 70s. *Journal of Health Psychology, 15*(5), 671–679. https://doi.org/10.1177/1359105310368177

Mu, Z., & Xie, Y. (2016). 'Motherhood penalty' and 'fatherhood premium'? Fertility effects on parents in China. *Demographic Research, 35*, 1373–1410. https://doi.org/10.4054/DemRes.2016.35.47

Mudrazija, S. (2014). The balance of intergenerational family transfers: A life-cycle perspective. *European Journal of Ageing, 11*(3), 249–259. https://doi.org/10.1007/s10433-013-0302-8

Musick, K., Meier, A., & Flood, S. (2016). How parents fare: Mothers' and fathers' subjective well-being in time with children. *American Sociological Review, 81*(5), 1069–1095. https://doi.org/10.1177/0003122416663917

Myrskylä, M., & Margolis, R. (2014). Happiness: Before and after the kids. *Demography, 51*(5), 1843–1866. https://doi.org/10.1007/s13524-014-0321-x

Nauck, B. (2014). Value of children and the social production of welfare. *Demographic Research, 30*(66), 1793–1824. https://doi.org/10.4054/DemRes.2014.30.66

Nelson-Coffey, S. K., Killingsworth, M., Layous, K., Cole, S. W., & Lyubomirsky, S. (2019). Parenthood is associated with greater well-being for fathers than mothers. *Personality and Social Psychology Bulletin, 45*(9), 1378–1390. https://doi.org/10.1177/0146167219829174

Nomaguchi, K., & Milkie, M. A. (2020). Parenthood and well-being: A decade in review. *Journal of Marriage and Family, 82*(1), 198–223. https://doi.org/10.1111/jomf.12646

Pearl, J. (2014). Interpretation and identification of causal mediation. *Psychological Methods, 19*(4), 459–481. https://doi.org/10.1037/a0036434

Pollmann-Schult, M. (2014). Parenthood and life satisfaction: Why don't children make people happy? *Journal of Marriage and Family, 76*(2), 319–336. https://doi.org/10.1111/jomf.12095

Preisner, K., Neuberger, F., Posselt, L., & Kratz, F. (2018). Motherhood, employment, and life satisfaction: Trends in Germany between 1984 and 2015. *Journal of Marriage and Family, 80*(5), 1107–1124. https://doi.org/10.1111/jomf.12518

Pripp, A. H., Skreden, M., Skari, H., Malt, U., & Emblem, R. (2010). Underlying correlation structures of parental stress, general health and anxiety. *Scandinavian Journal of Psychology, 51*(6), 473–479. https://doi.org/10.1111/j.1467-9450.2010.00841.x

Radó, M. K. (2020). Tracking the effects of parenthood on subjective well-being: Evidence from Hungary. *Journal of Happiness Studies, 21*(6), 2069–2094. https://doi.org/10.1007/s10902-019-00166-y

Ridker, P. M., Hennekens, C. H., Buring, J. E., & Rifai, N. (2000). C-reactive protein and other markers of inflammation in the prediction of cardiovascular disease in women. *New England Journal of Medicine, 342*(12), 836–843. https://doi.org/10.1056/NEJM200003233421202

Rosenthal, C. J. (1985). Kinkeeping in the familial division of labor. *Journal of Marriage and Family, 47*(4), 965–974. https://doi.org/10.2307/352340

Ryff, C. D., & Singer, B. H. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies, 9*(1), 13–39. https://doi.org/10.1007/s10902-006-9019-0

Schmitz, A., & Brandt, M. (2019). Gendered patterns of depression and its determinants in older Europeans. *Archives of Gerontology and Geriatrics, 82*, 207–216. https://doi.org/10.1016/j.archger.2019.02.015

Shye, D., Mullooly, J. P., Freeborn, D. K., & Pope, C. R. (1995). Gender differences in the relationship between social network support and mortality: A longitudinal study of an elderly cohort. *Social Science & Medicine, 41*(7), 935–947. https://doi.org/10.1016/0277-9536(94)00404-H

Smith, A. (1776). The wealth of nations: An inquiry into the nature and causes of the wealth of nations. London: Strahan and Cadell

Stanca, L. (2012). Suffer the little children: Measuring the effects of parenthood on well-being worldwide. *Journal of Economic Behavior & Organization, 81*(3), 742–750. https://doi.org/10.1016/j.jebo.2010.12.019

Umberson, D. (1987). Family status and health behaviors: Social control as a dimension of social integration. *Journal of Health and Social Behavior, 28*(3), 306–319. https://doi.org/10.2307/2136848

Umberson, D., Pudrovska, T., & Reczek, C. (2010). Parenthood, childlessness, and well-being: A life course perspective. *Journal of Marriage and Family, 72*(3), 612–629. https://doi.org/10.1111/j.1741-3737.2010.00721.x

Umberson, D., & Williams, K. (1999). Family status and mental health. In C. S. Aneshensel & J. C. Phelan (Eds.), *Handbook of the sociology of mental health* (pp. 225–253). Boston, Massachusetts: Springer, US. https://doi.org/10.1007/0-387-36223-1_12

VanderWeele, T. (2015). *Explanation in causal inference: Methods for mediation and interaction*. University Press.

Vlachantoni, A., Evandrou, M., Falkingham, J., & Gomez-Leon, M. (2020). Caught in the middle in midlife: Provision of care across multiple generations. *Ageing & Society, 40*(7), 1490–1510. https://doi.org/10.1017/S0144686X19000047

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). MIT Press.

Wrzus, C., Hänel, M., Wagner, J., & Neyer, F. J. (2013). Social network changes and life events across the life span: A meta-analysis. *Psychological Bulletin, 139*(1), 53–80. https://doi.org/10.1037/a0028601

Yu, Q., Zhang, J., Zhang, L., Zhang, Q., Guo, Y., Jin, S., & Chen, J. (2019). Who gains more? The relationship between parenthood and well-being. *Evolutionary Psychology, 17*(3), 147470491986046. https://doi.org/10.1177/1474704919860467